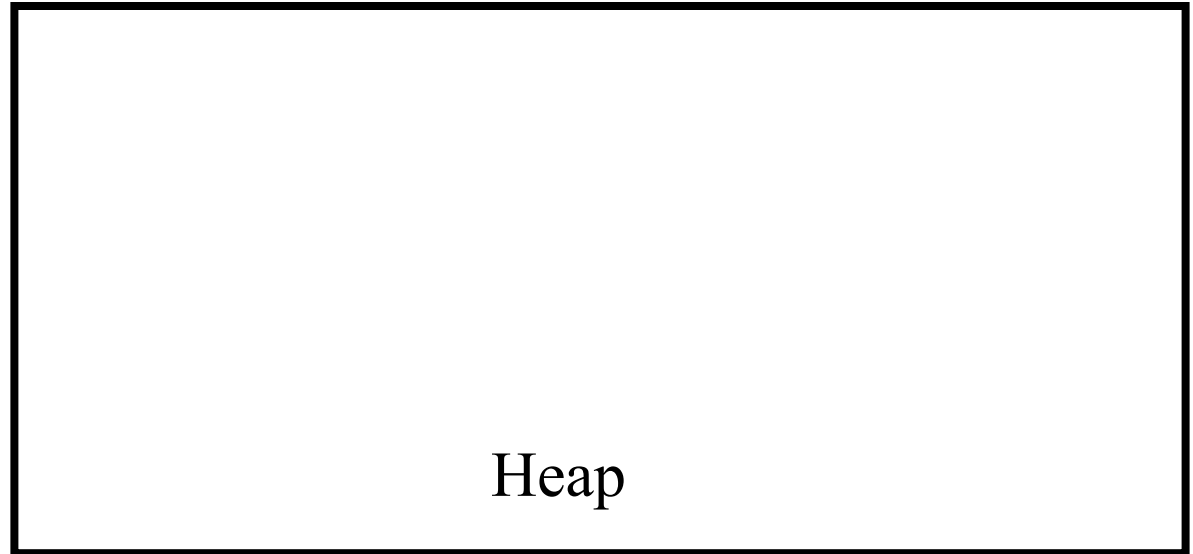
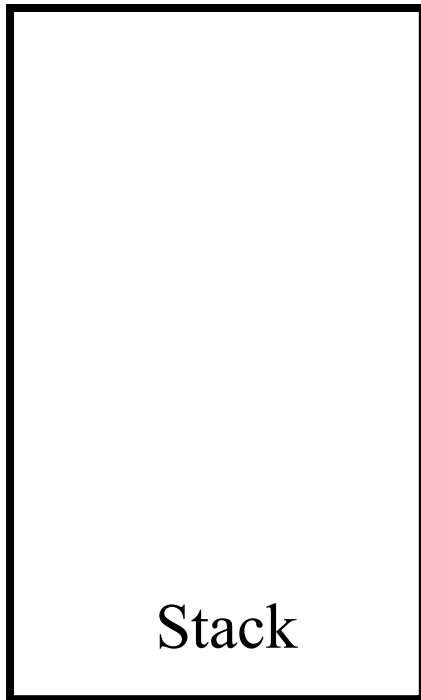


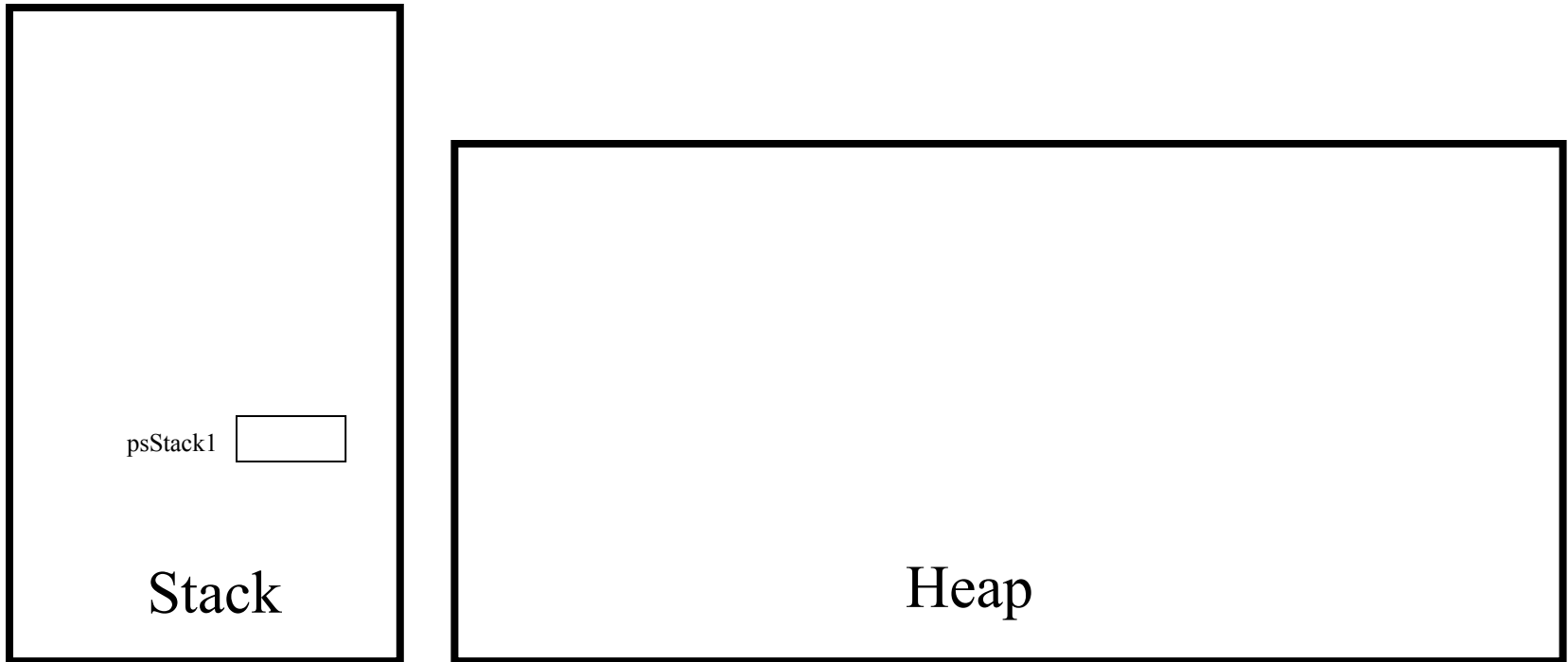
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Trace of teststack (Version 1)

```
int main(void)
```



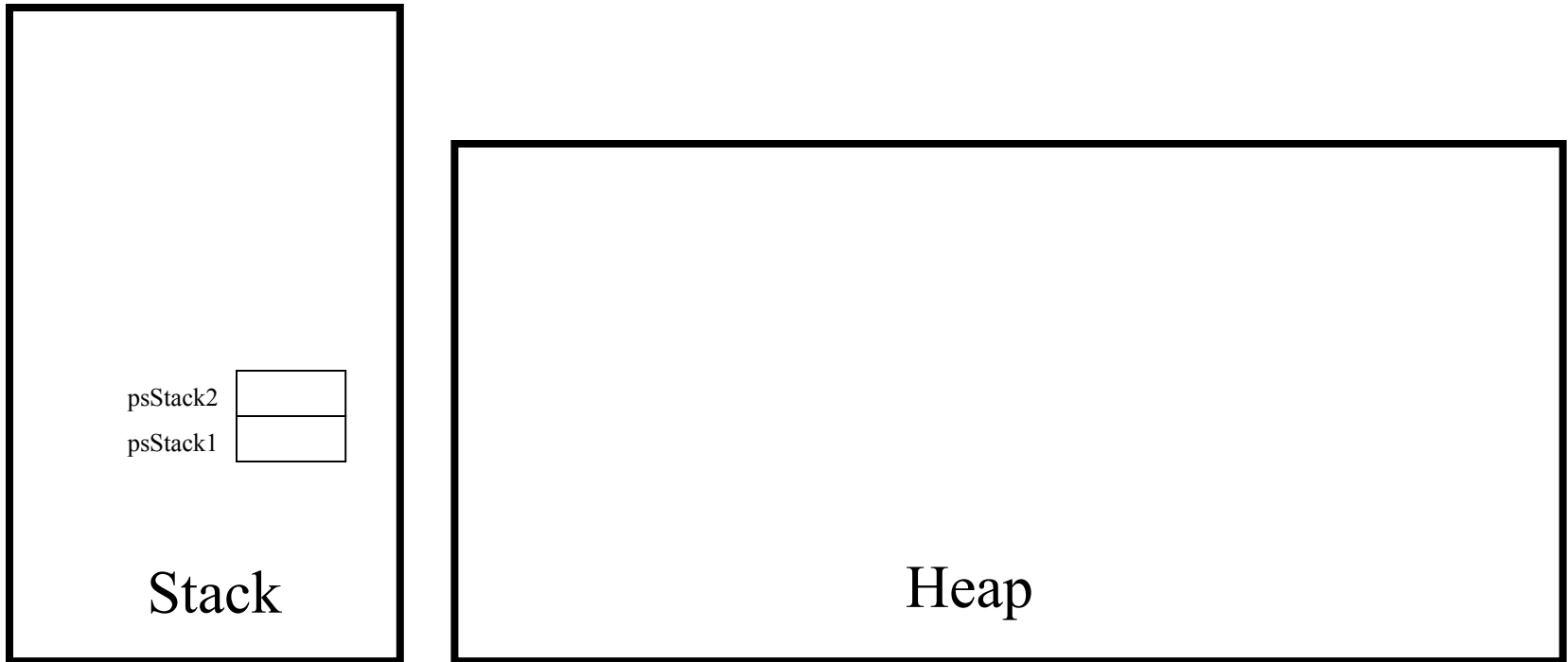
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```
struct Stack *psStack1;
```



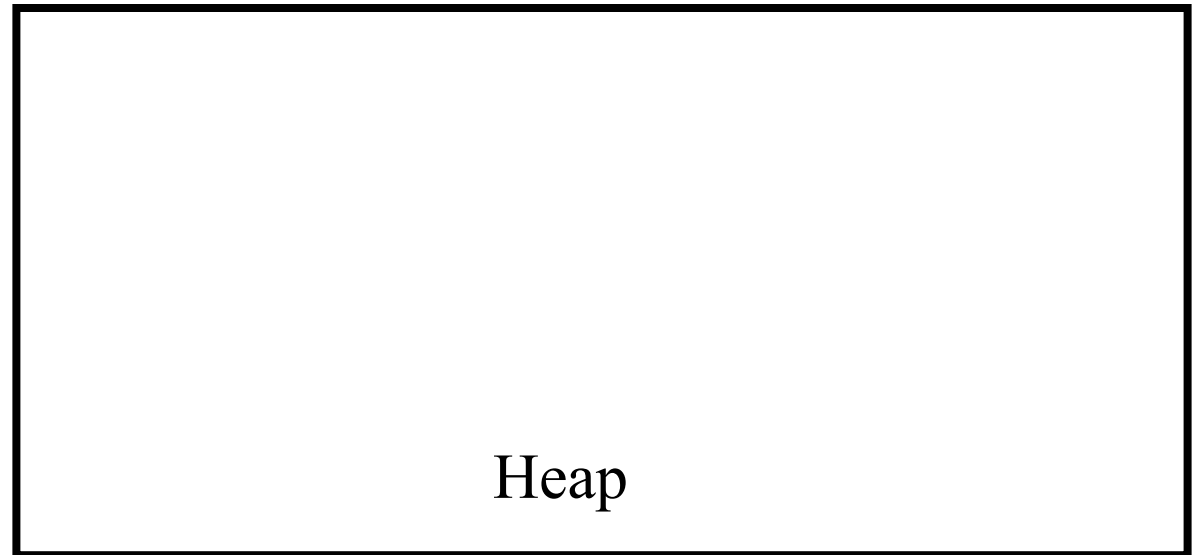
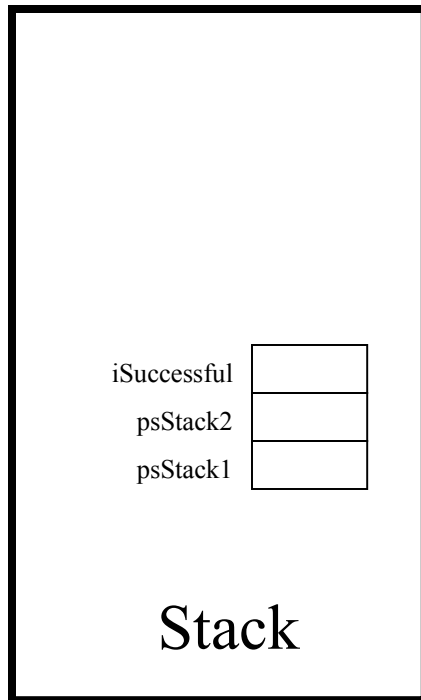
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```
struct Stack *psStack2;
```



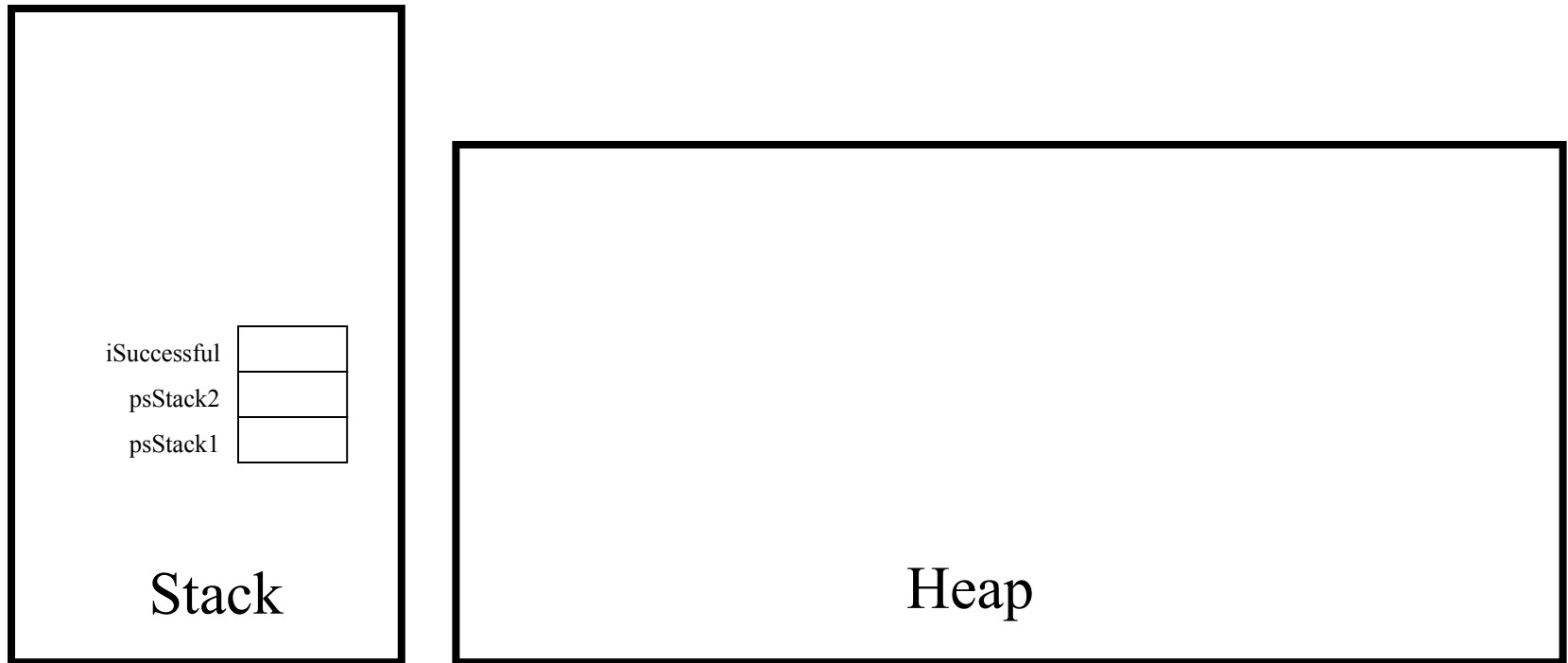
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```
int iSuccessful;
```



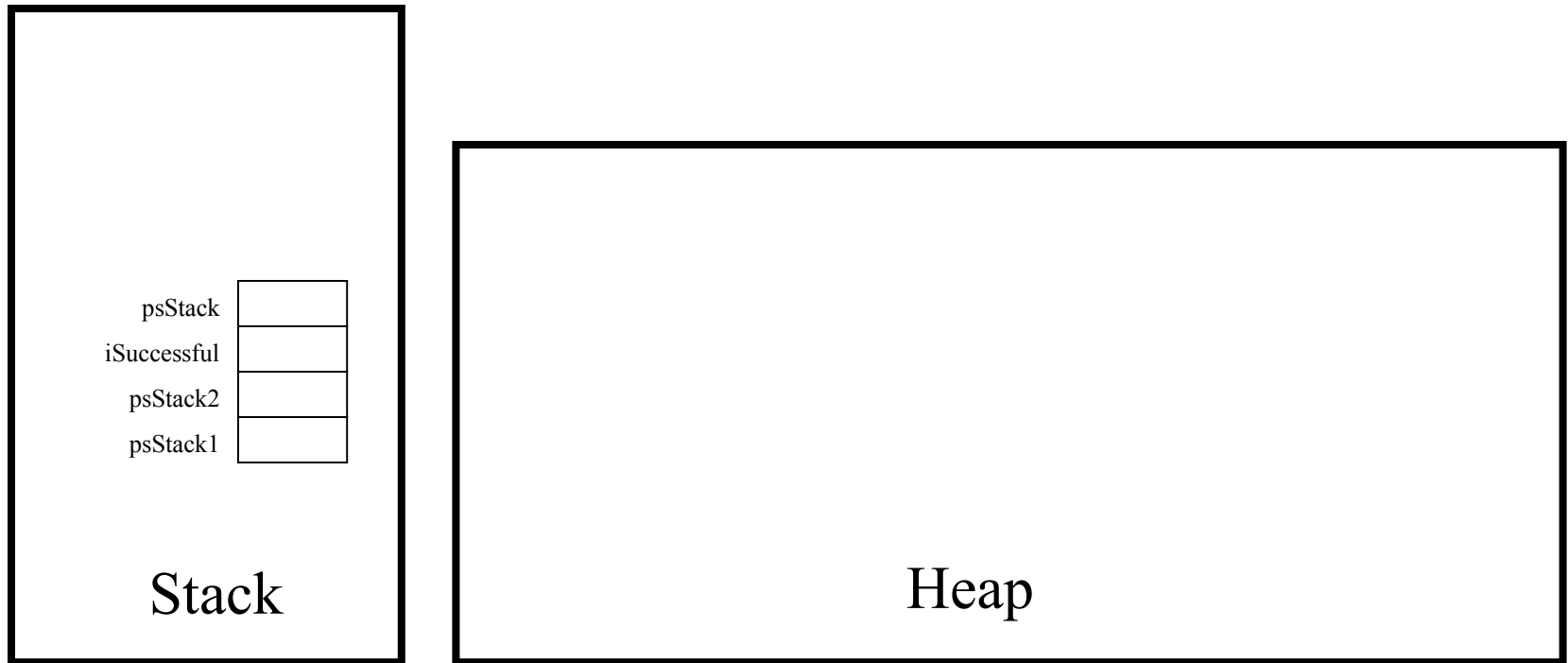
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```
psStack1 = Stack_new();
```



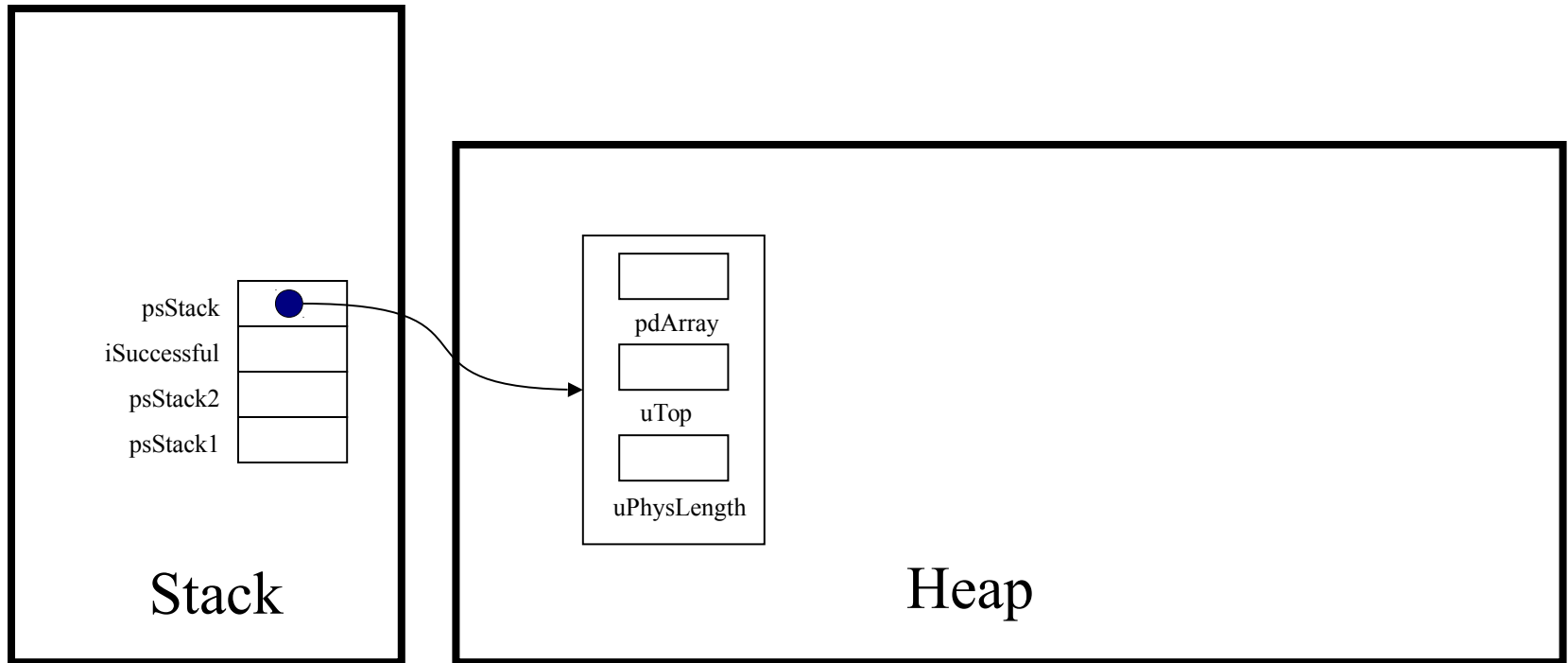
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```
struct Stack *psStack;
```



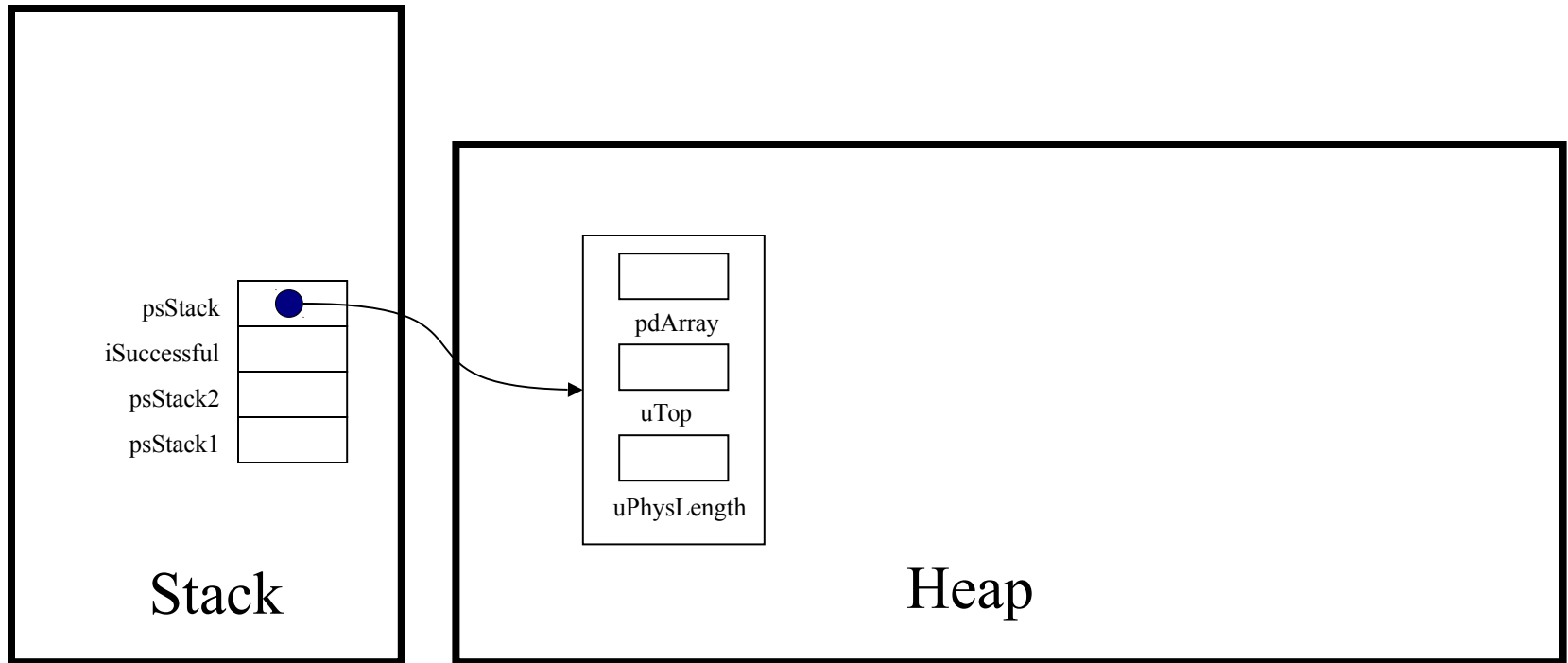
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```
psStack = (struct Stack*)malloc(sizeof(struct Stack));
```



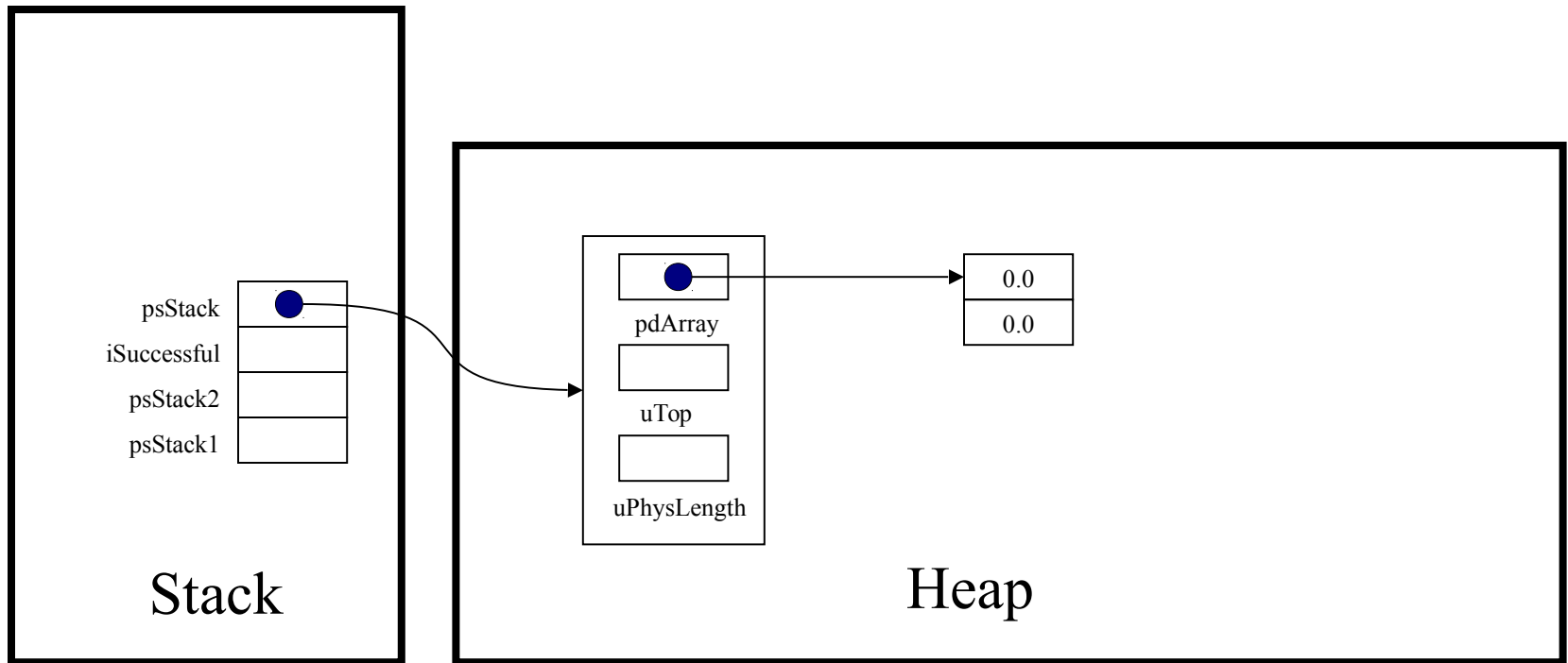
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```
if (psStack == NULL)
    return NULL;
```



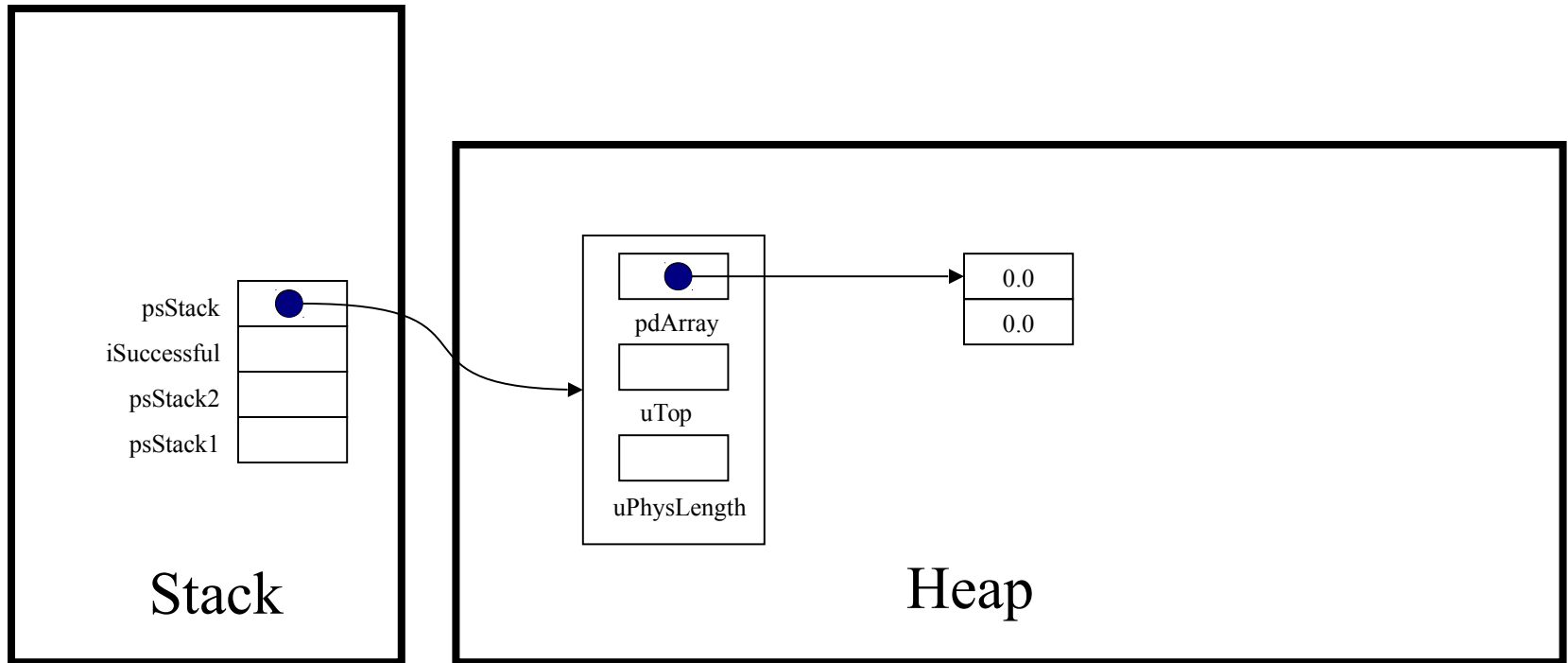
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```
psStack->pdArray = (double*)calloc(INITIAL_PHYS_LENGTH, sizeof(double));
```



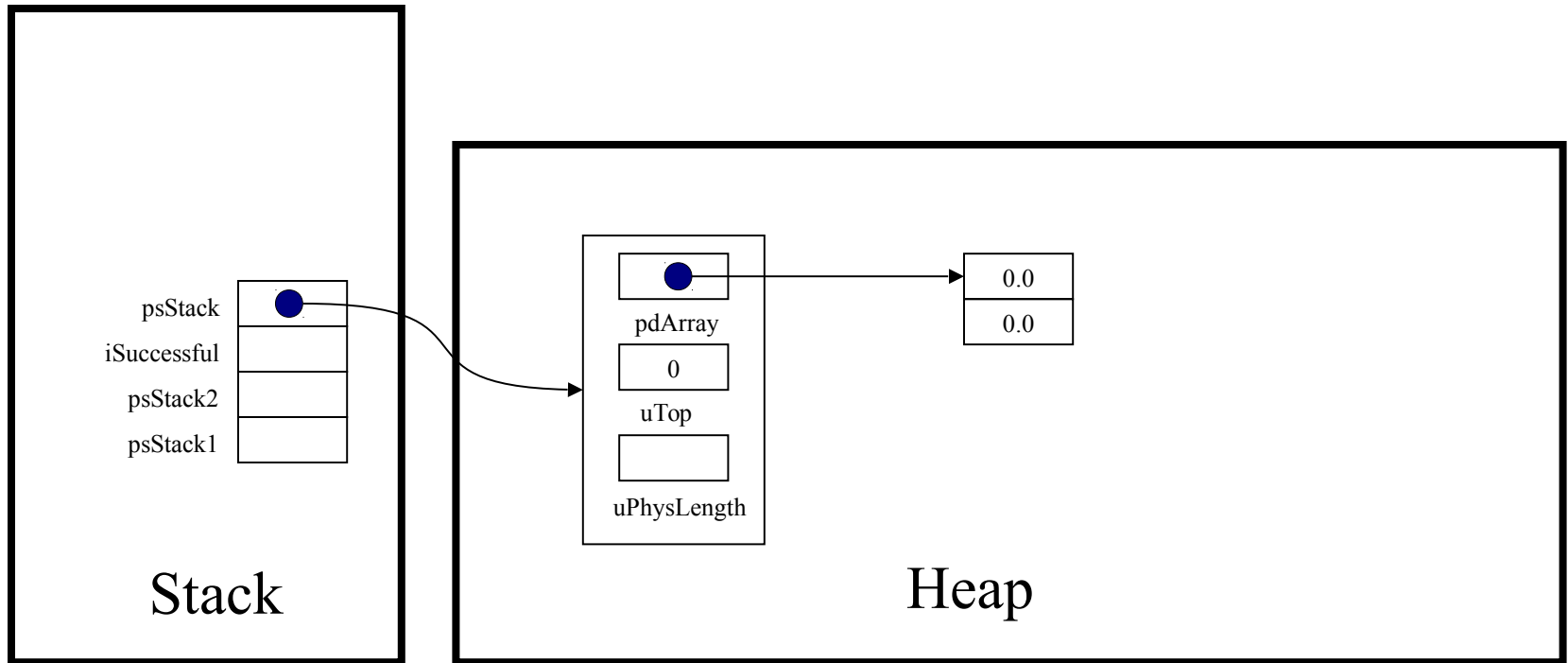
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```
if (psStack->pdArray == NULL)  
...
```



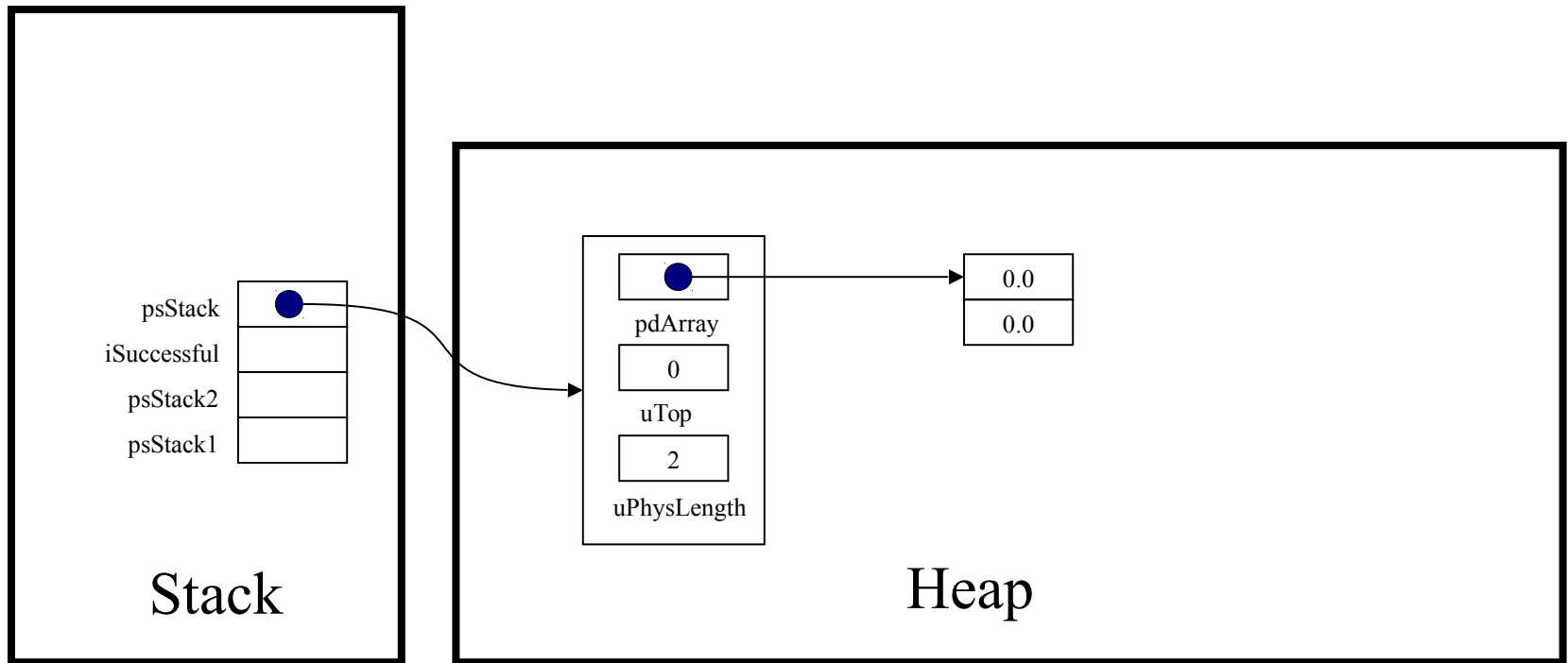
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```
psStack->uTop = 0;
```



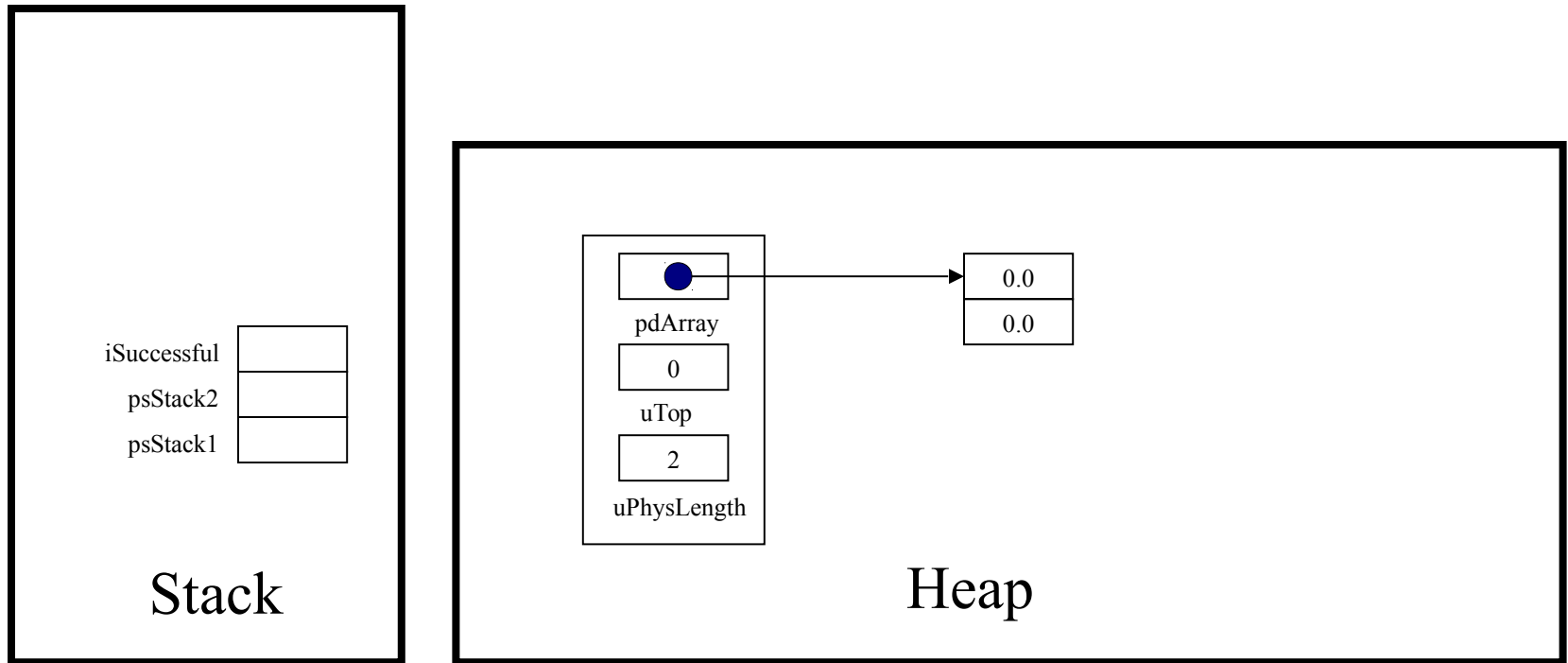
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```
psStack->uPhysLength = INITIAL_PHYS_LENGTH;
```



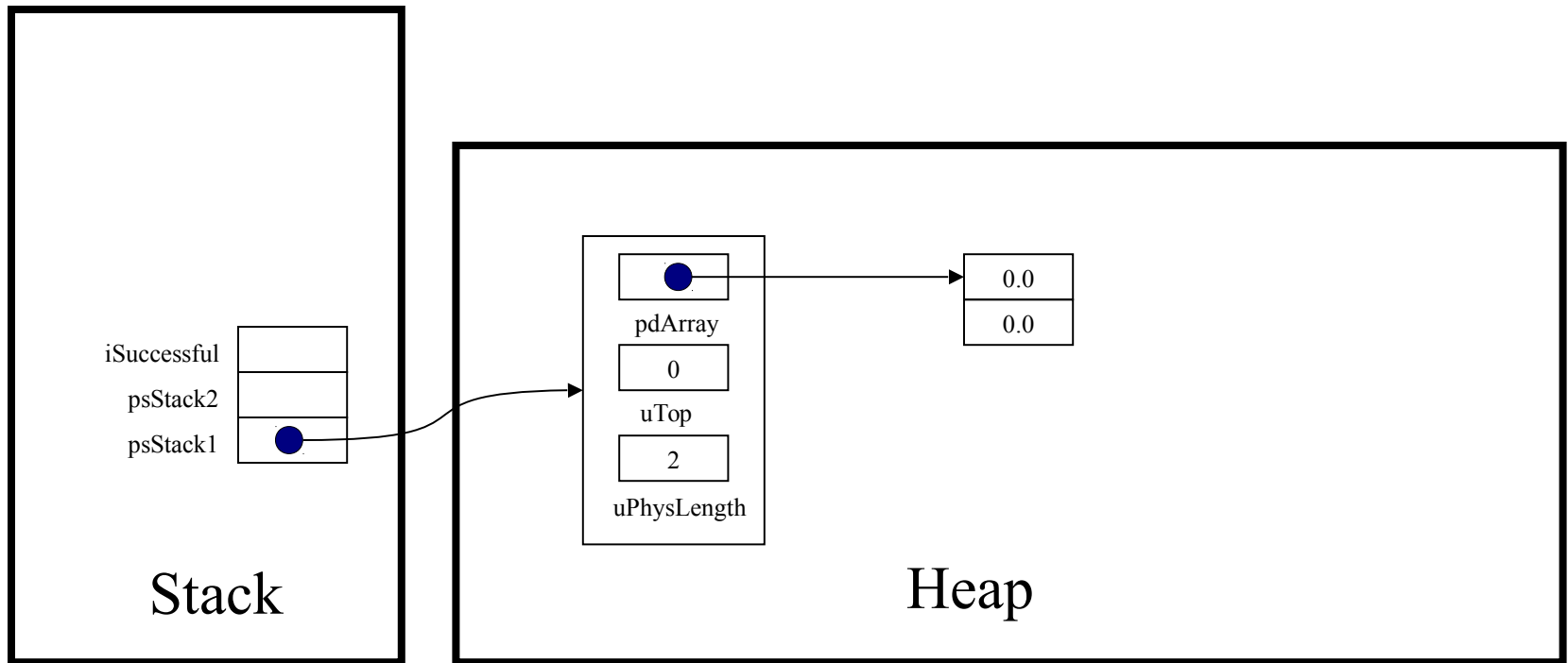
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```
return psStack;
```



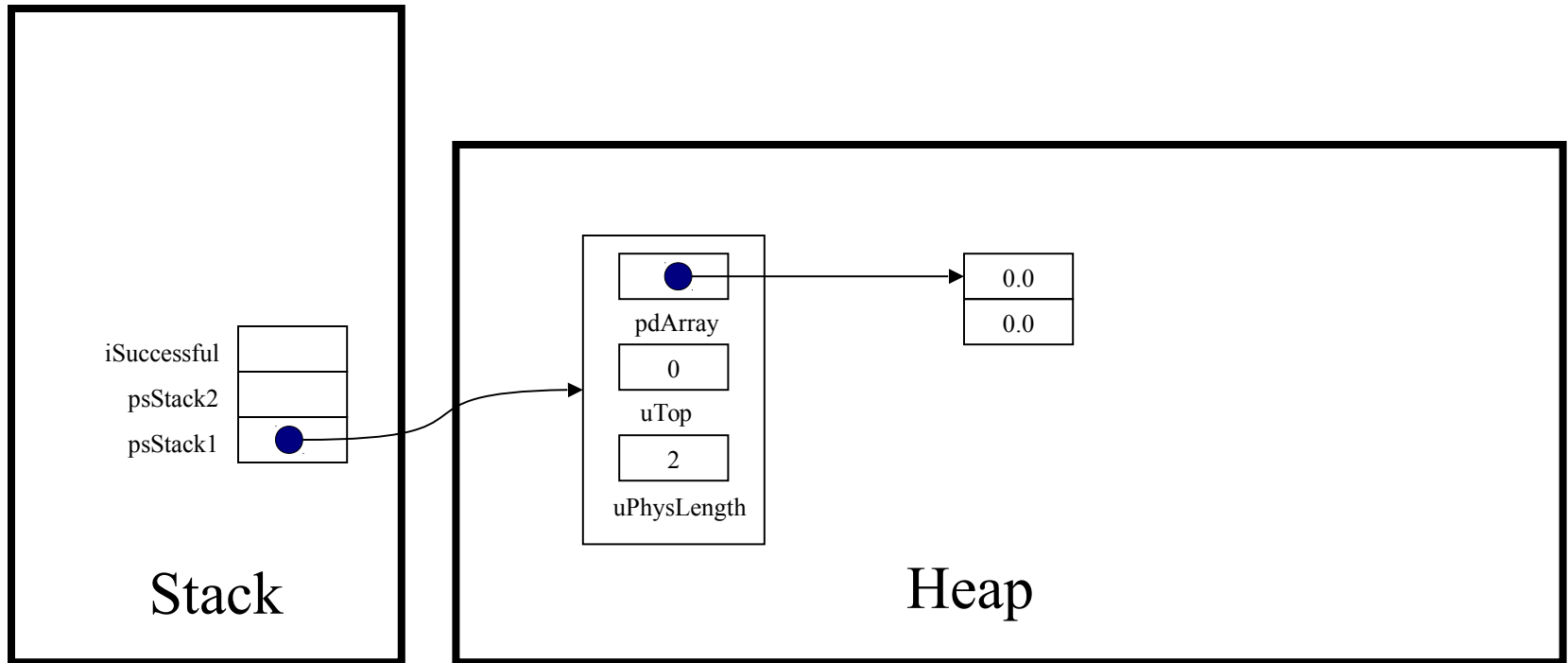
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Trace of teststack (Version 1)

```
psStack1 = Stack_new();
```



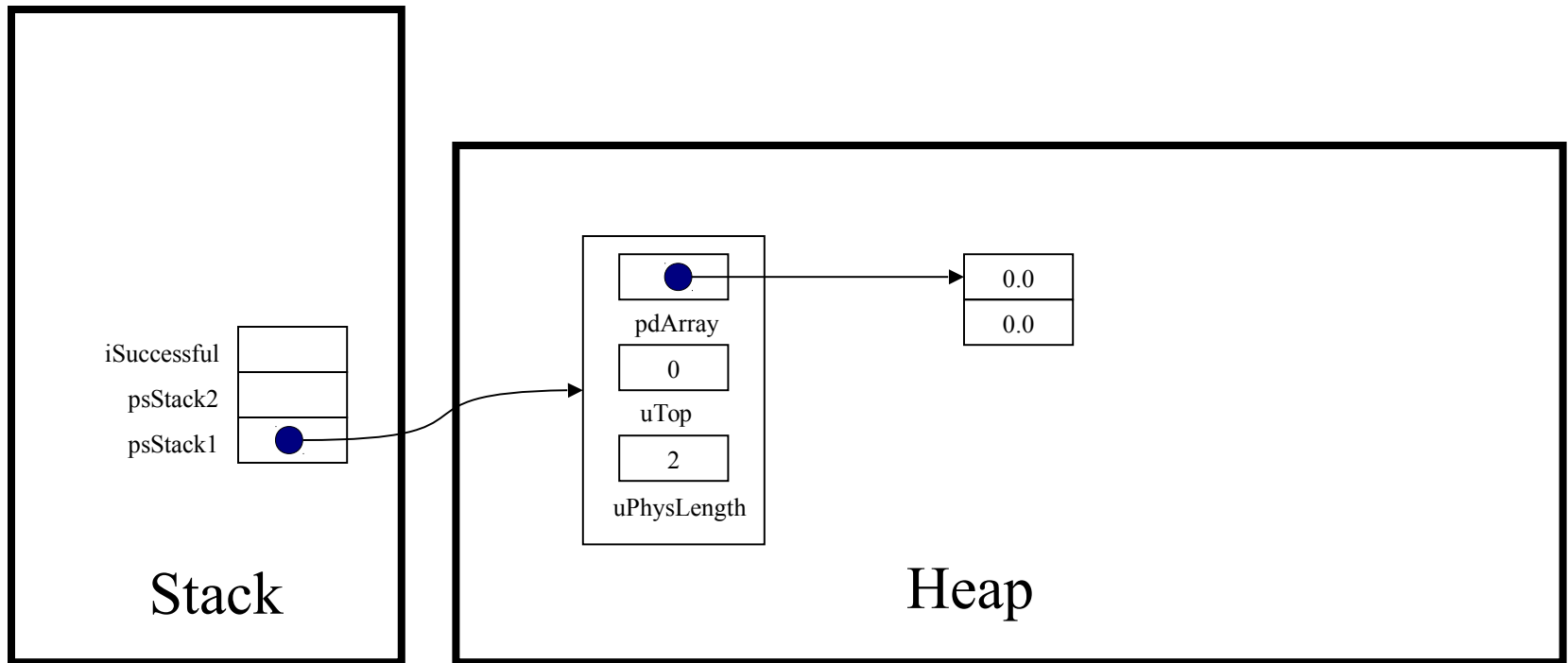
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Trace of teststack (Version 1)

```
if (psStack1 == NULL) handleMemoryError();
```



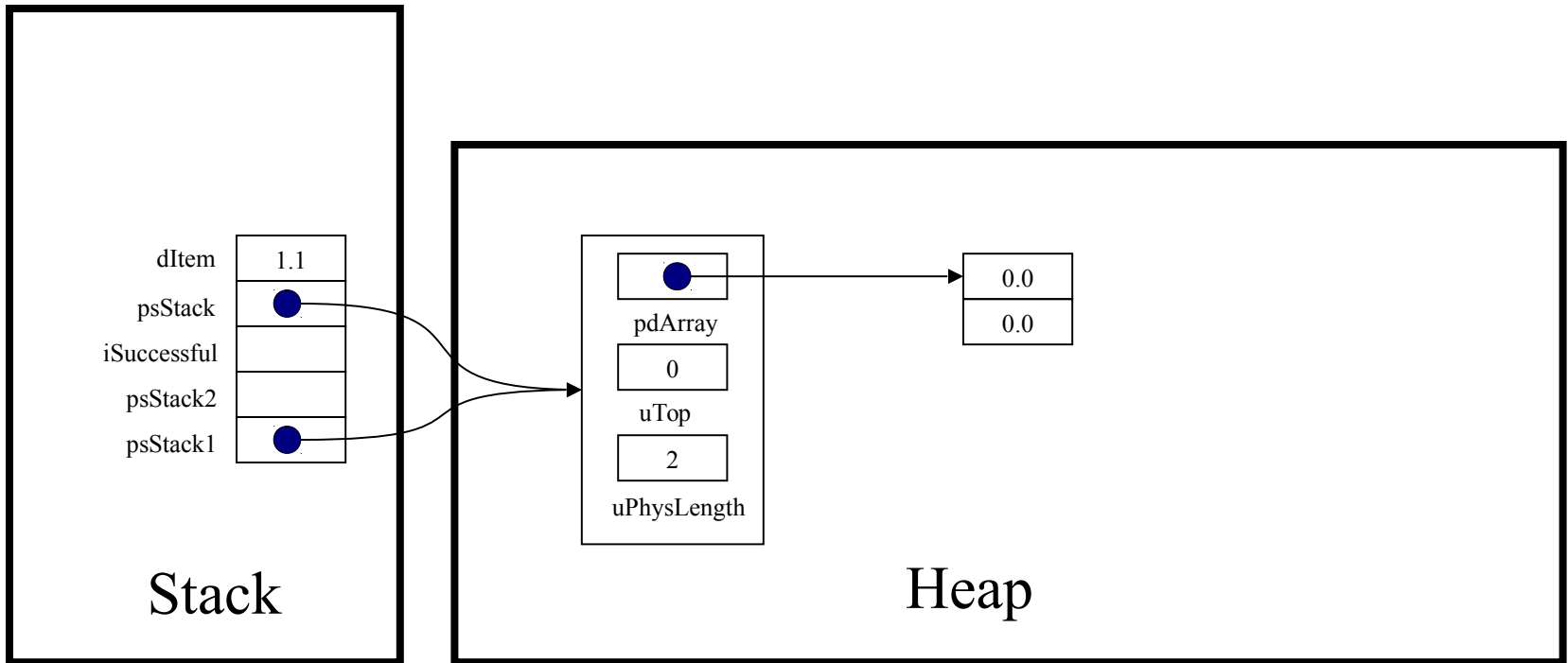
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Trace of teststack (Version 1)

```
iSuccessful = Stack_push(psStack1, 1.1);
```



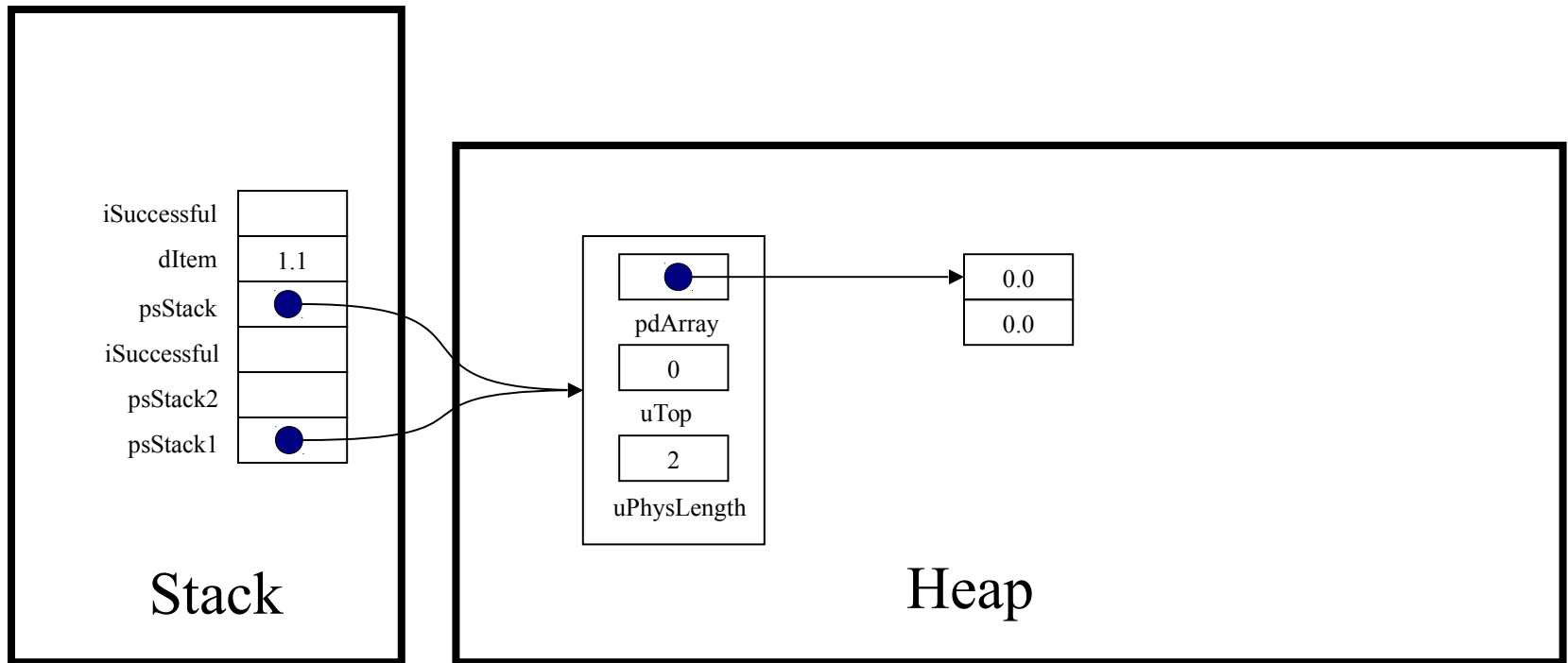
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Trace of teststack (Version 1)

```
int Stack_push(struct Stack *psStack, double dItem)
```



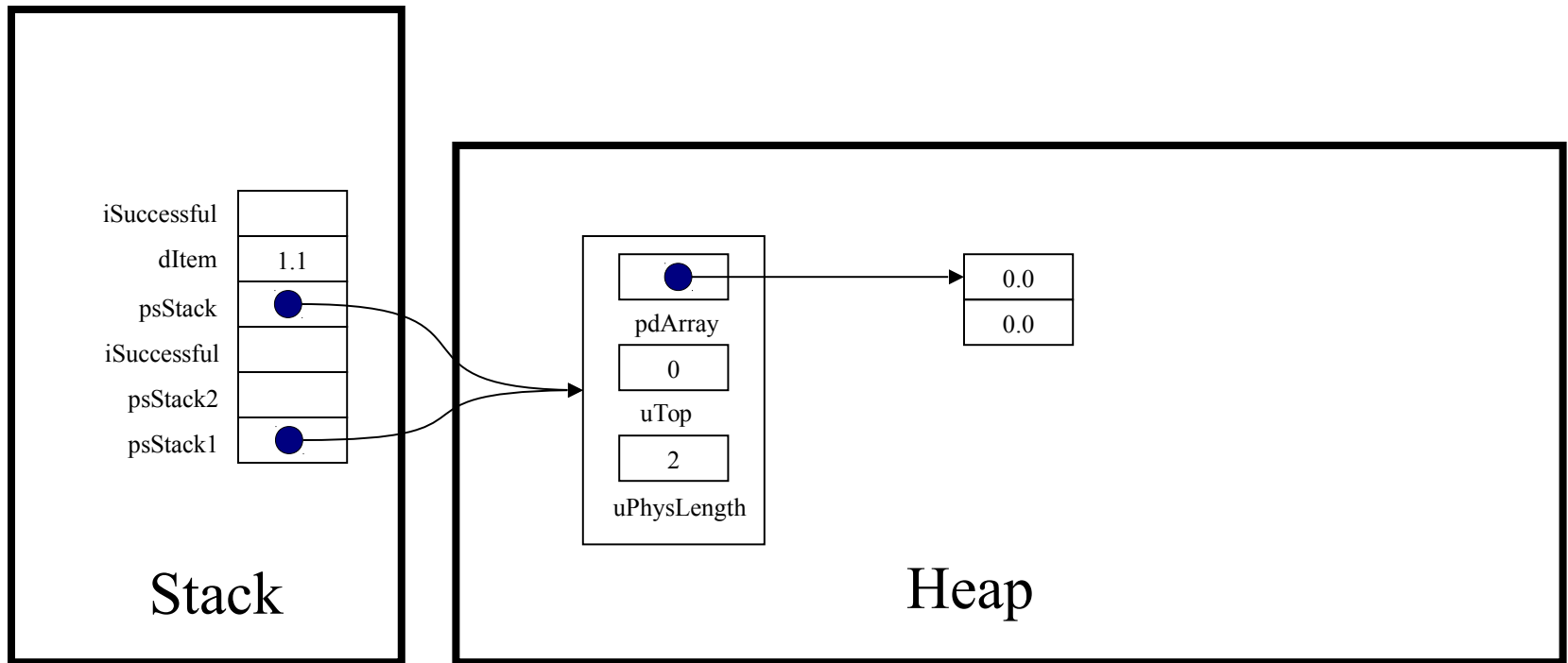
Princeton University
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Trace of teststack (Version 1)

```
int iSuccessful;
```



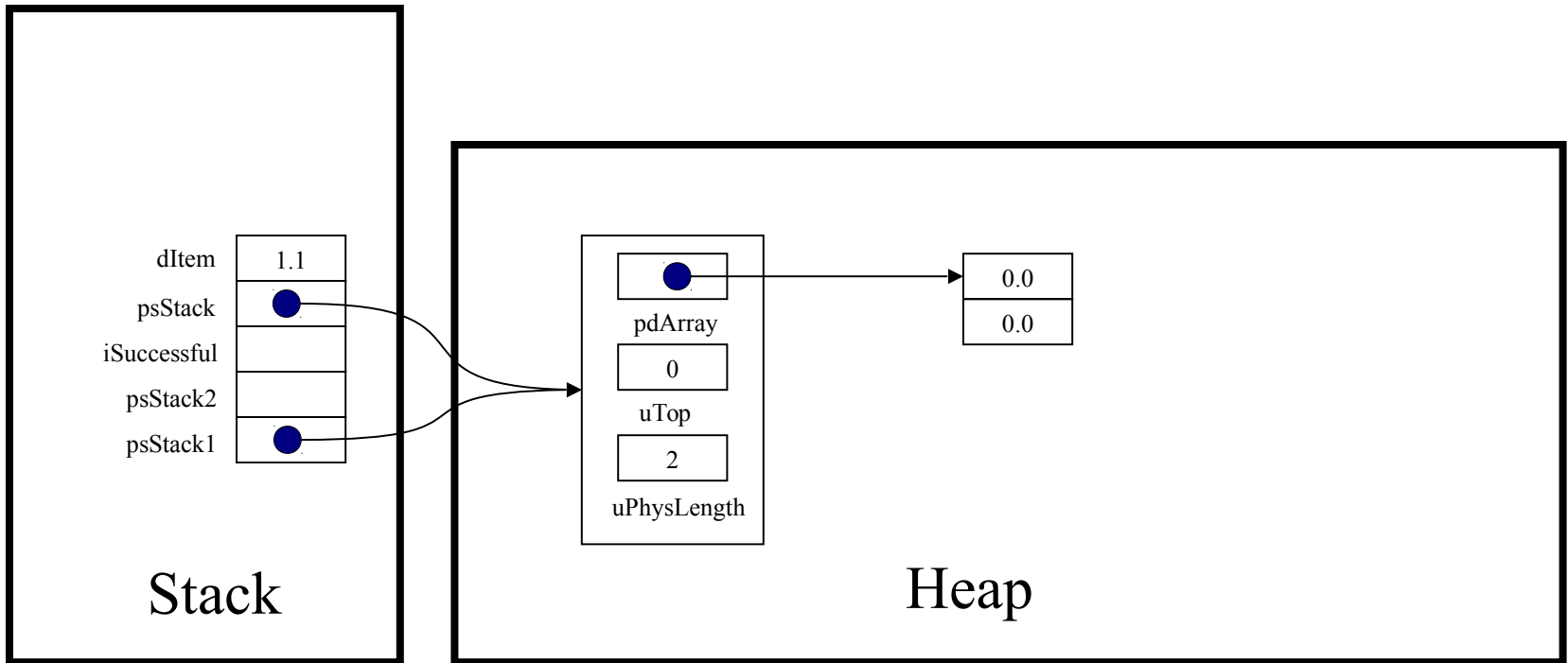
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```
assert (psStack != NULL);
```



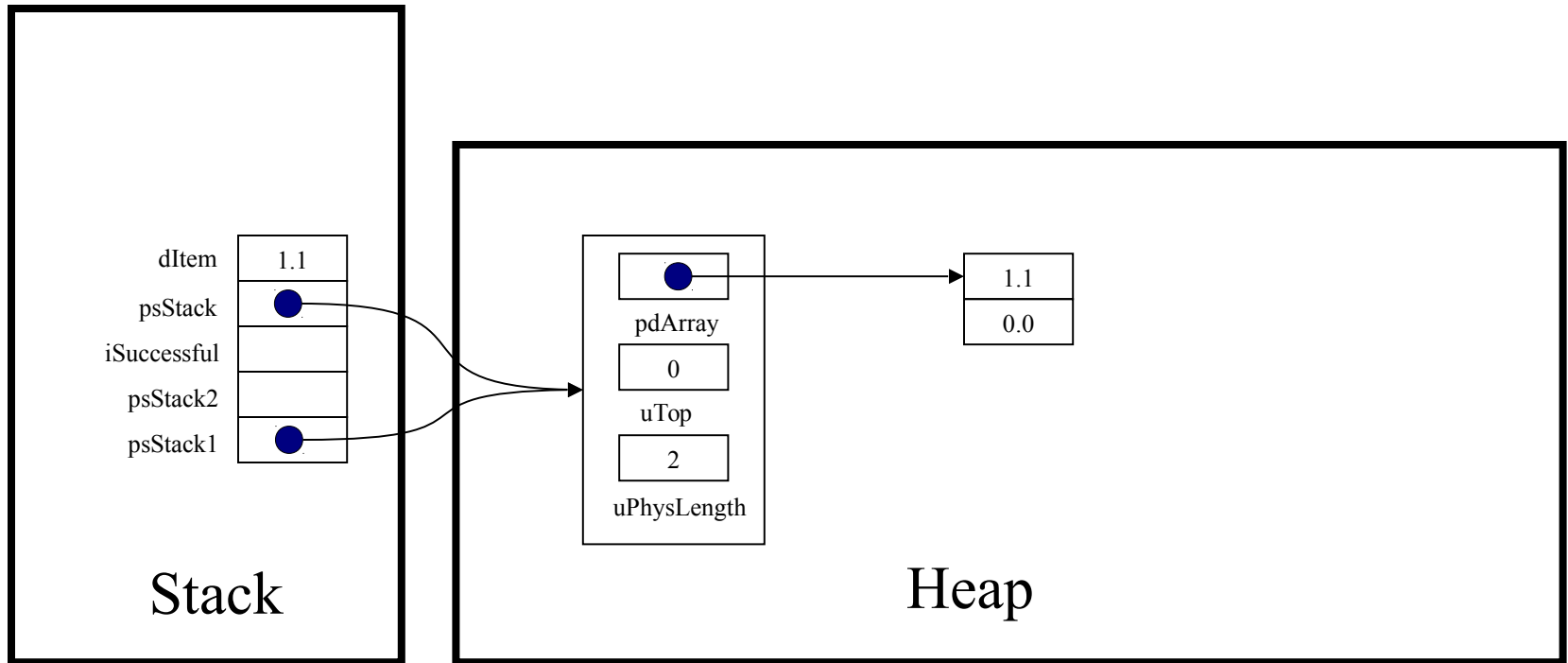
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Trace of teststack (Version 1)

```
if (psStack->uTop == psStack->uPhysLength)  
...
```



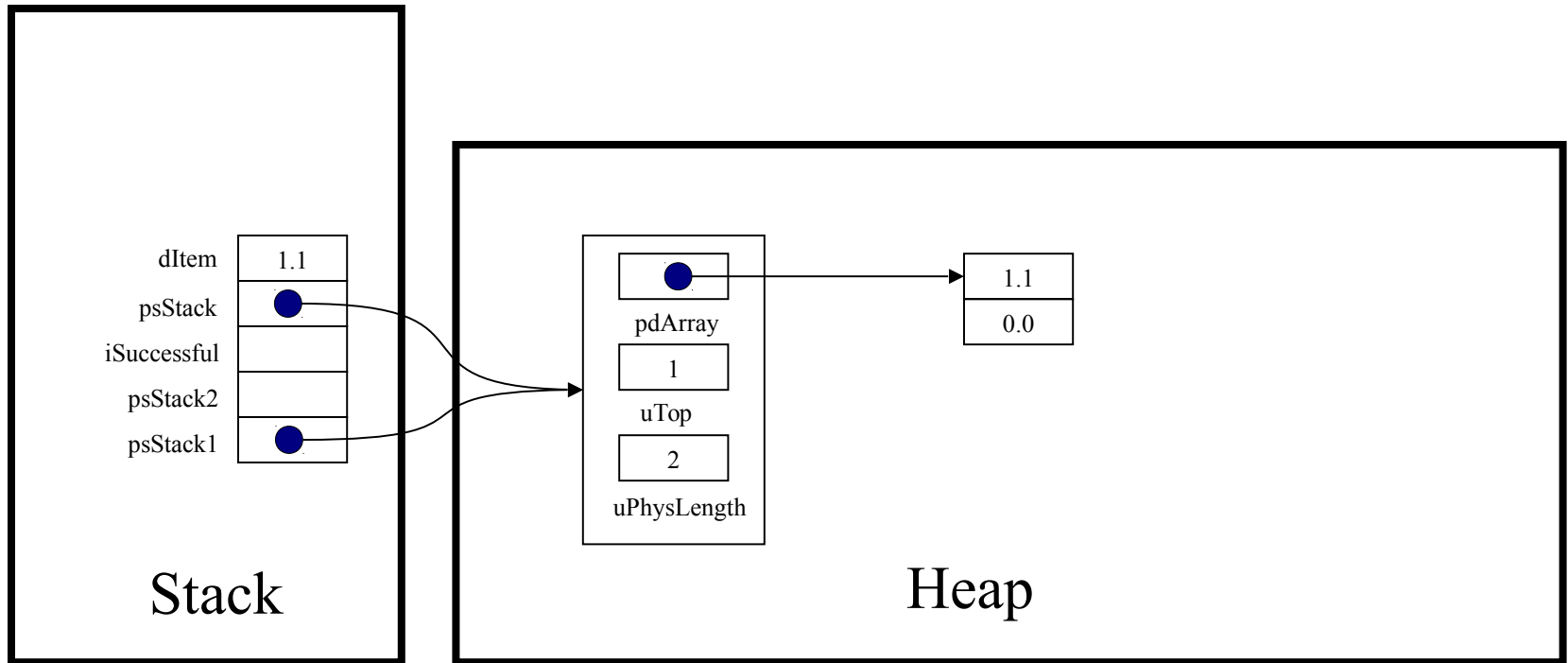
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Trace of teststack (Version 1)

```
(psStack->pdArray)[psStack->uTop] = dItem;
```



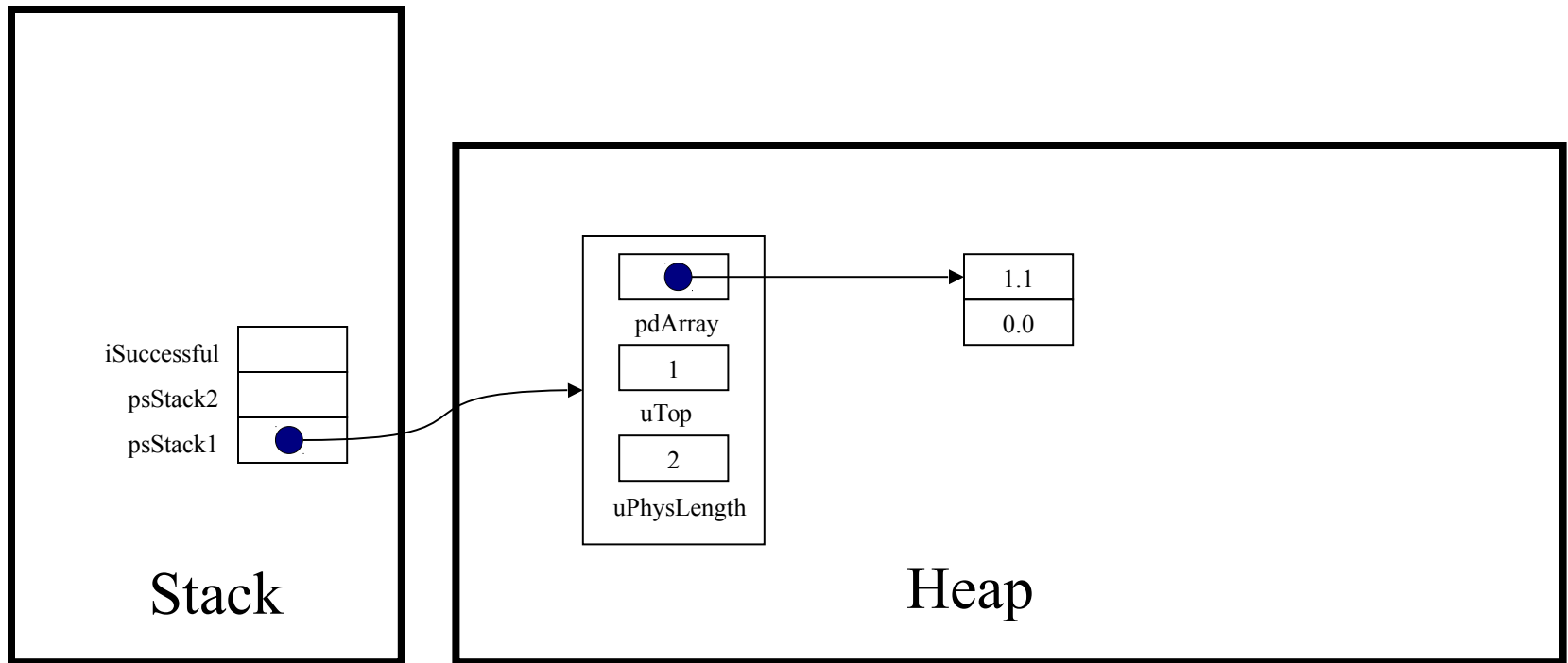
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Trace of teststack (Version 1)

```
(psStack->uTop) ++;
```



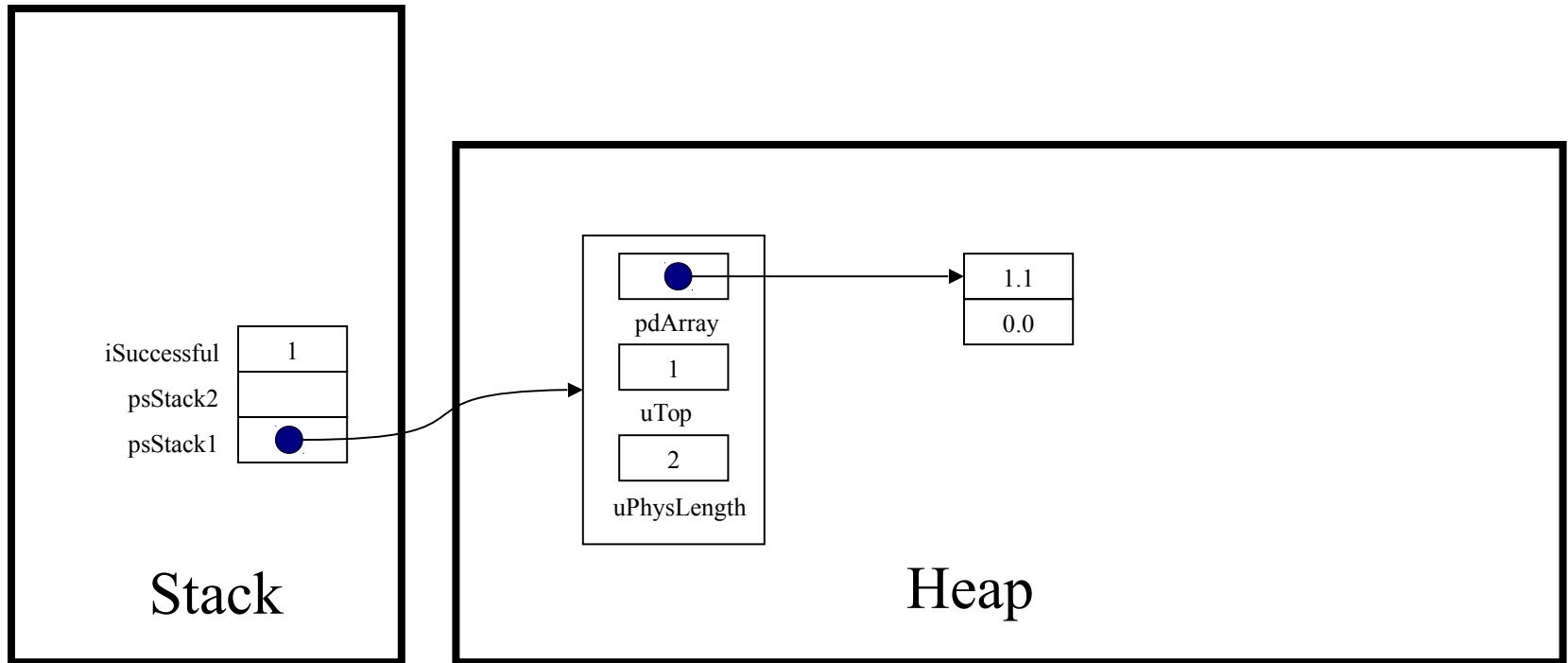
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Trace of teststack (Version 1)

```
return 1;
```



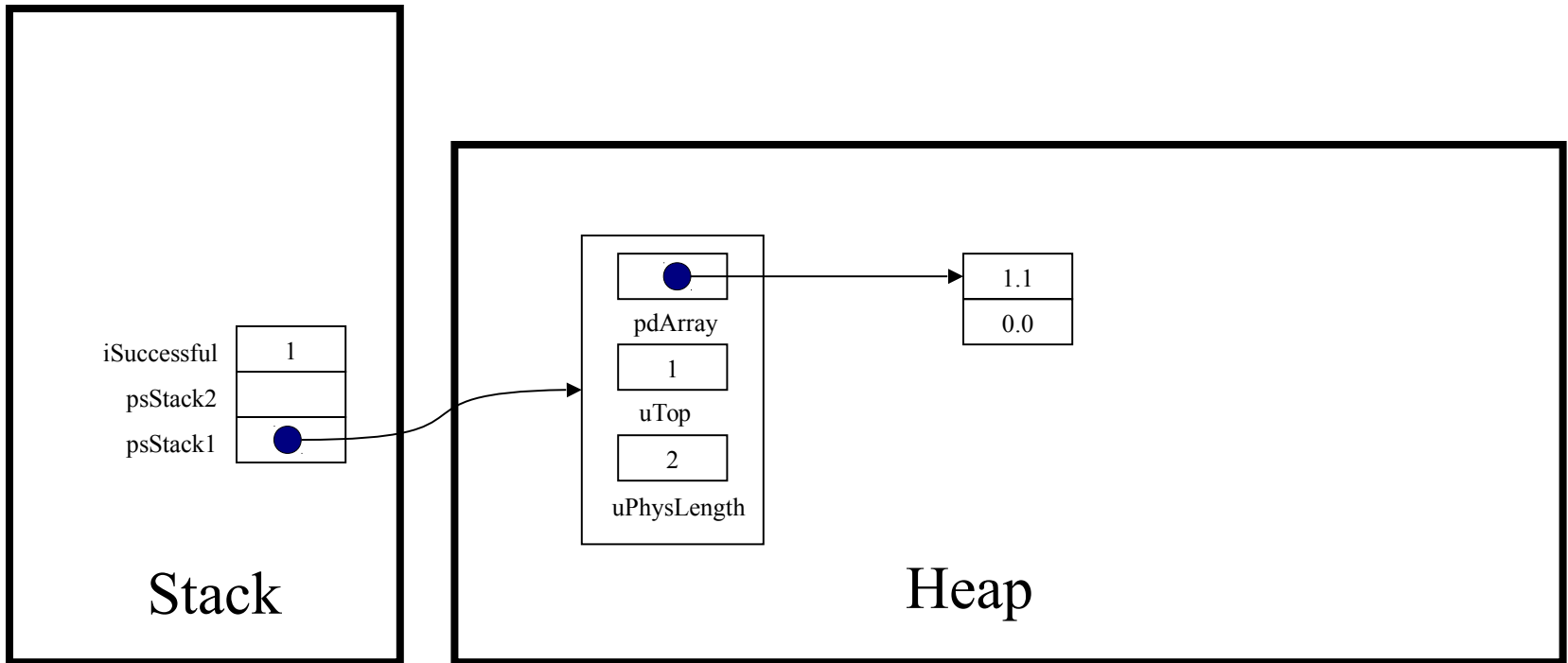
Princeton University
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Trace of teststack (Version 1)

```
iSuccessful = Stack_push(psStack1, 1.1);
```



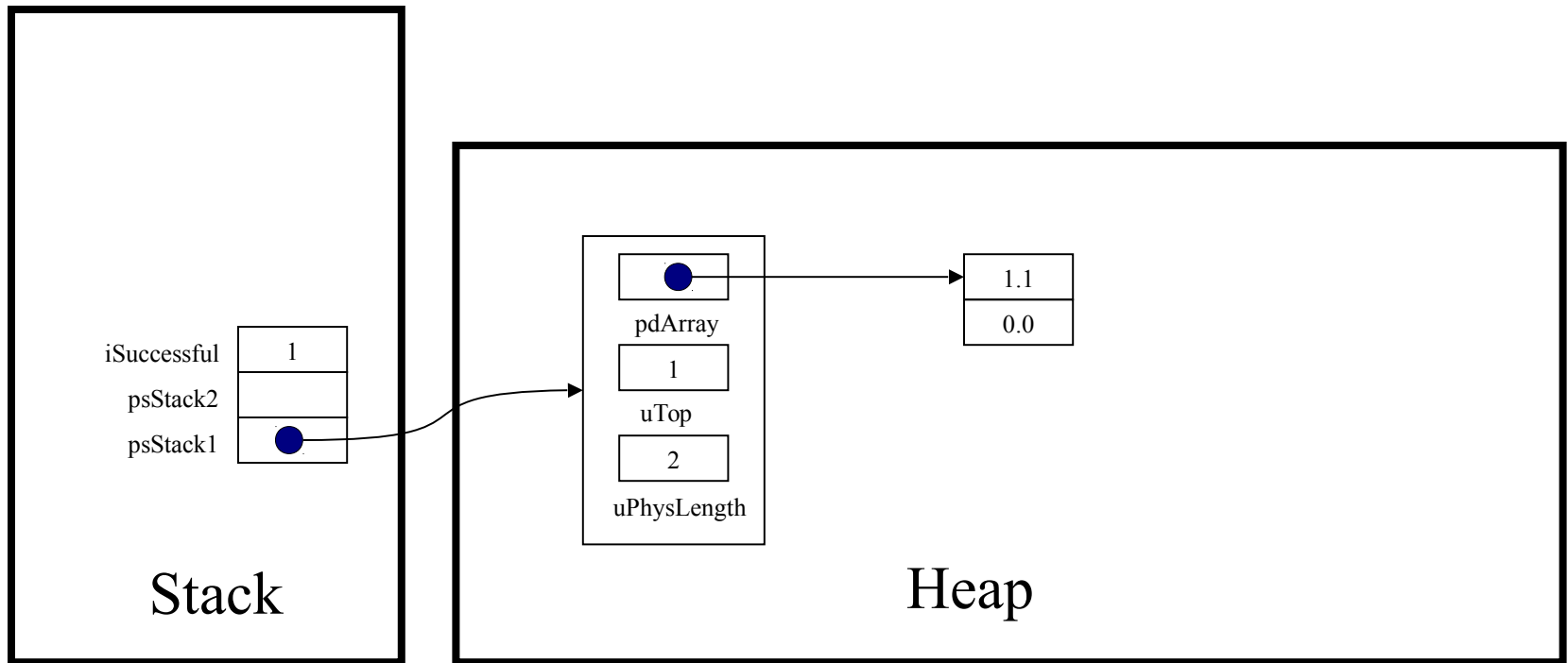
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Trace of teststack (Version 1)

```
if (! iSuccessful) handleMemoryError();
```



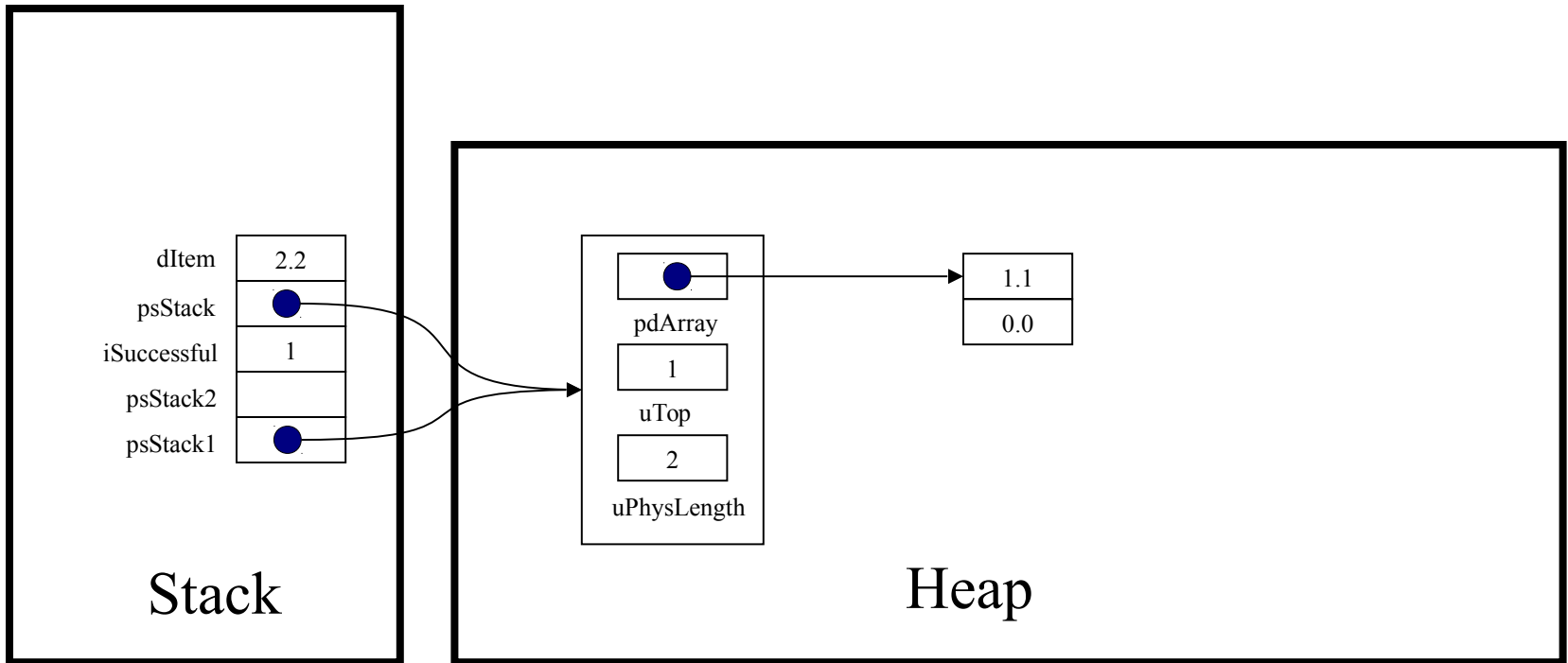
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Trace of teststack (Version 1)

```
iSuccessful = Stack_push(psStack1, 2.2);
```



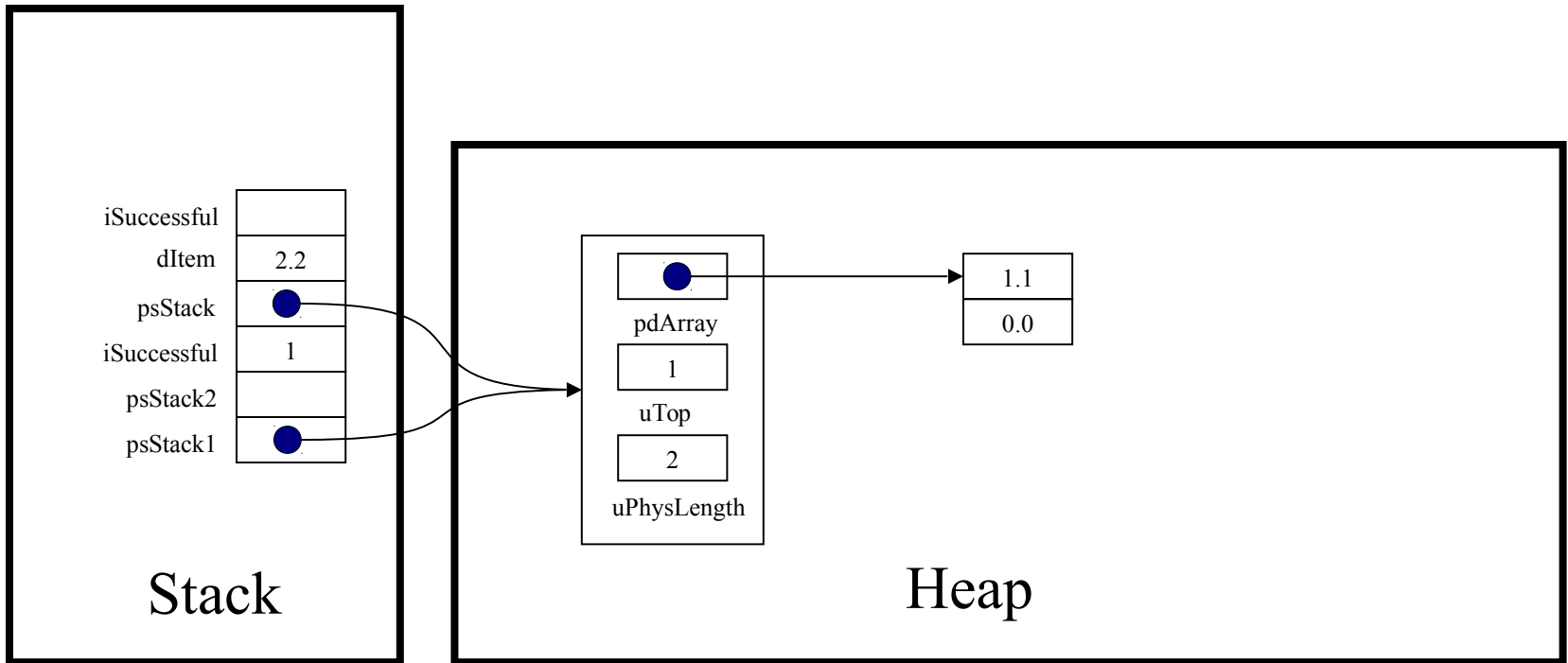
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Trace of teststack (Version 1)

```
int Stack_push(struct Stack *psStack, double dItem)
```



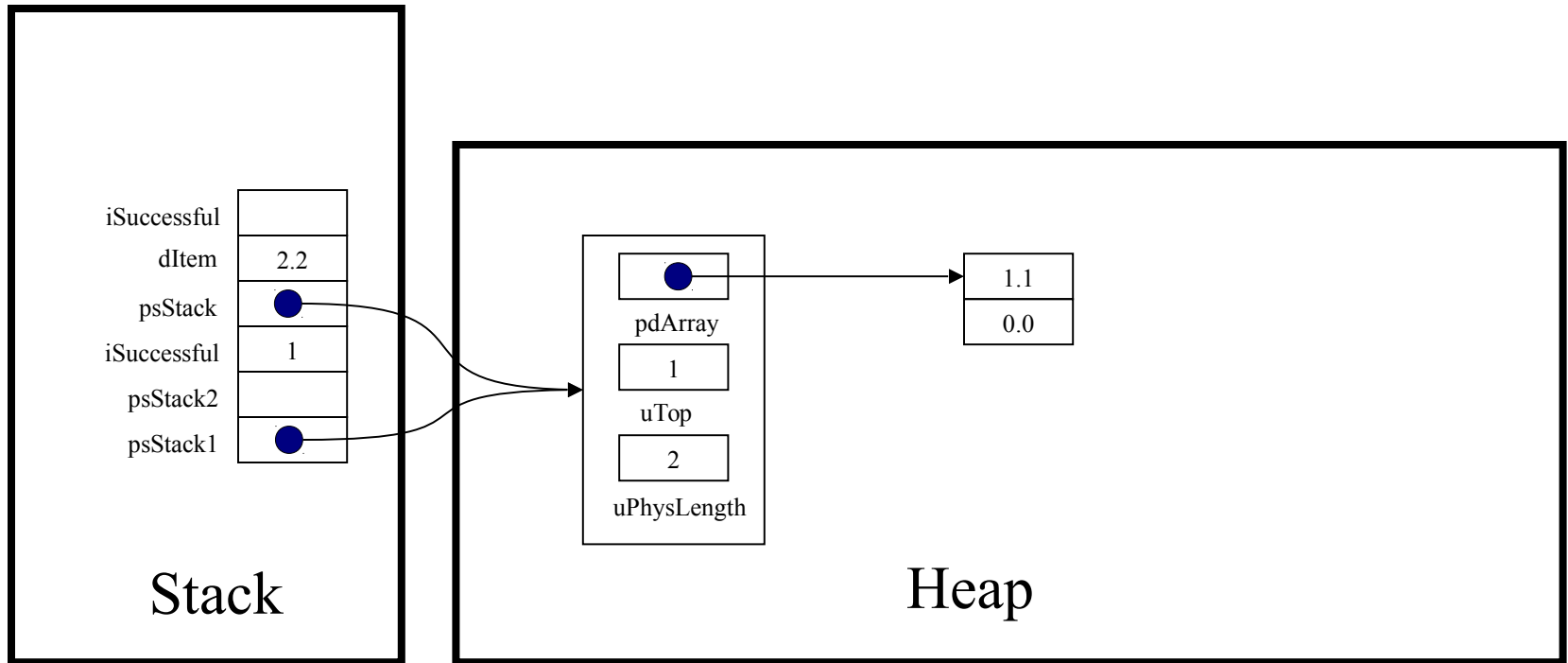
Princeton University
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Trace of teststack (Version 1)

```
int iSuccessful;
```



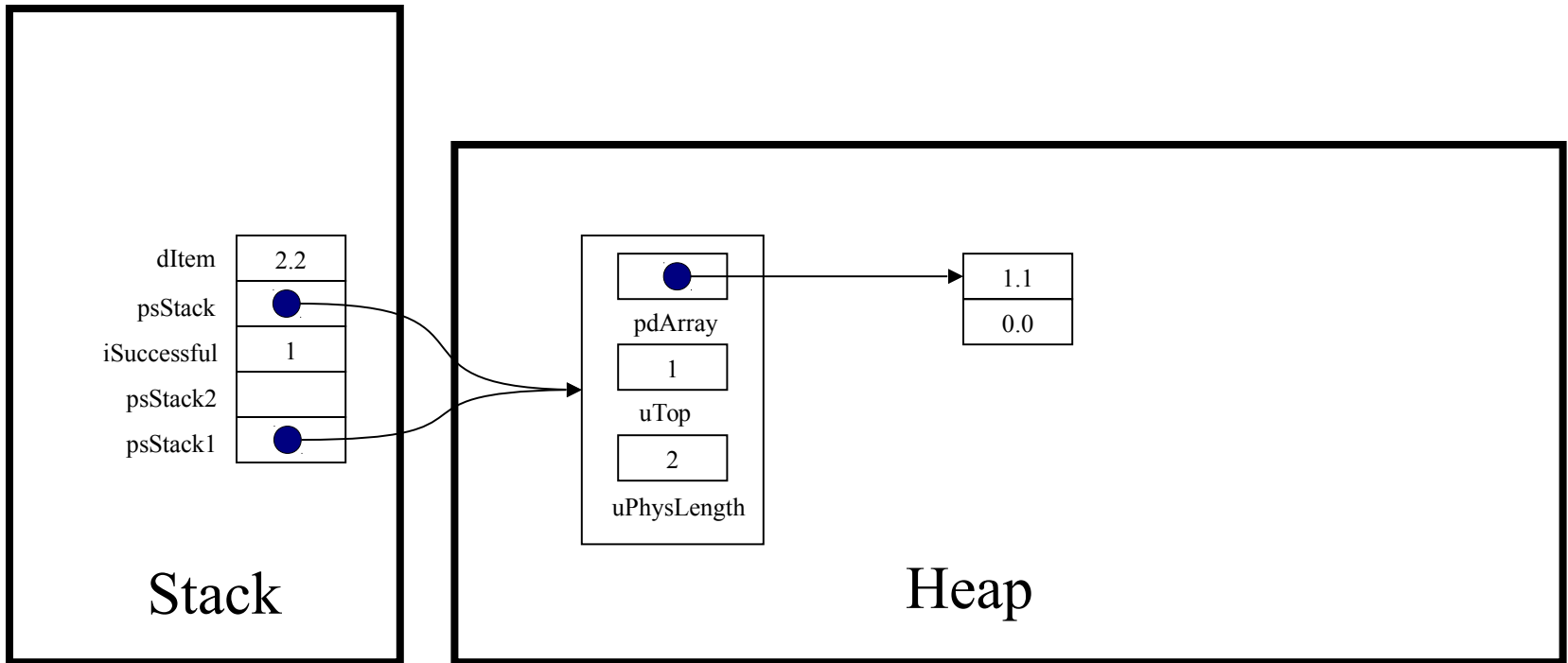
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



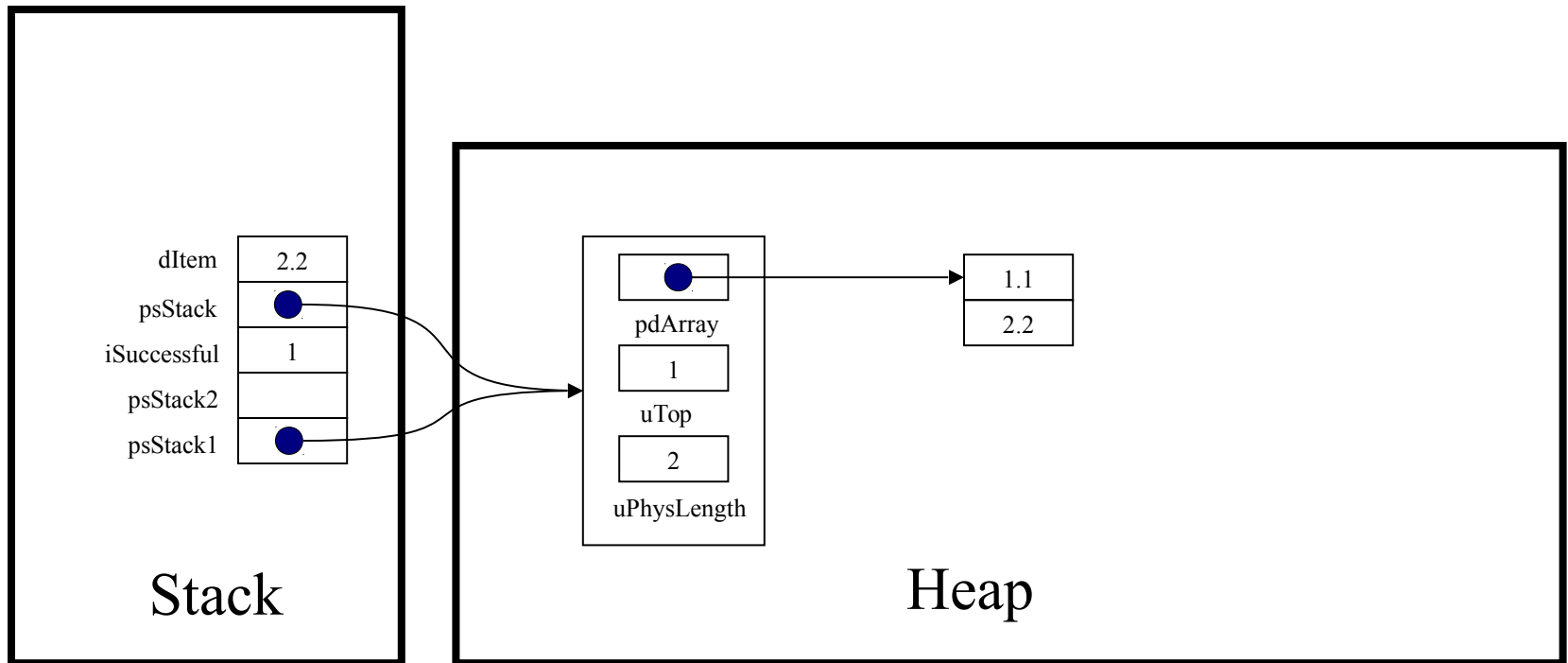
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Trace of teststack (Version 1)

```
if (psStack->uTop == psStack->uPhysLength)  
...
```



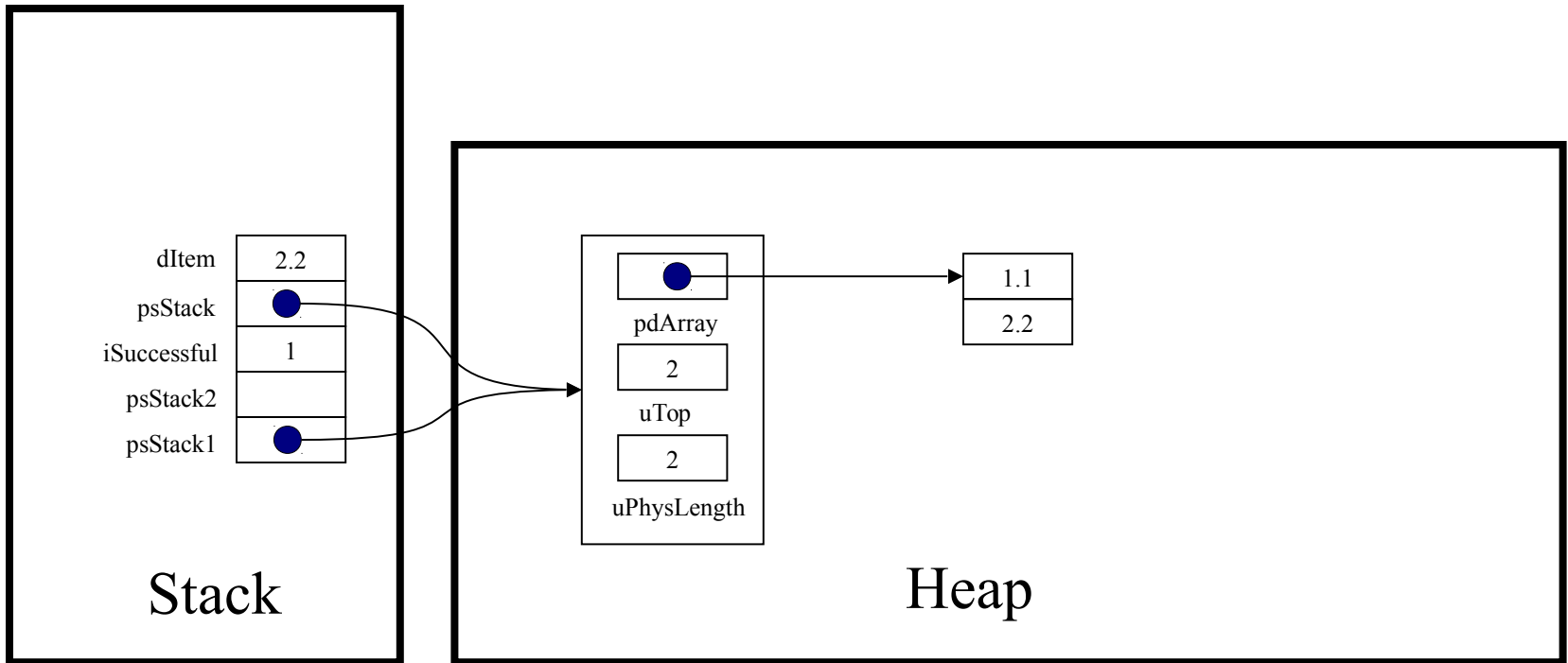
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Trace of teststack (Version 1)

```
(psStack->pdArray)[psStack->uTop] = dItem;
```



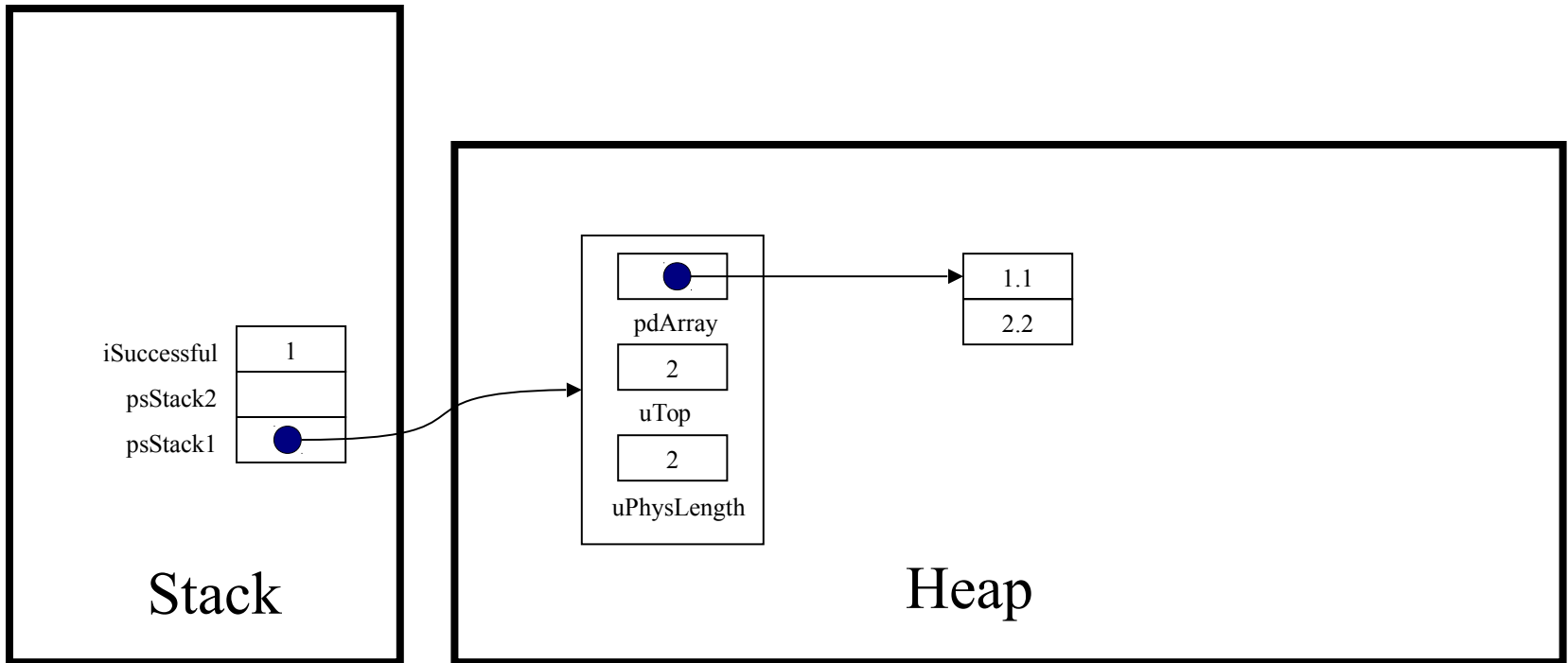
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Trace of teststack (Version 1)

```
(psStack->uTop) ++;
```



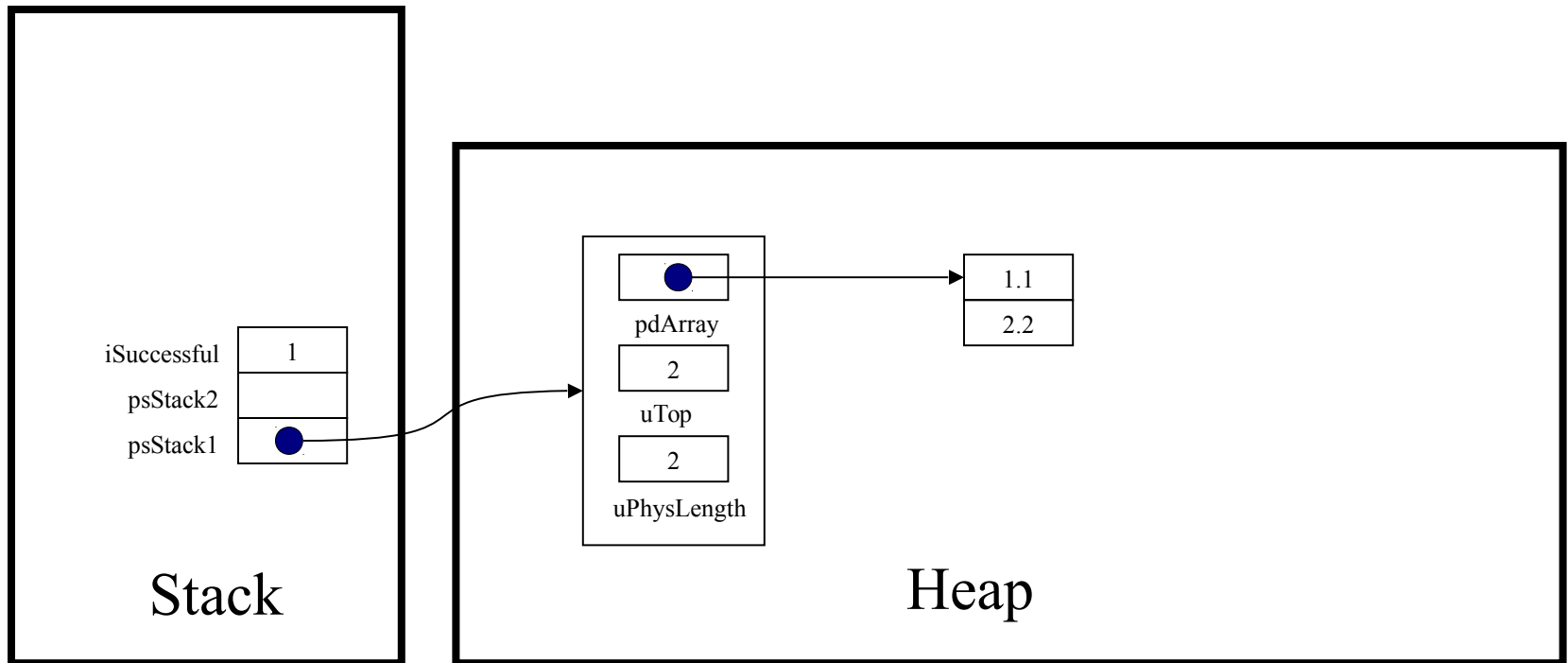
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Trace of teststack (Version 1)

```
return 1;
```



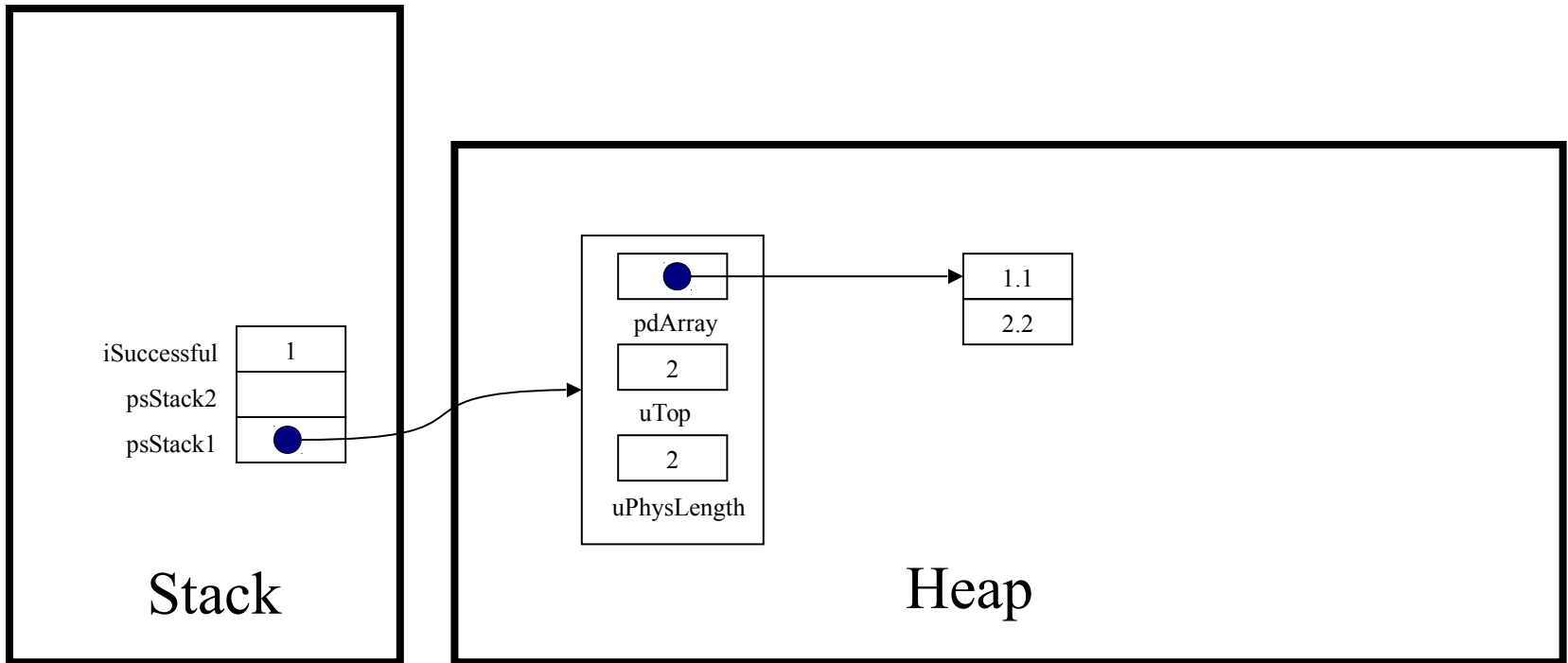
Princeton University
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Trace of teststack (Version 1)

```
iSuccessful = Stack_push(psStack1, 2.2);
```



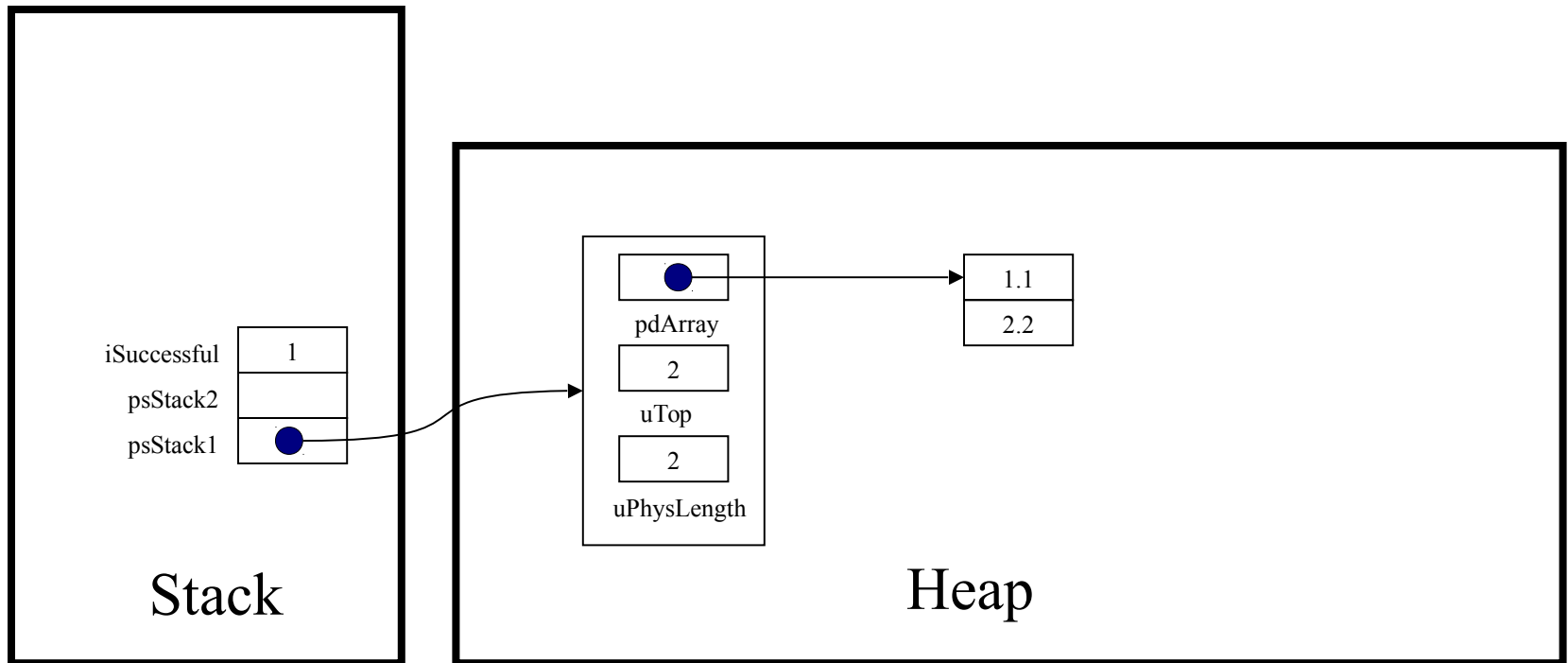
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Trace of teststack (Version 1)

```
if (! iSuccessful) handleMemoryError();
```



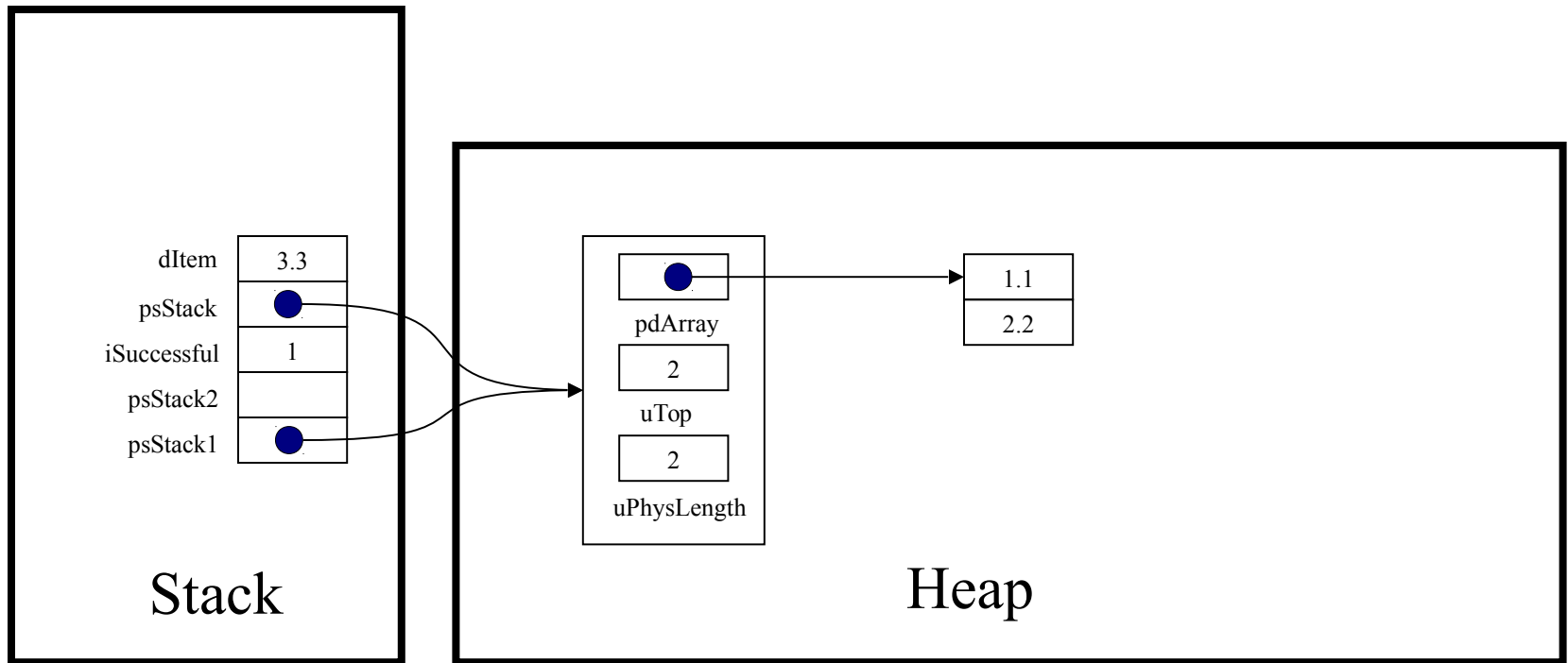
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Trace of teststack (Version 1)

```
iSuccessful = Stack_push(psStack1, 3.3);
```



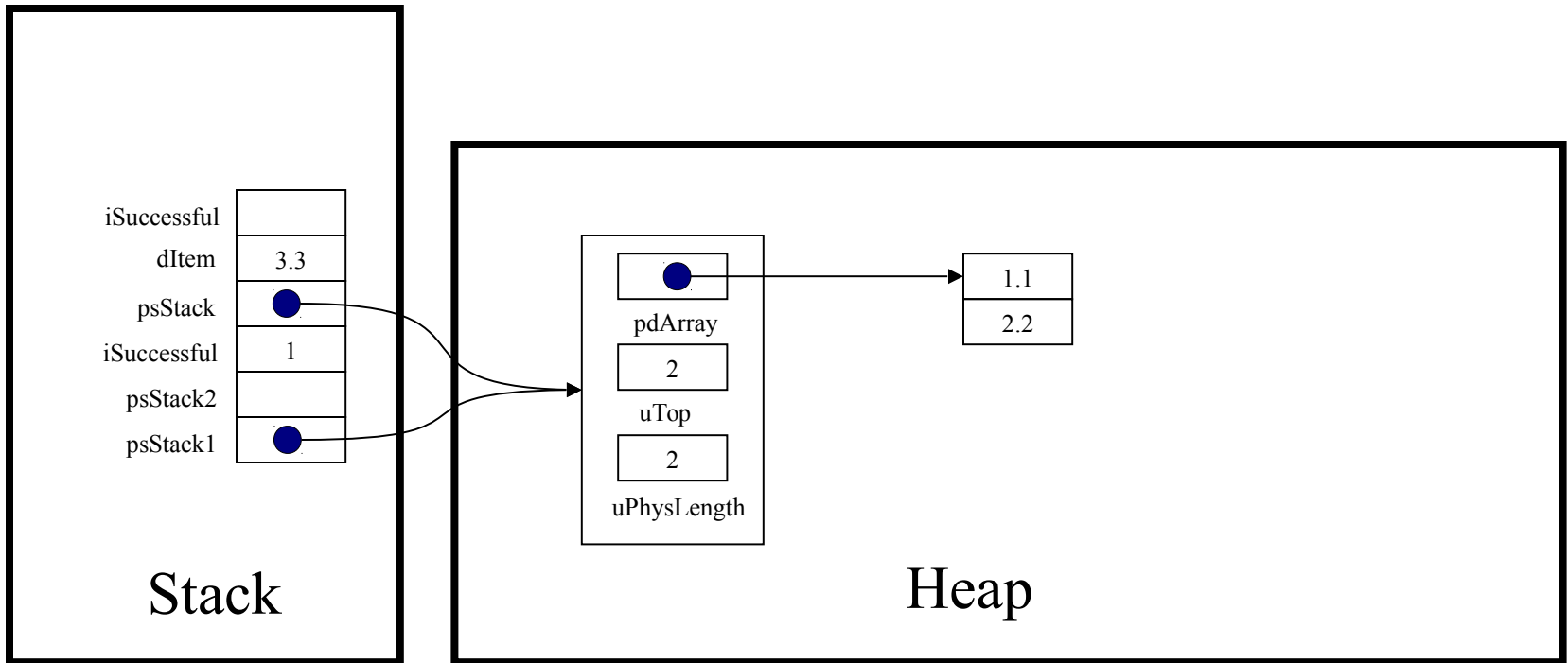
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```
int Stack_push(struct Stack *psStack, double dItem)
```



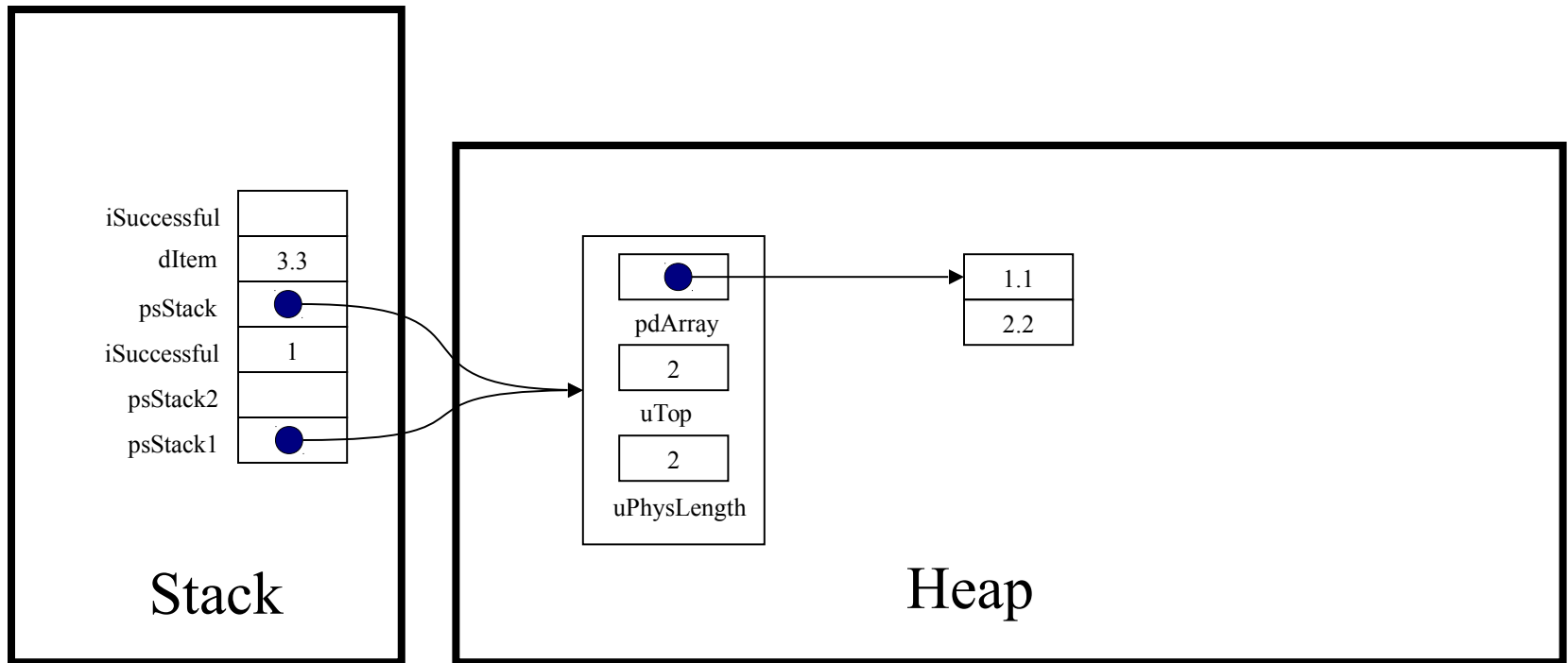
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Trace of teststack (Version 1)

```
int iSuccessful;
```



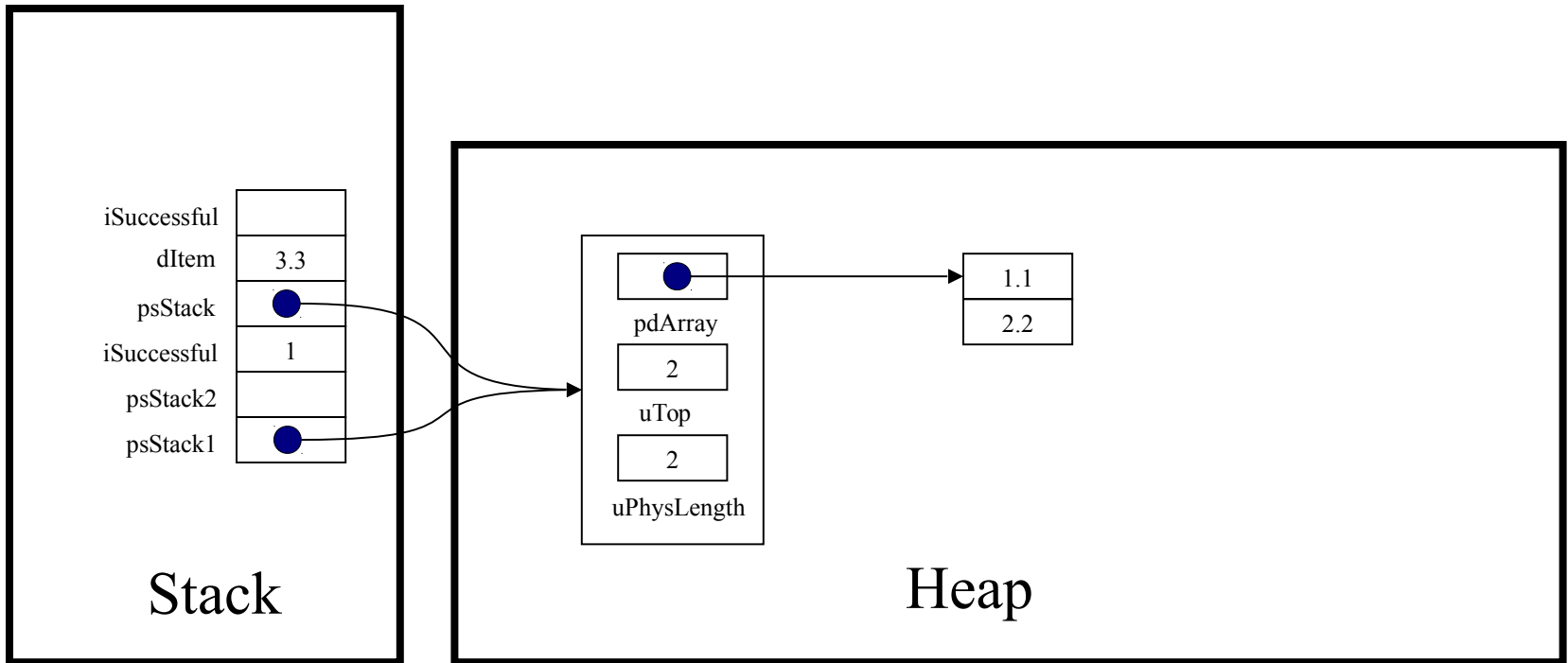
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



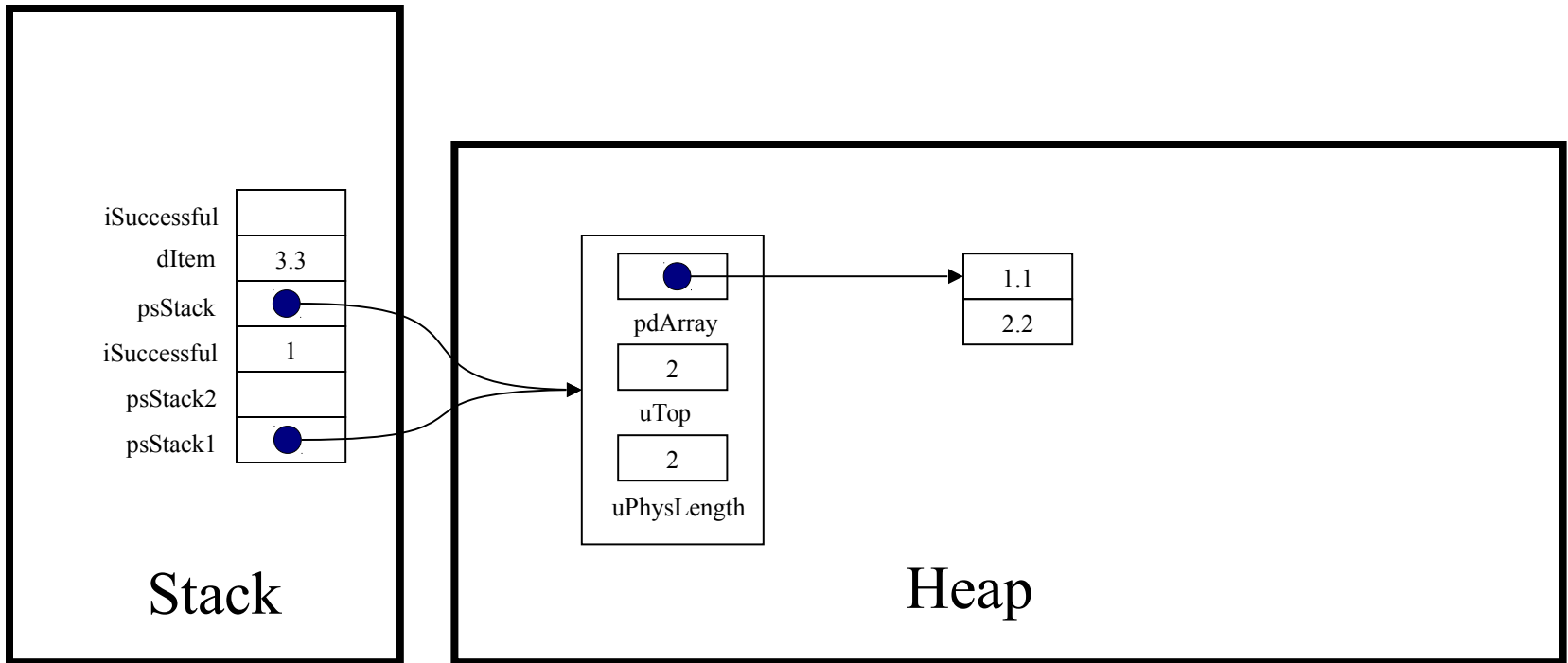
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```
if (psStack->uTop == psStack->uPhysLength)
```



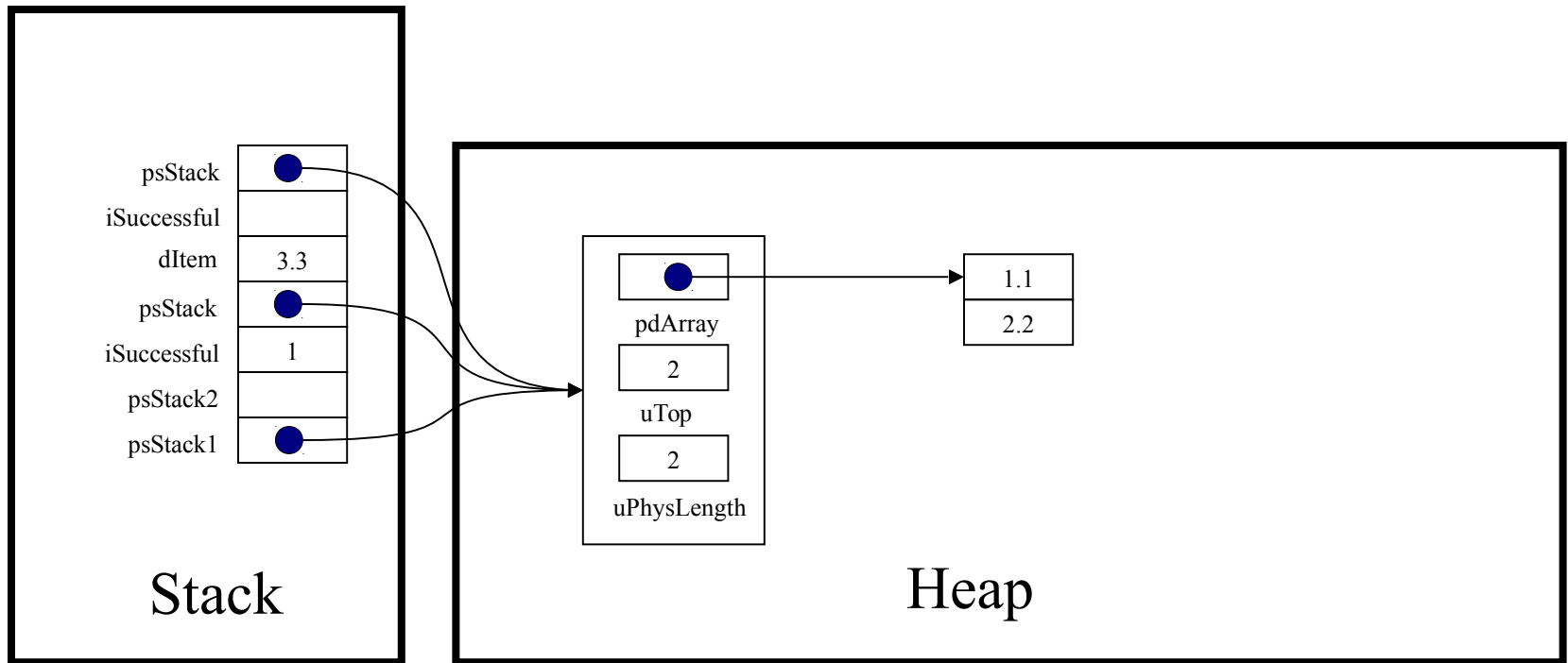
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```
iSuccessful = Stack_grow(psStack);
```



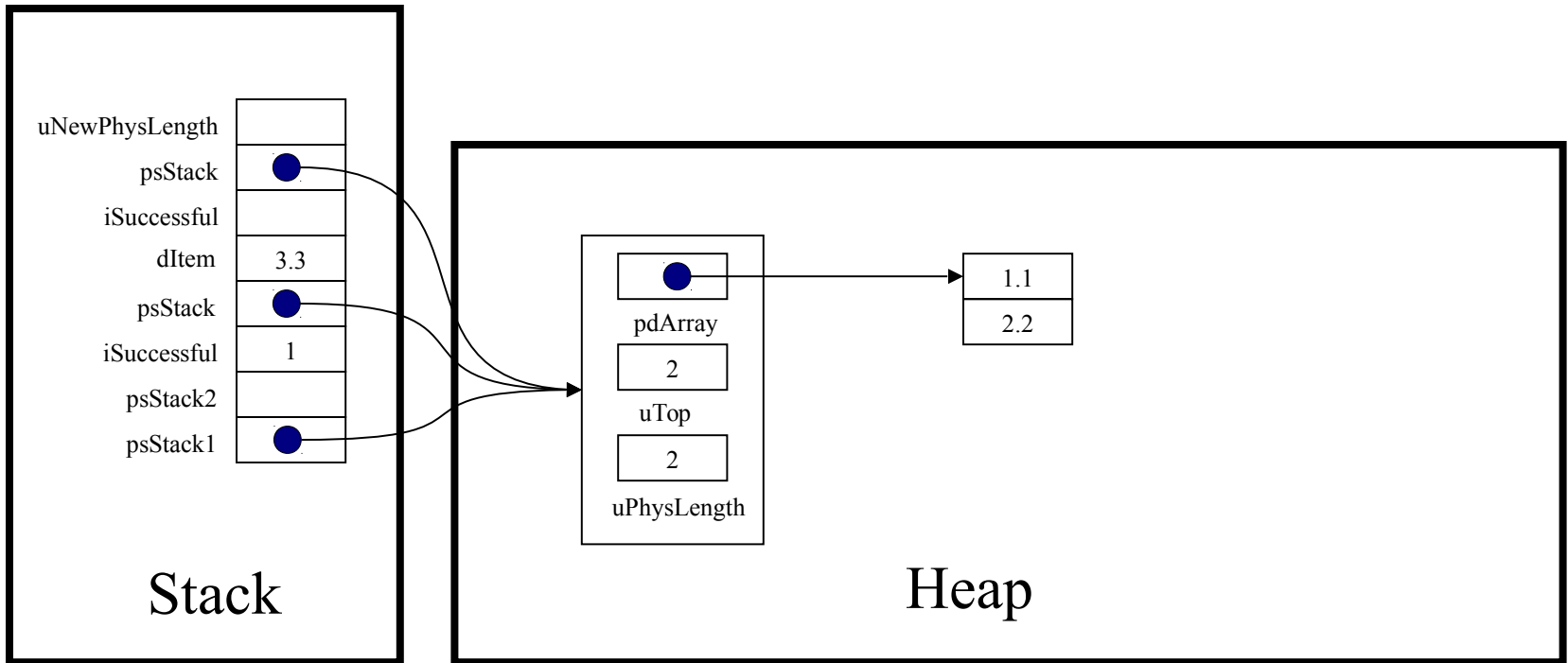
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Trace of teststack (Version 1)

```
static int Stack_grow(struct Stack *psStack)
```



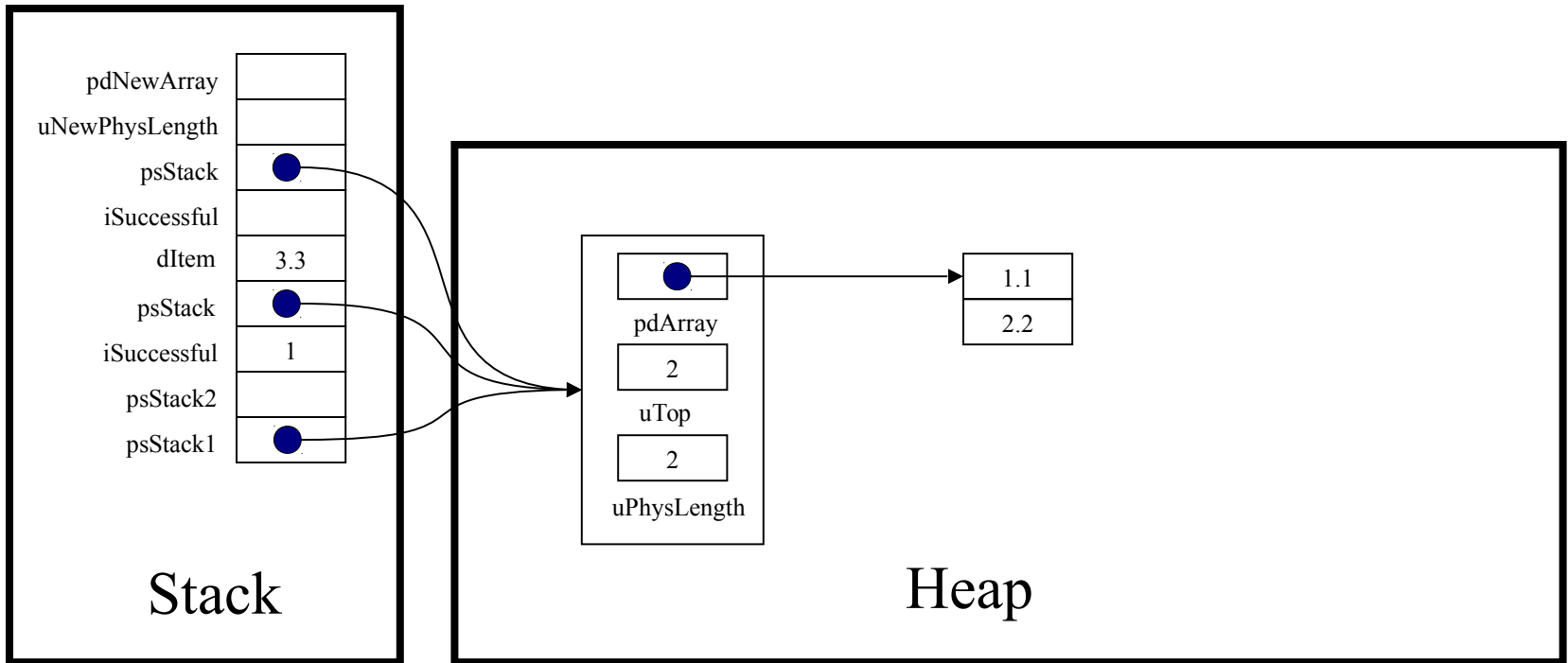
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```
size_t uNewPhysLength;
```



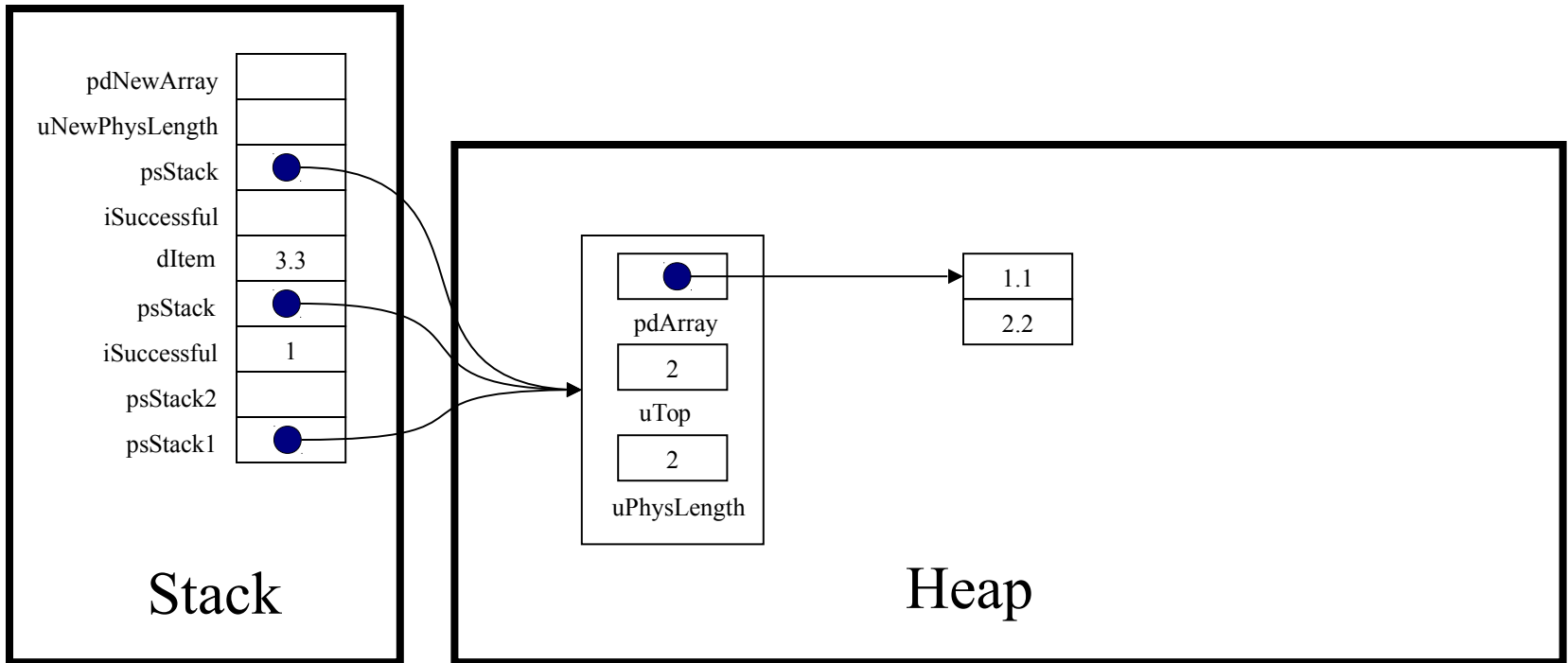
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```
double *pdNewArray;
```



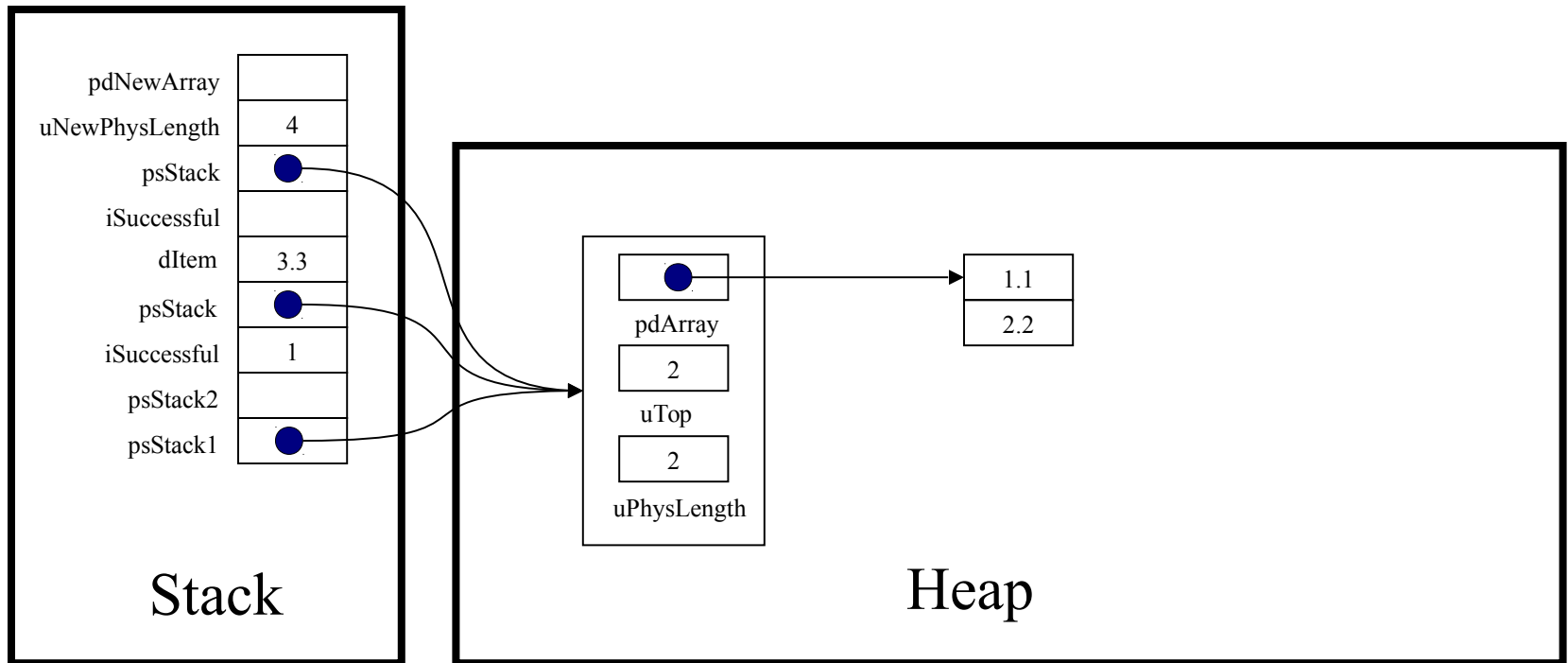
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```
assert (psStack != NULL);
```



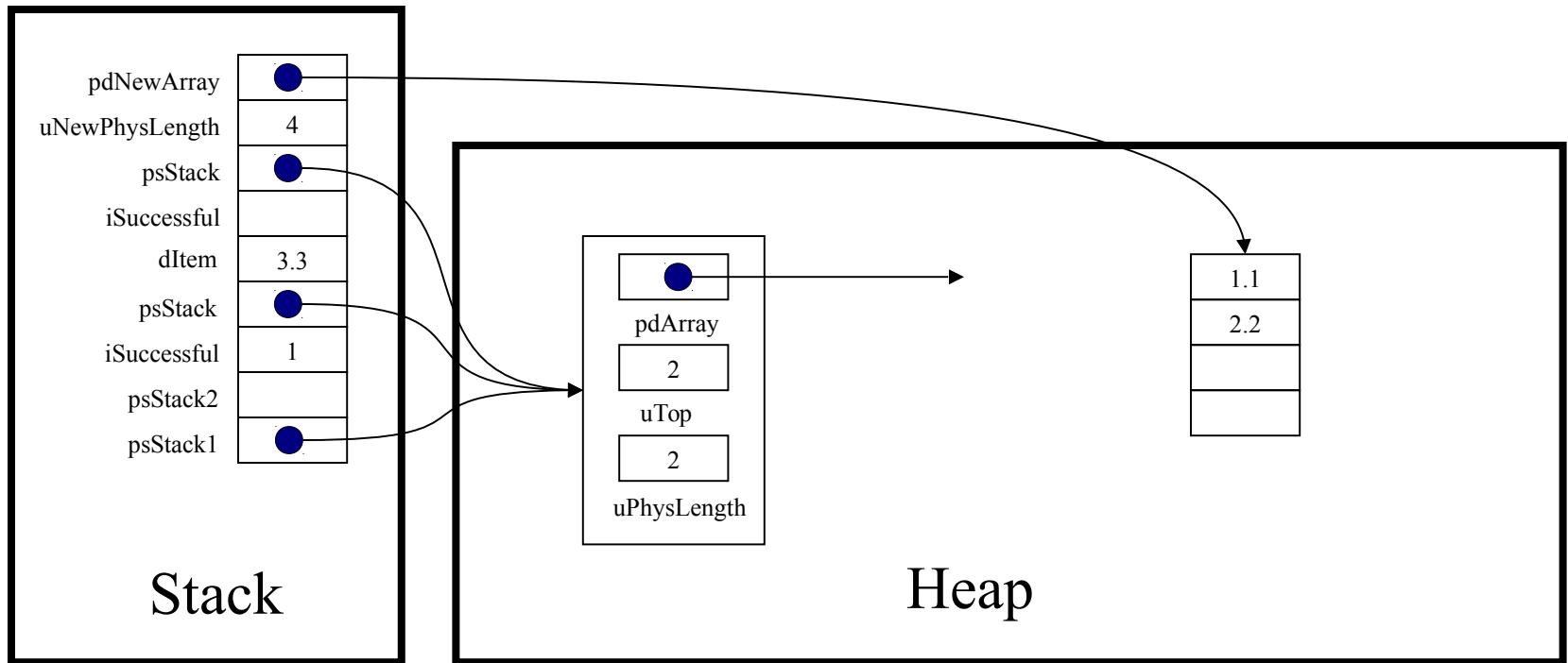
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```
uNewPhysLength = GROWTH_FACTOR * pcStack->uPhysLength;
```



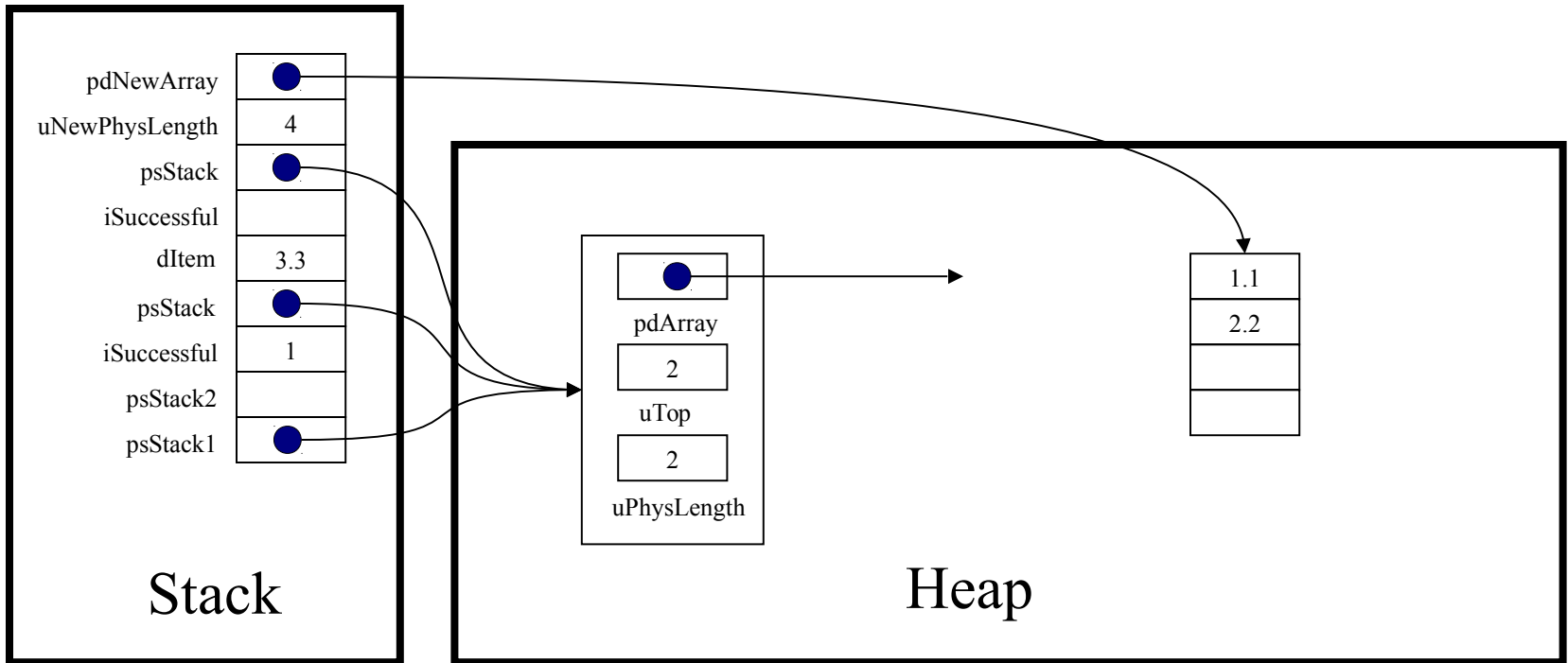
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```
pdNewArray = (double*)  
  realloc(psStack->pdArray, sizeof(double) * uNewPhysLength);
```



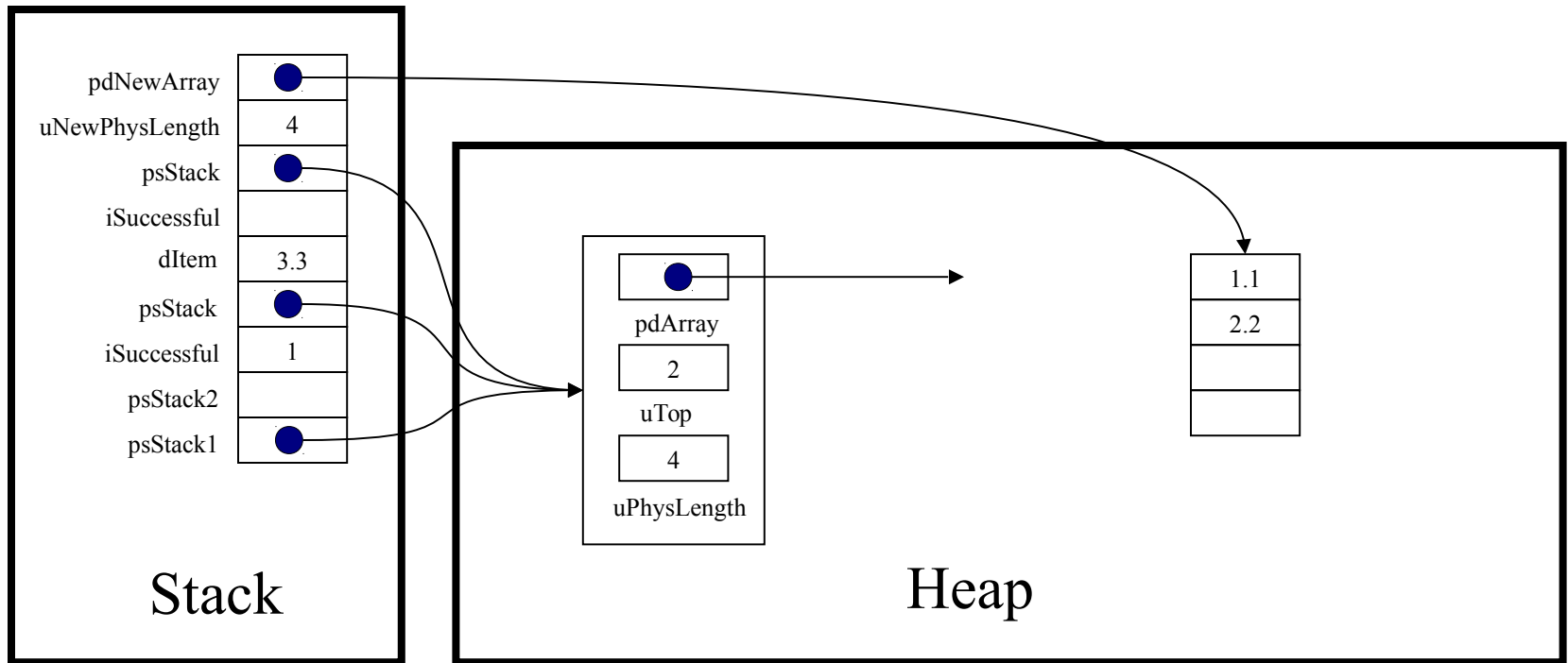
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```
if (pdNewArray == NULL)  
    return 0;
```



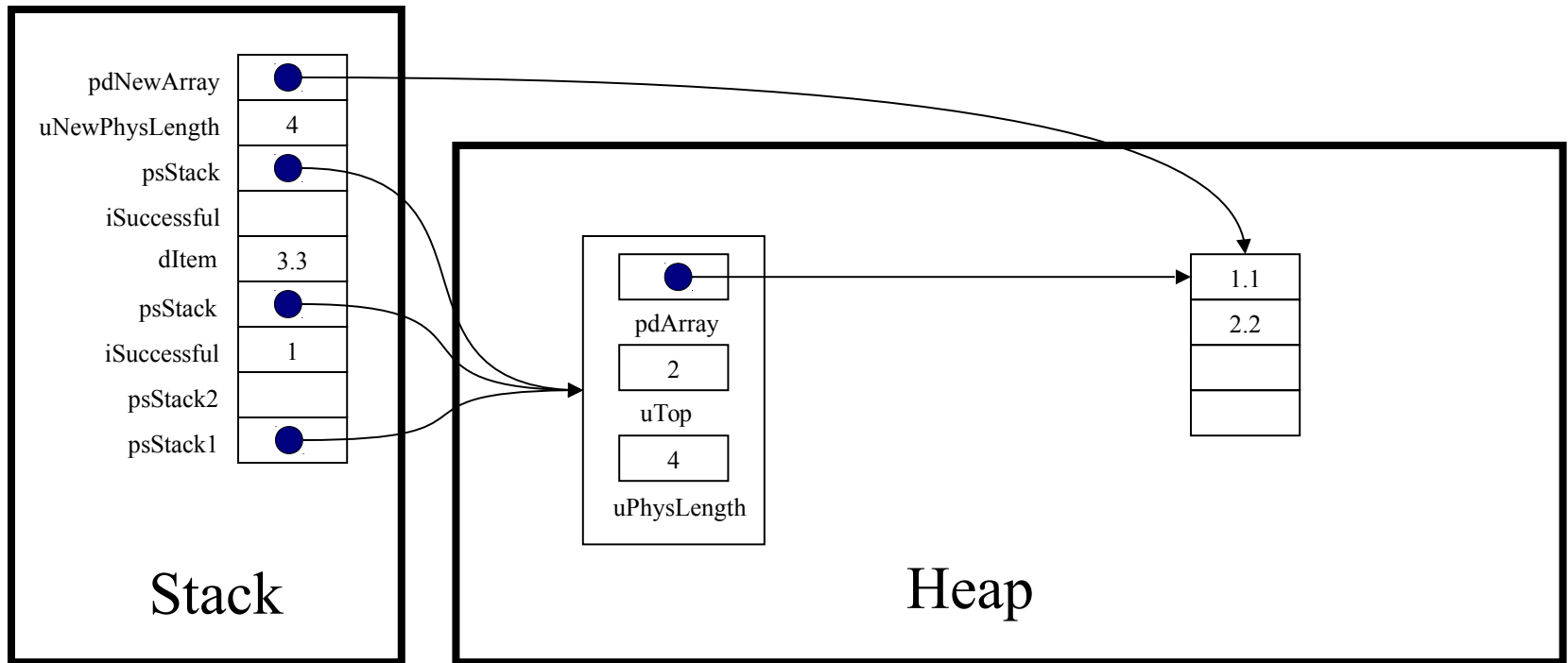
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```
psStack->uPhysLength = uNewPhysLength;
```



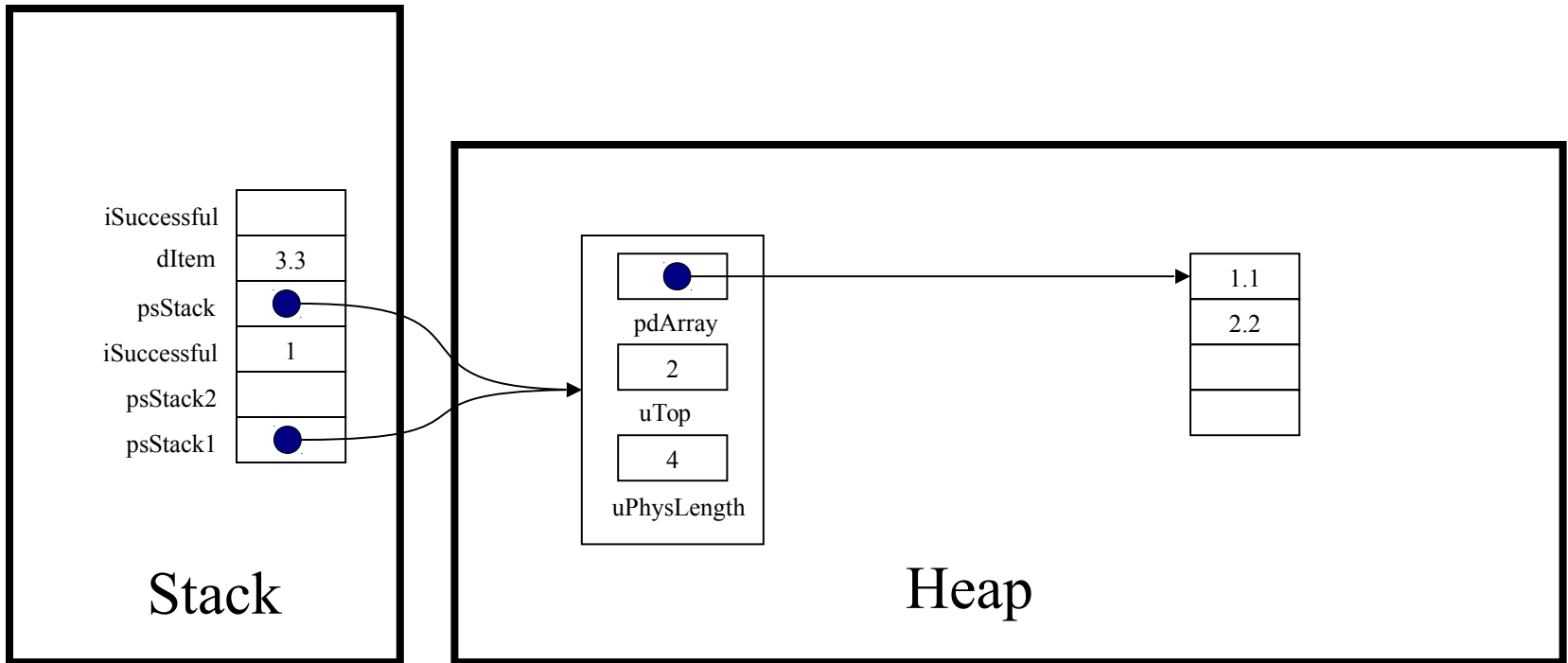
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Trace of teststack (Version 1)

```
psStack->pdArray = pdNewArray;
```



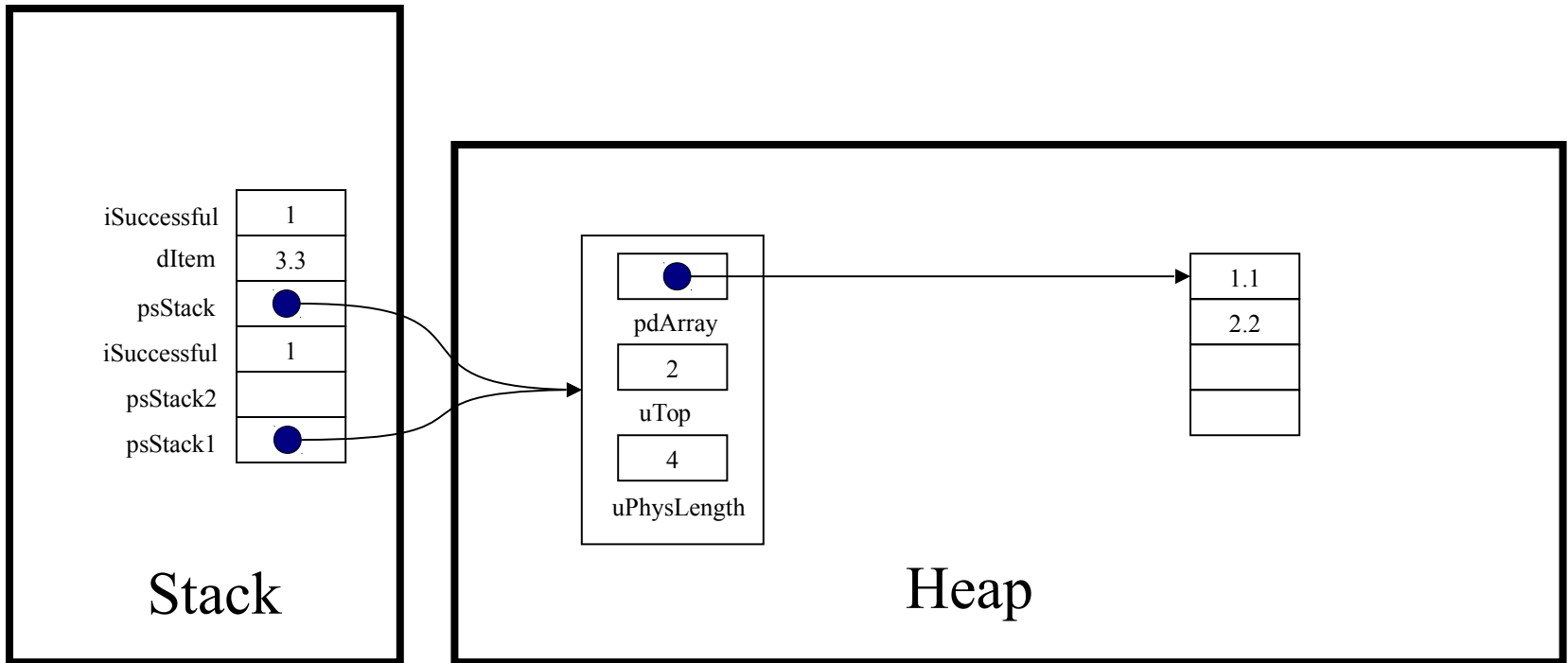
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```
return 1;
```



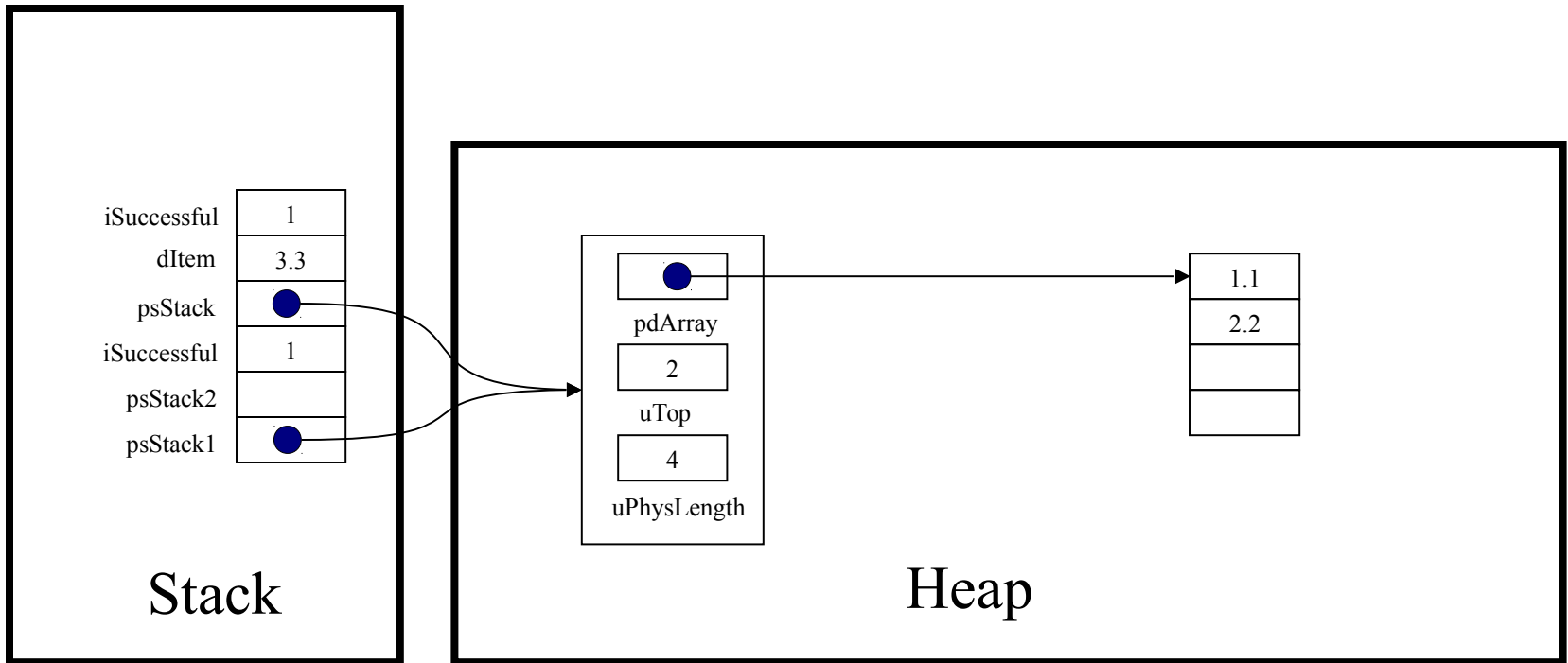
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Trace of teststack (Version 1)

```
iSuccessful = Stack_grow(psStack);
```



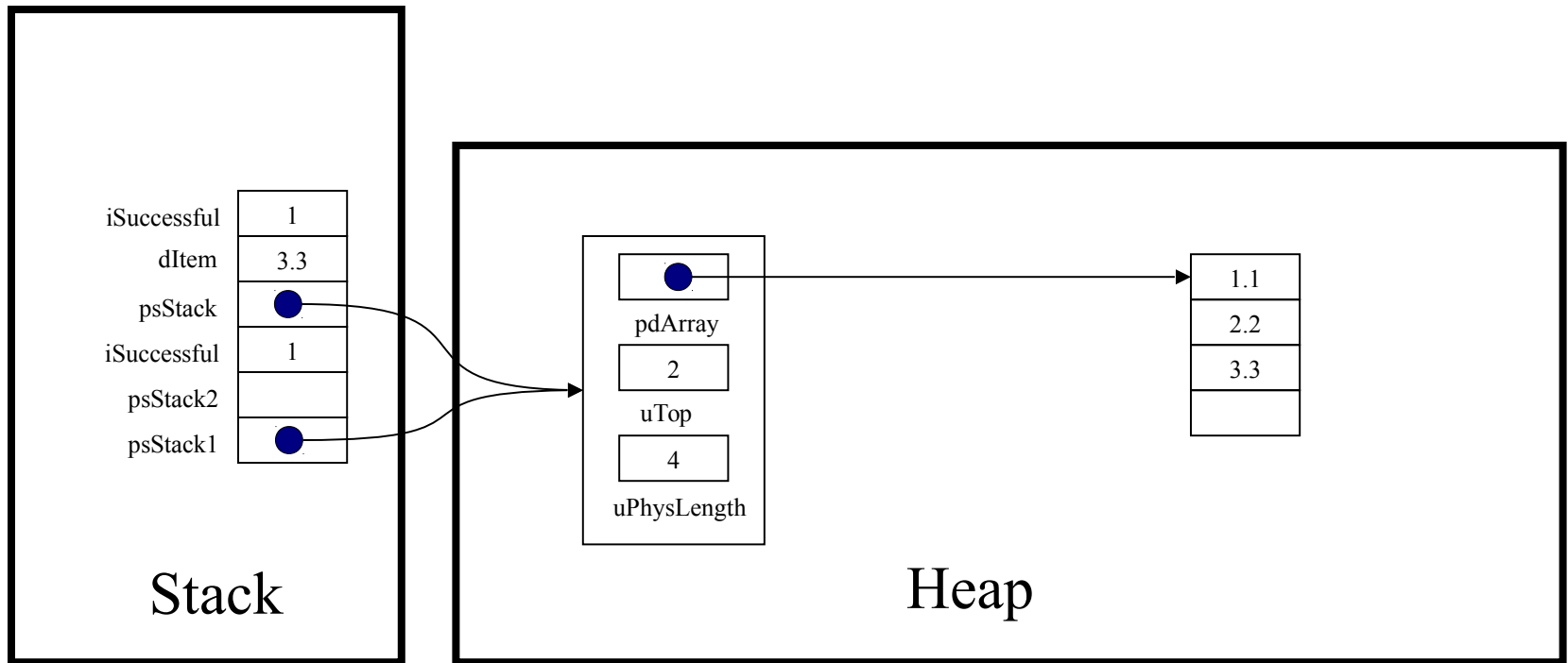
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Trace of teststack (Version 1)

```
if (! iSuccessful)  
    return 0;
```



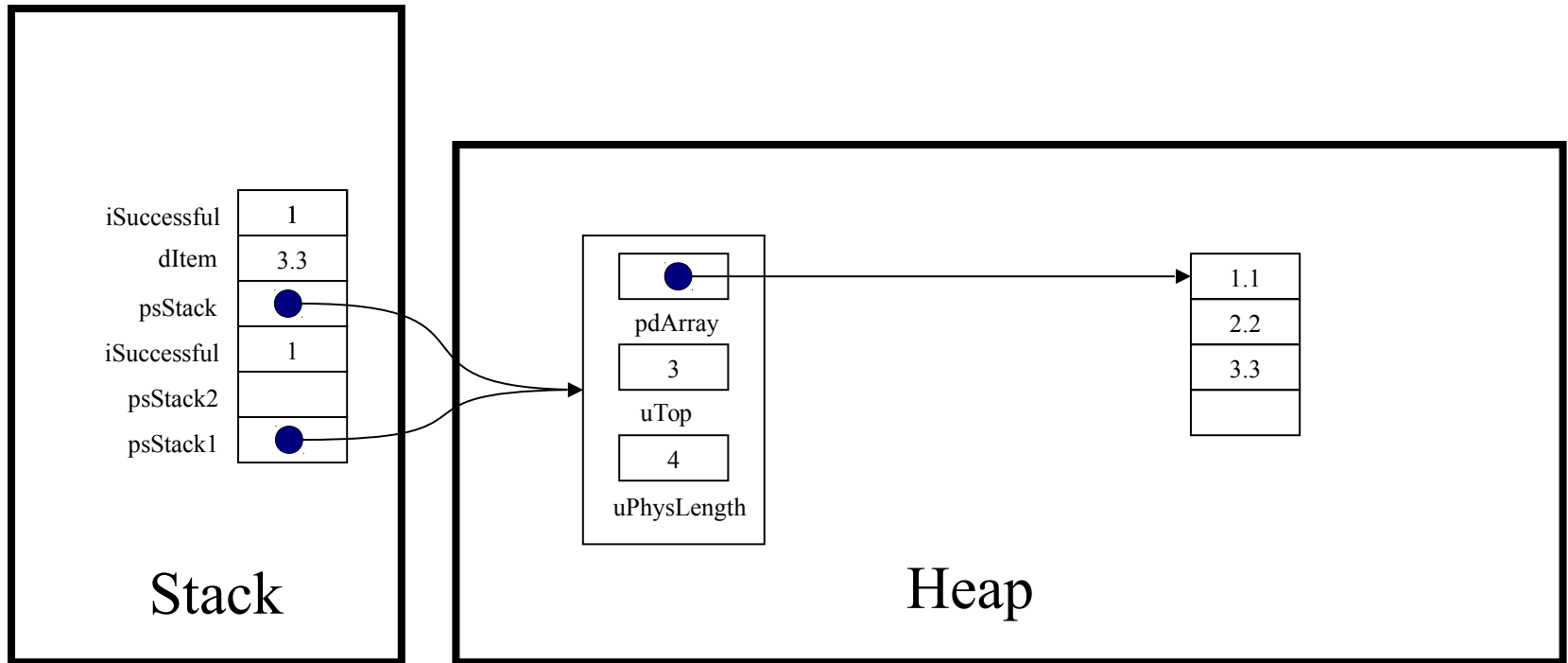
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Trace of teststack (Version 1)

```
(psStack->pdArray)[psStack->uTop] = dItem;
```



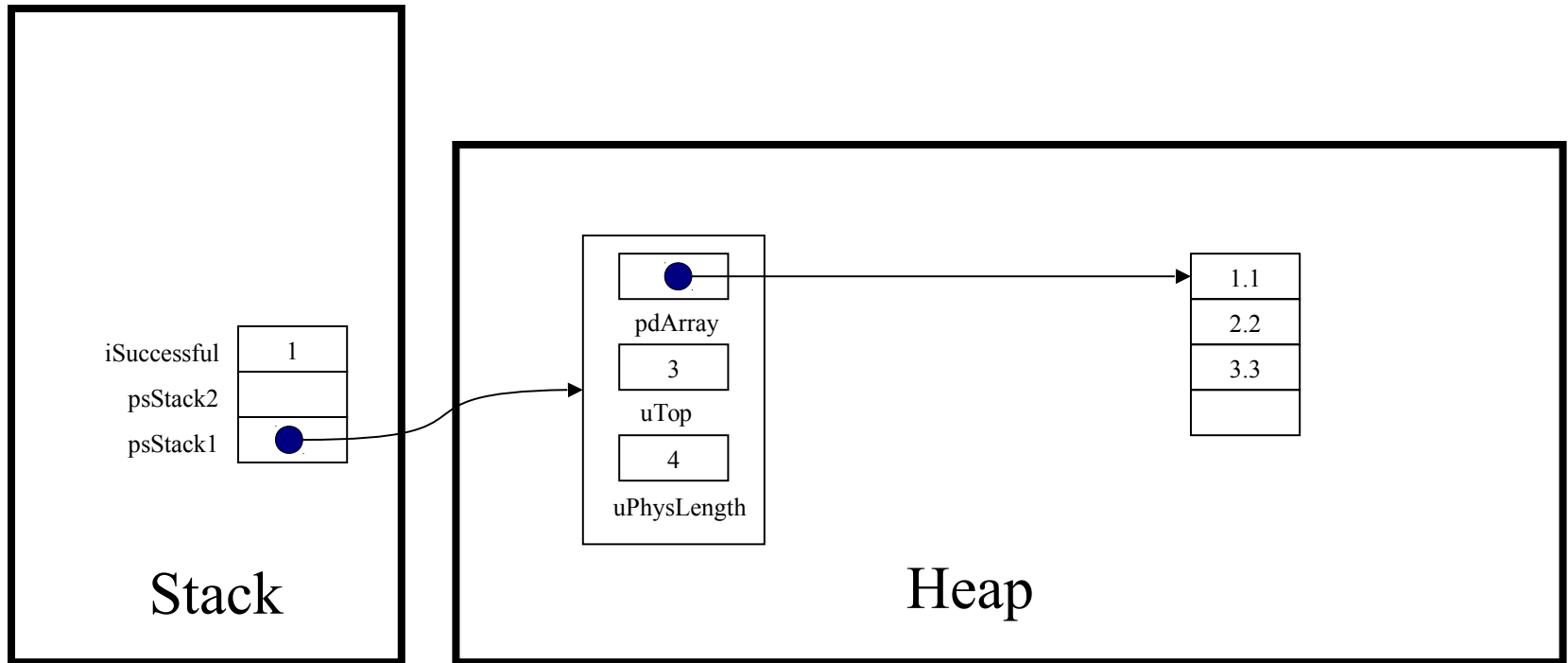
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Trace of teststack (Version 1)

```
(psStack->uTop) ++;
```



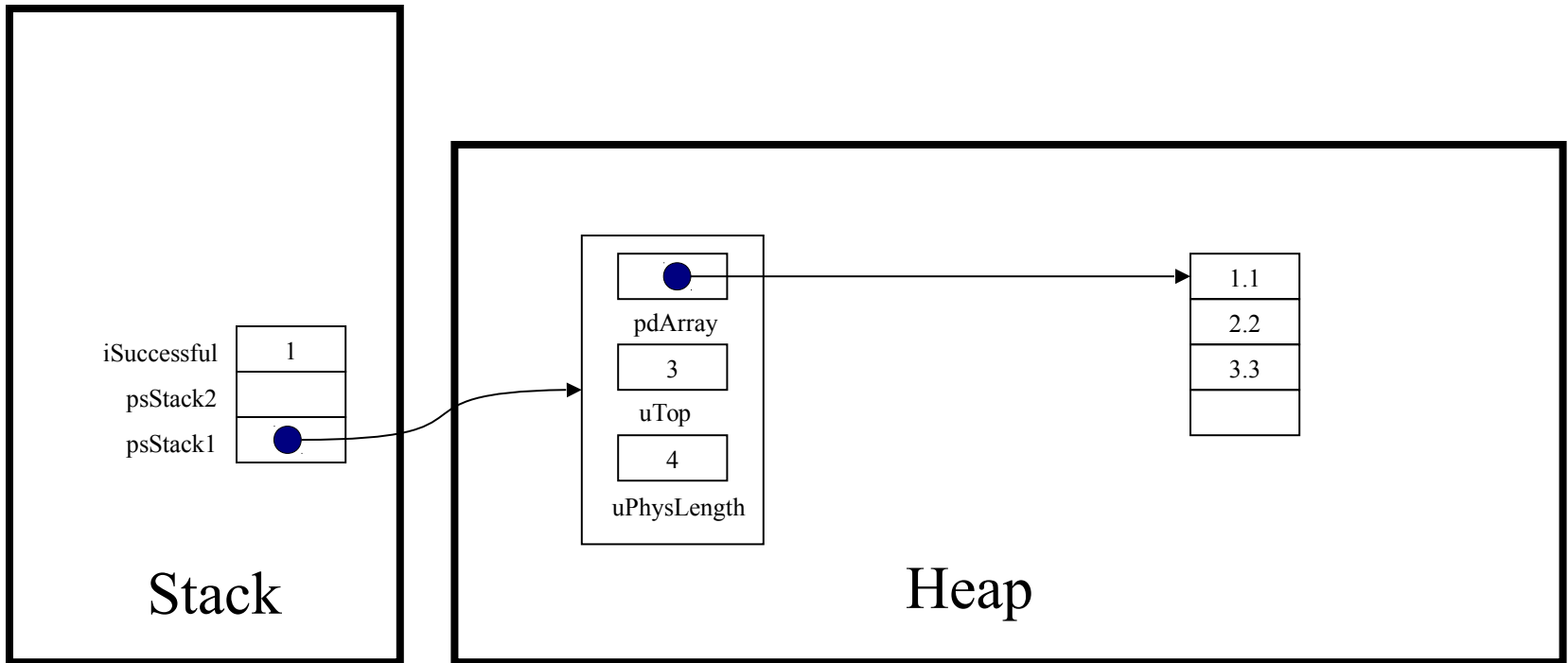
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Trace of teststack (Version 1)

```
return 1;
```



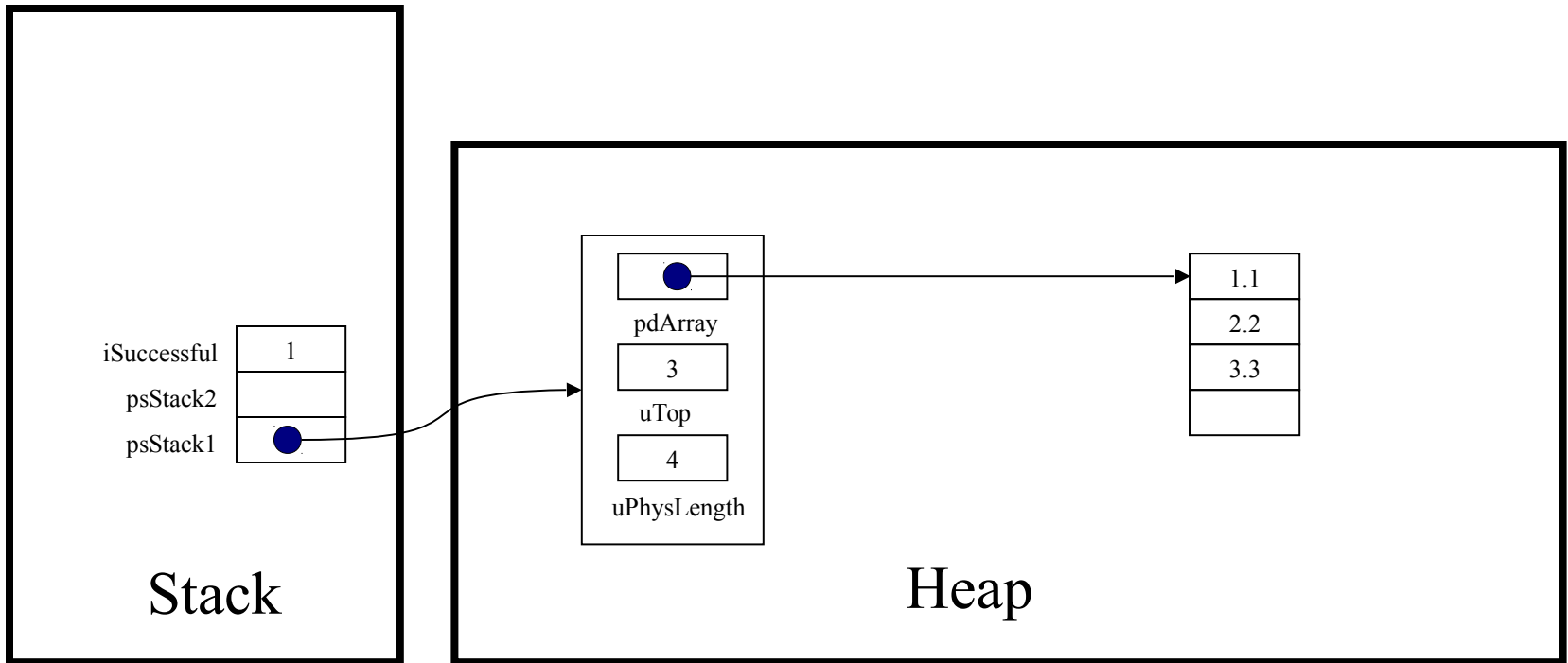
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Trace of teststack (Version 1)

```
iSuccessful = Stack_push(psStack1, 3.3);
```



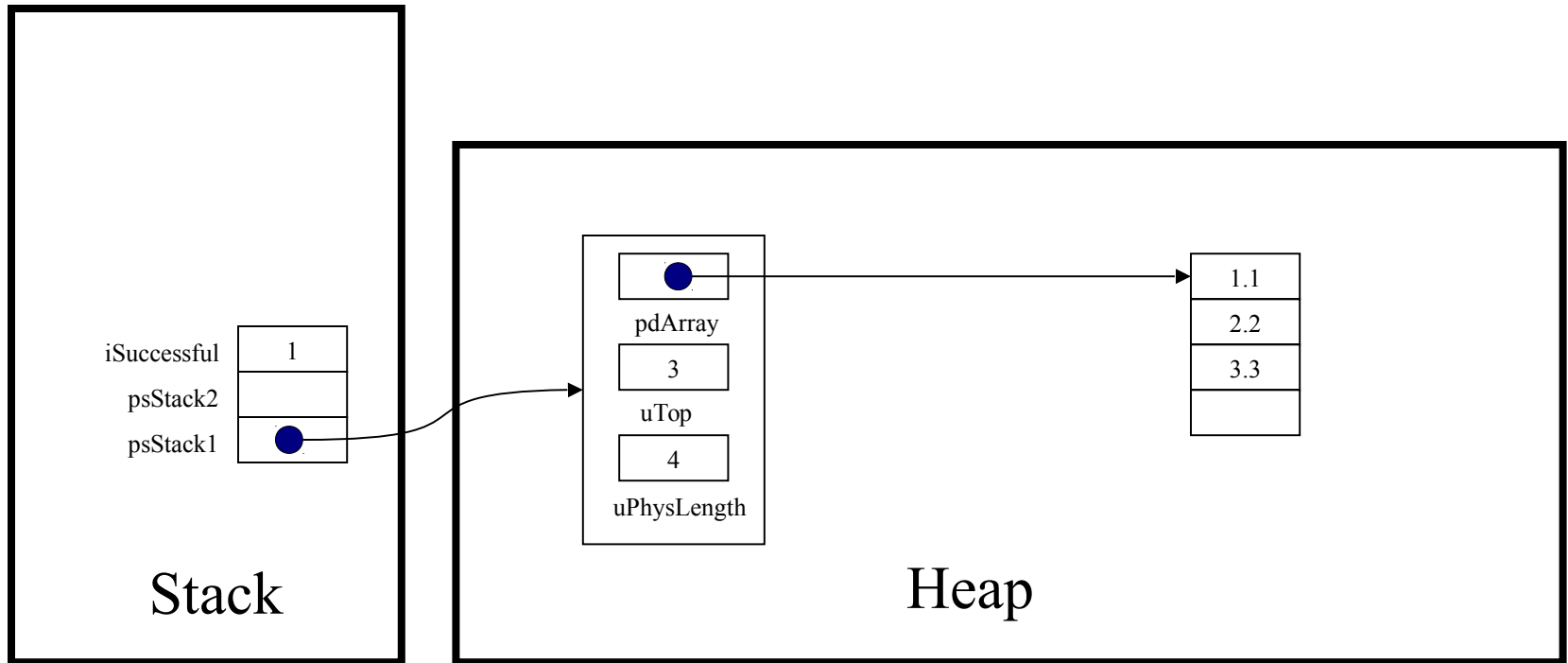
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Trace of teststack (Version 1)

```
if (! iSuccessful) handleMemoryError();
```



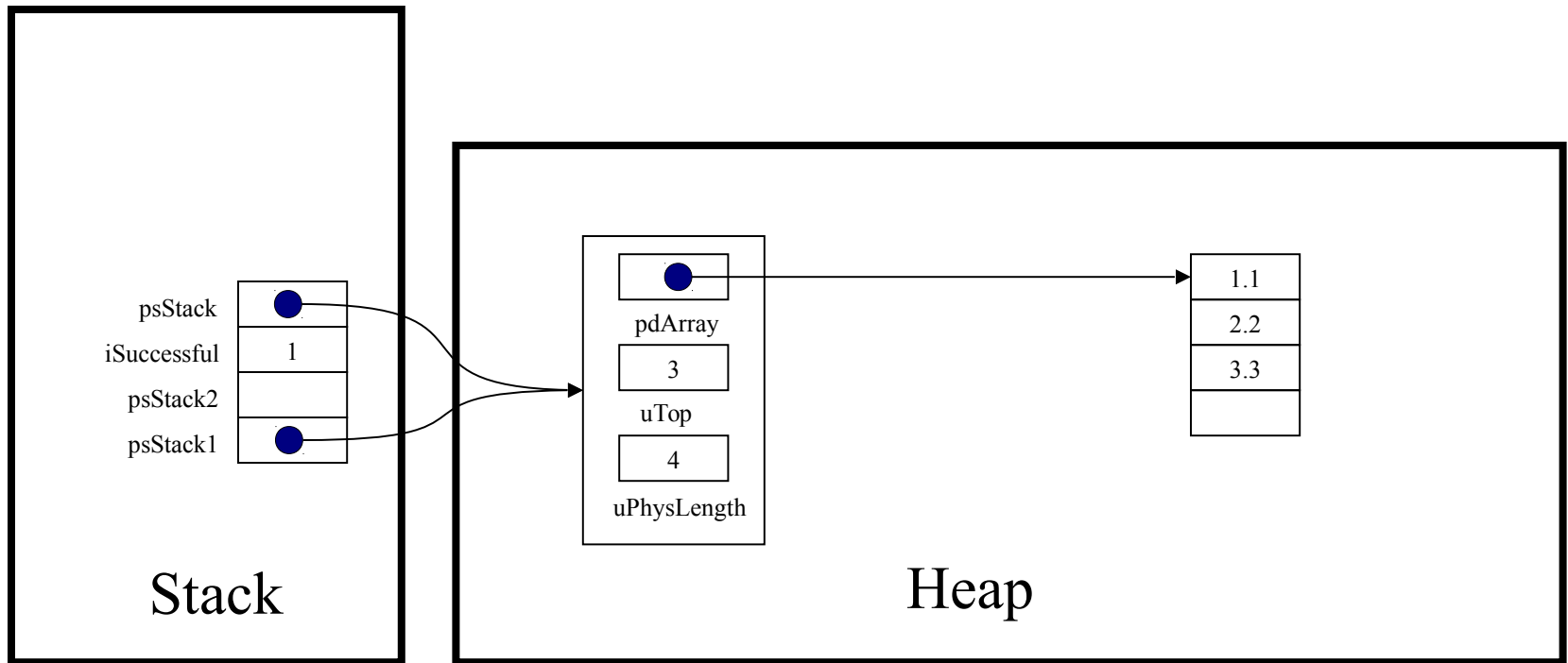
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```
while (! Stack_isEmpty(psStack1))  
    ...
```



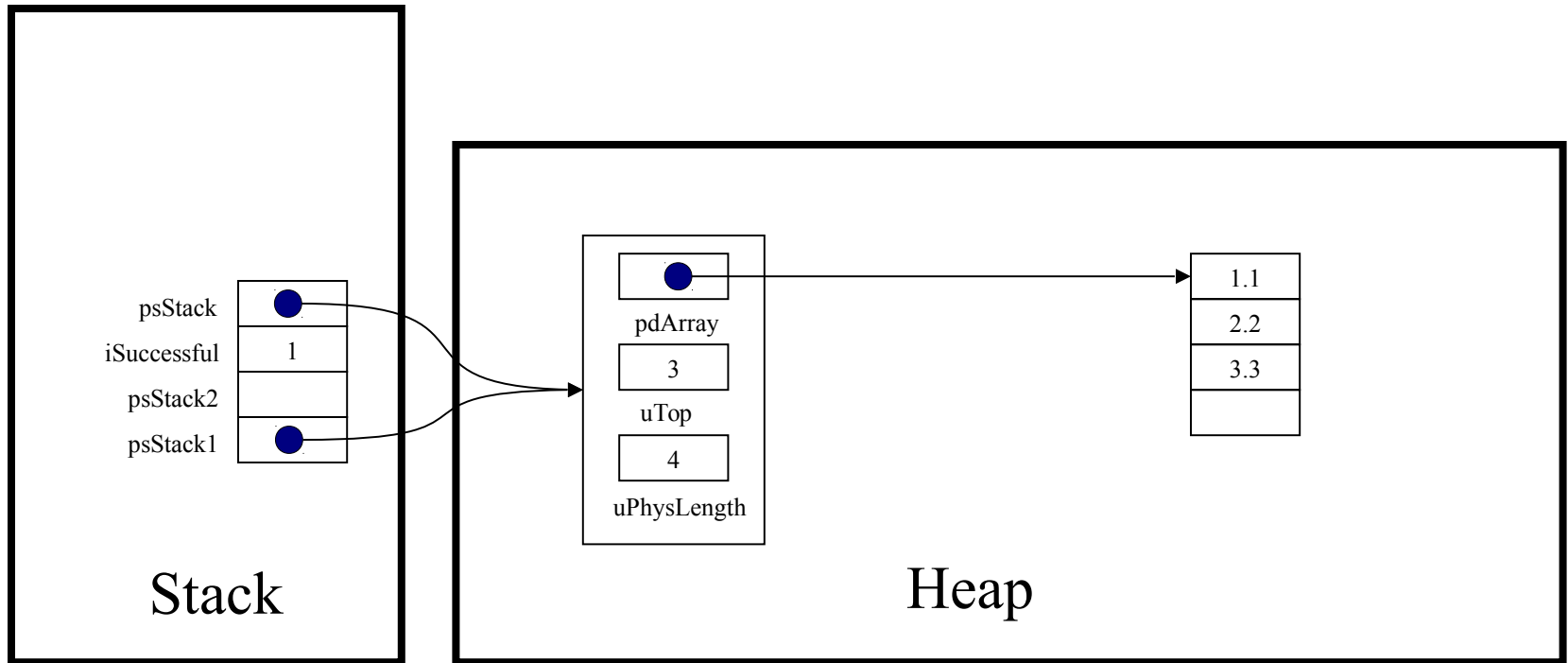
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Trace of teststack (Version 1)

```
int Stack_isEmpty(struct Stack *psStack)
```



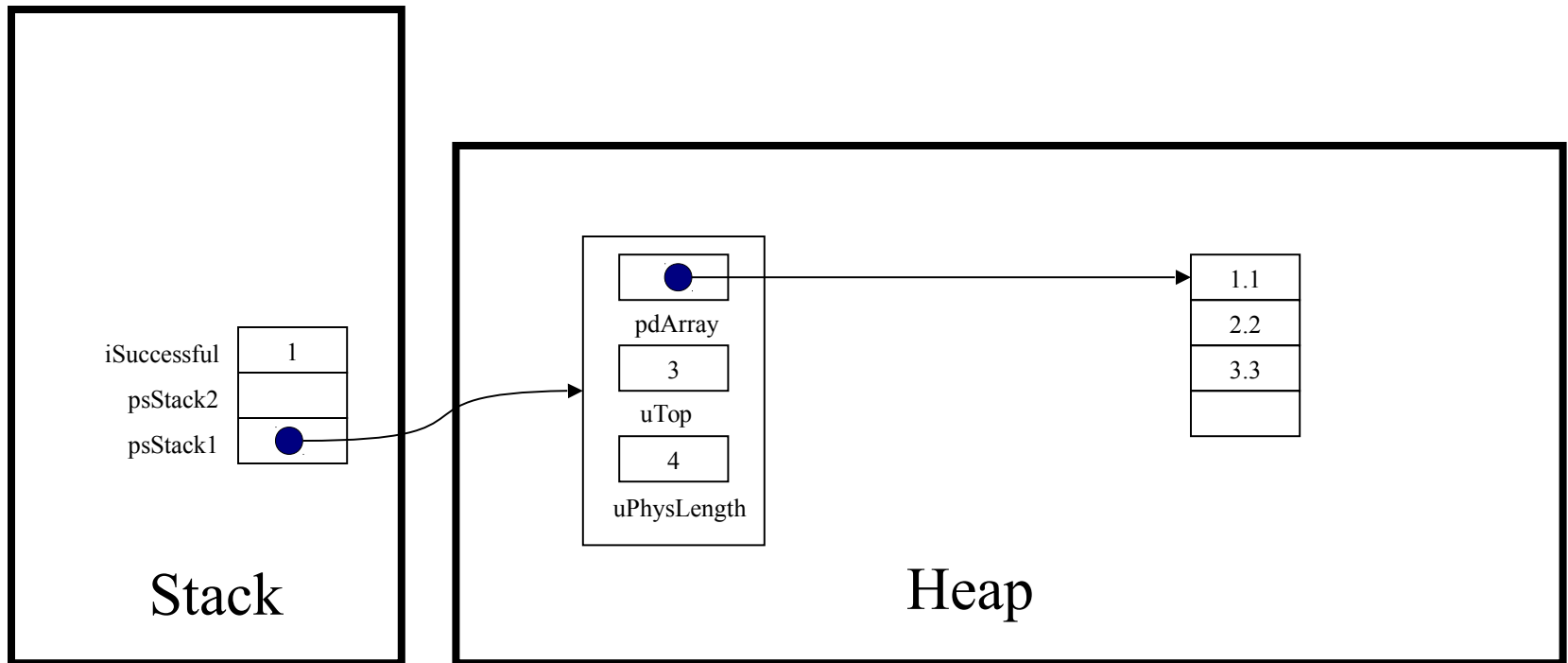
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```
assert (psStack != NULL);
```



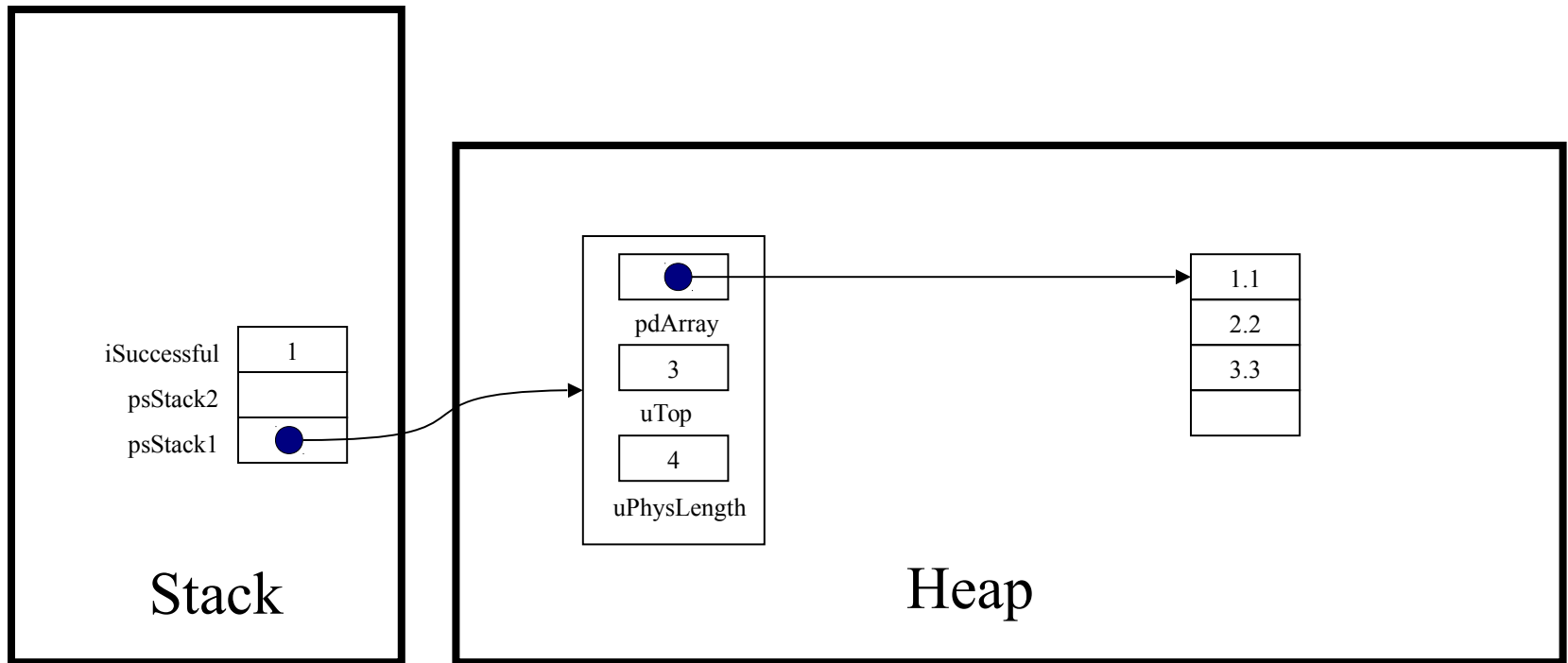
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```
return psStack->uTop == 0;
```



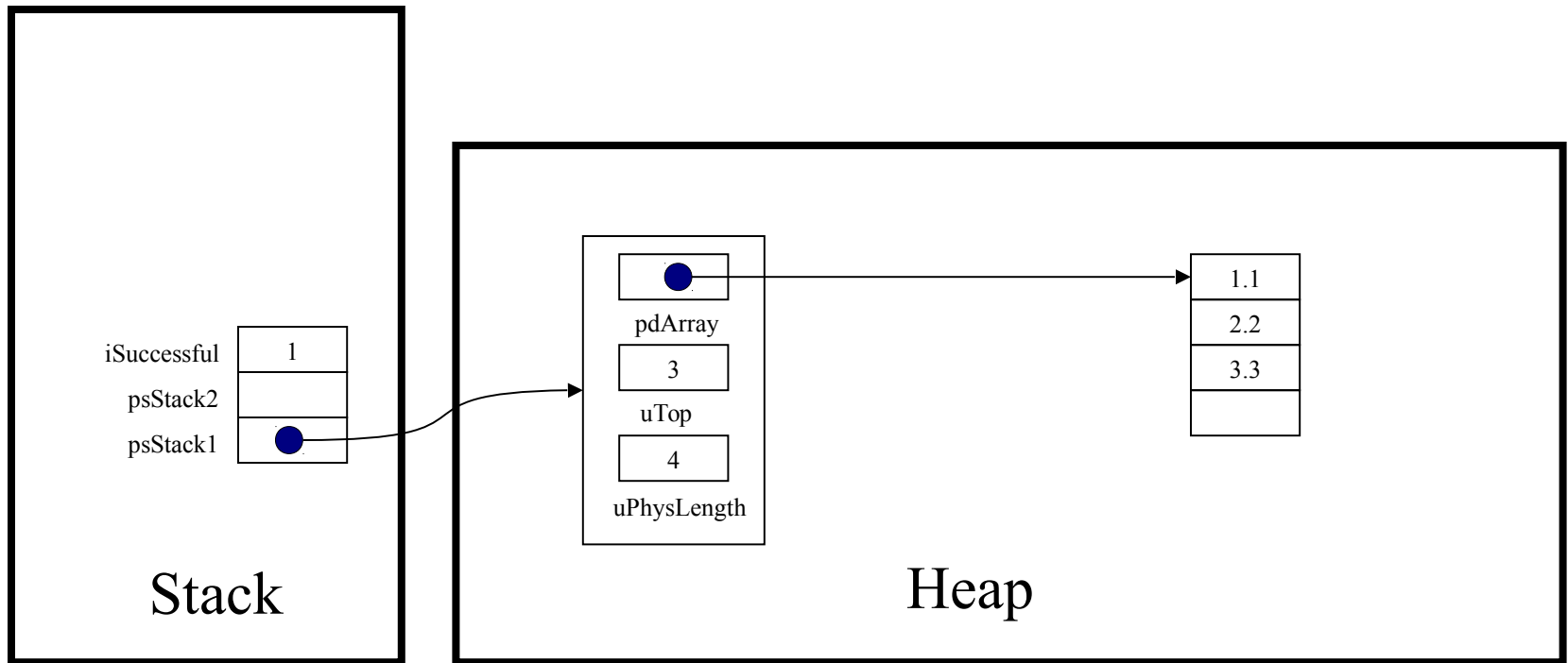
Princeton University
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack1))
```



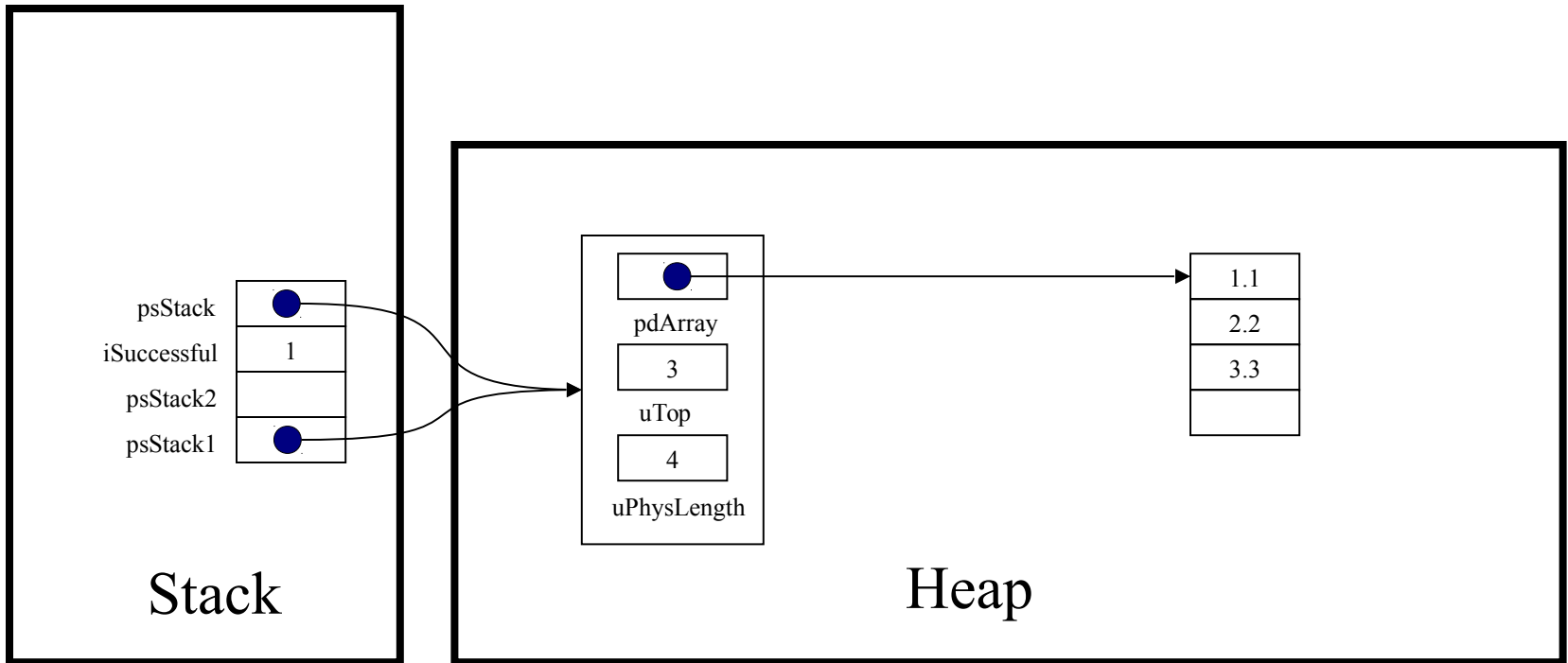
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Trace of teststack (Version 1)

```
printf("%g\n", Stack_pop(psStack1));
```



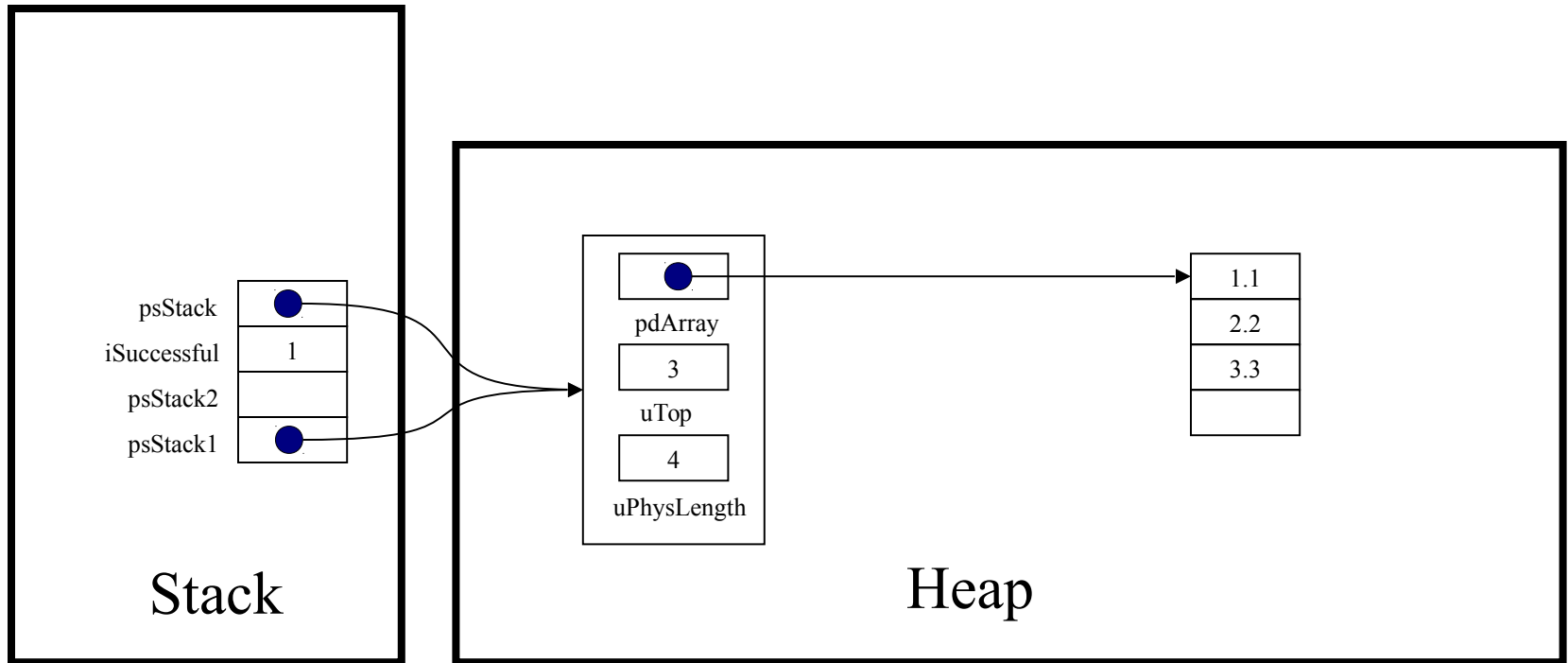
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Trace of teststack (Version 1)

```
double Stack_pop(struct Stack *psStack)
```



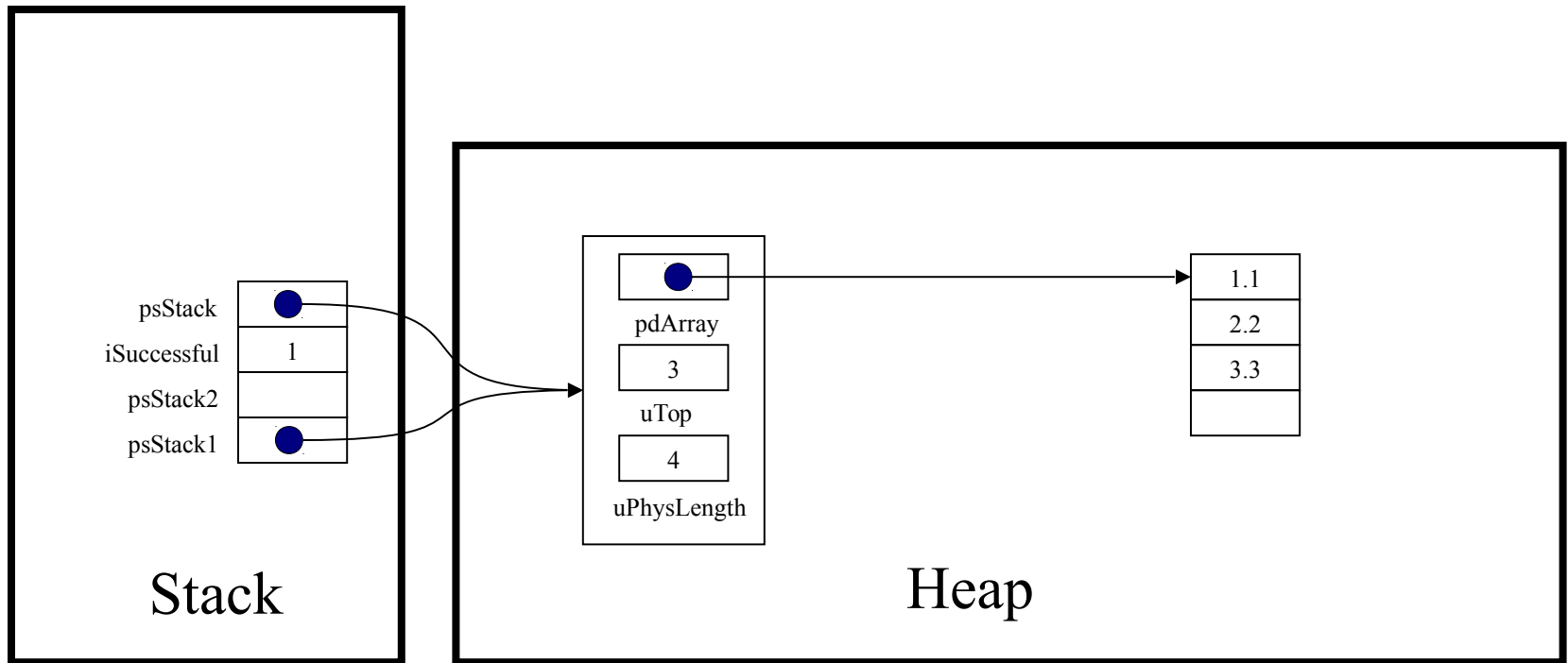
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



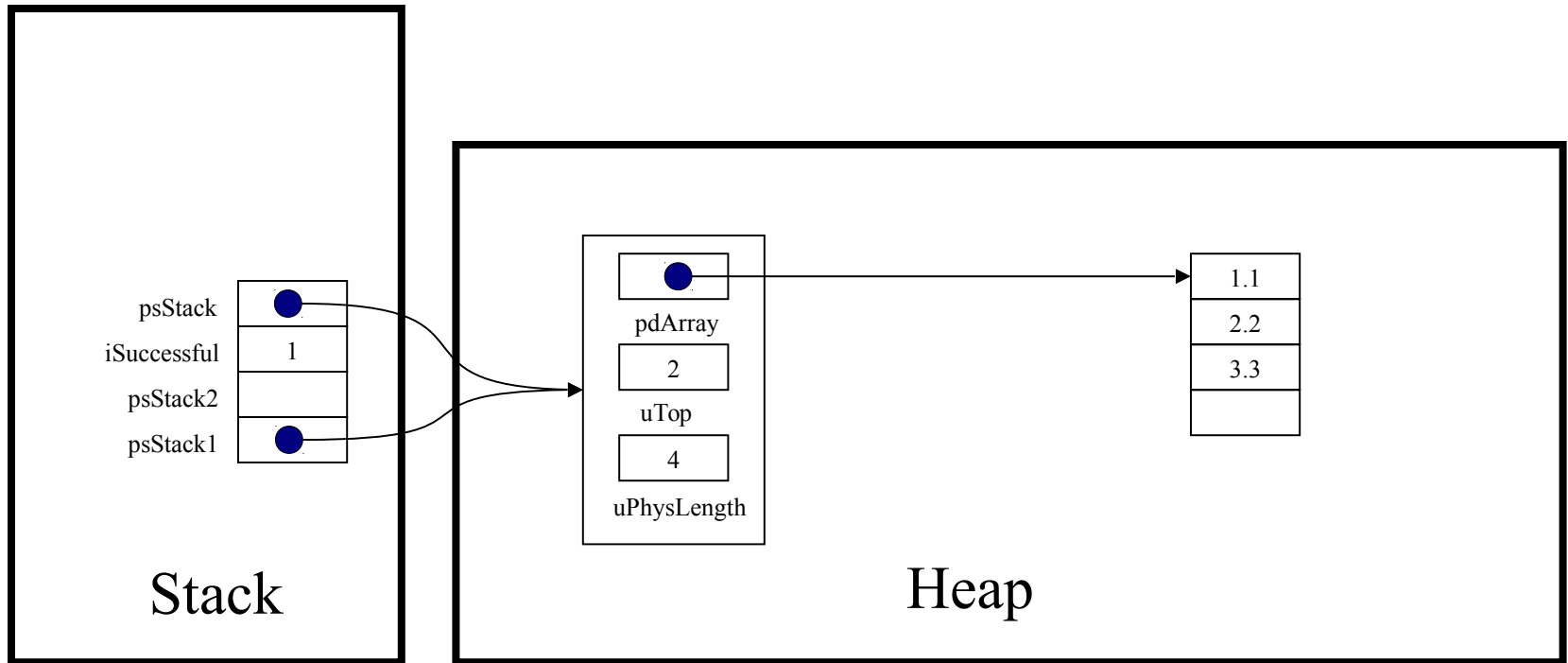
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Trace of teststack (Version 1)

```
assert (psStack->uTop > 0);
```



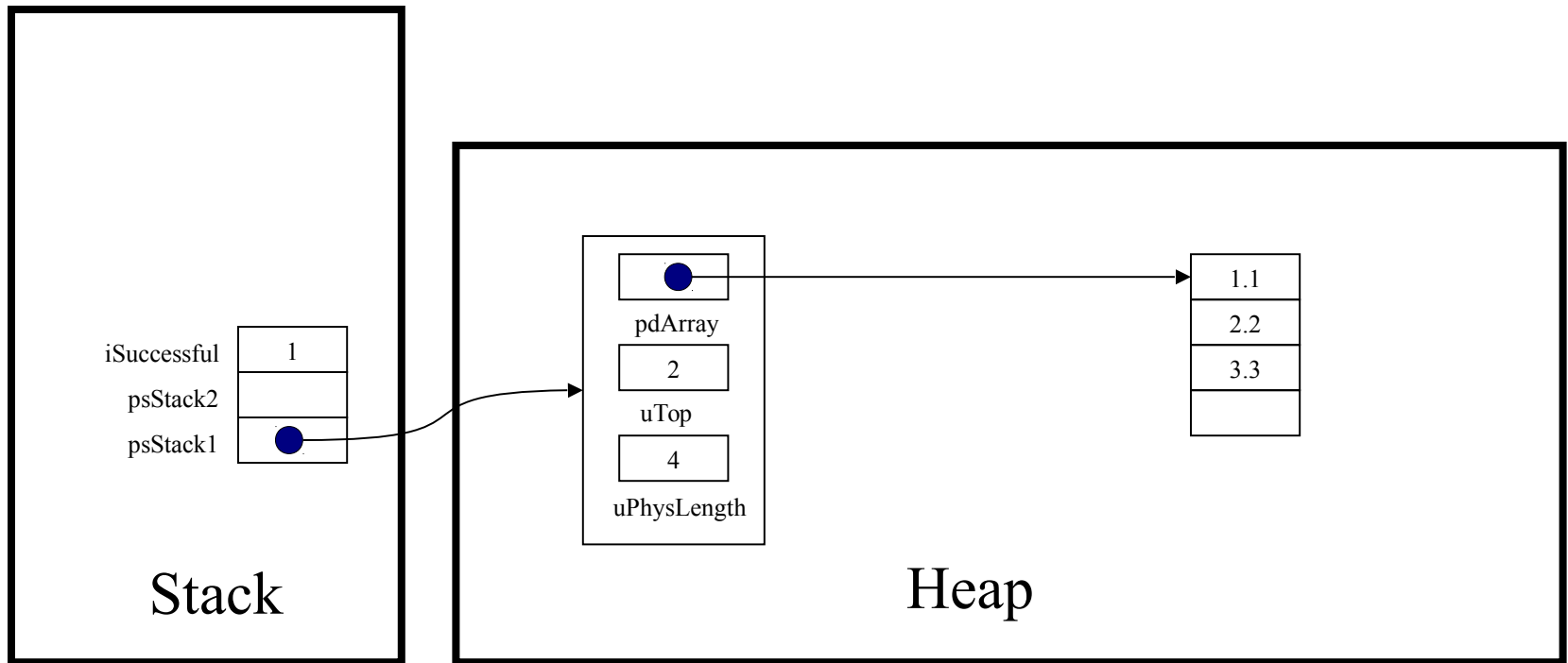
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Trace of teststack (Version 1)

```
(psStack->uTop) --;
```



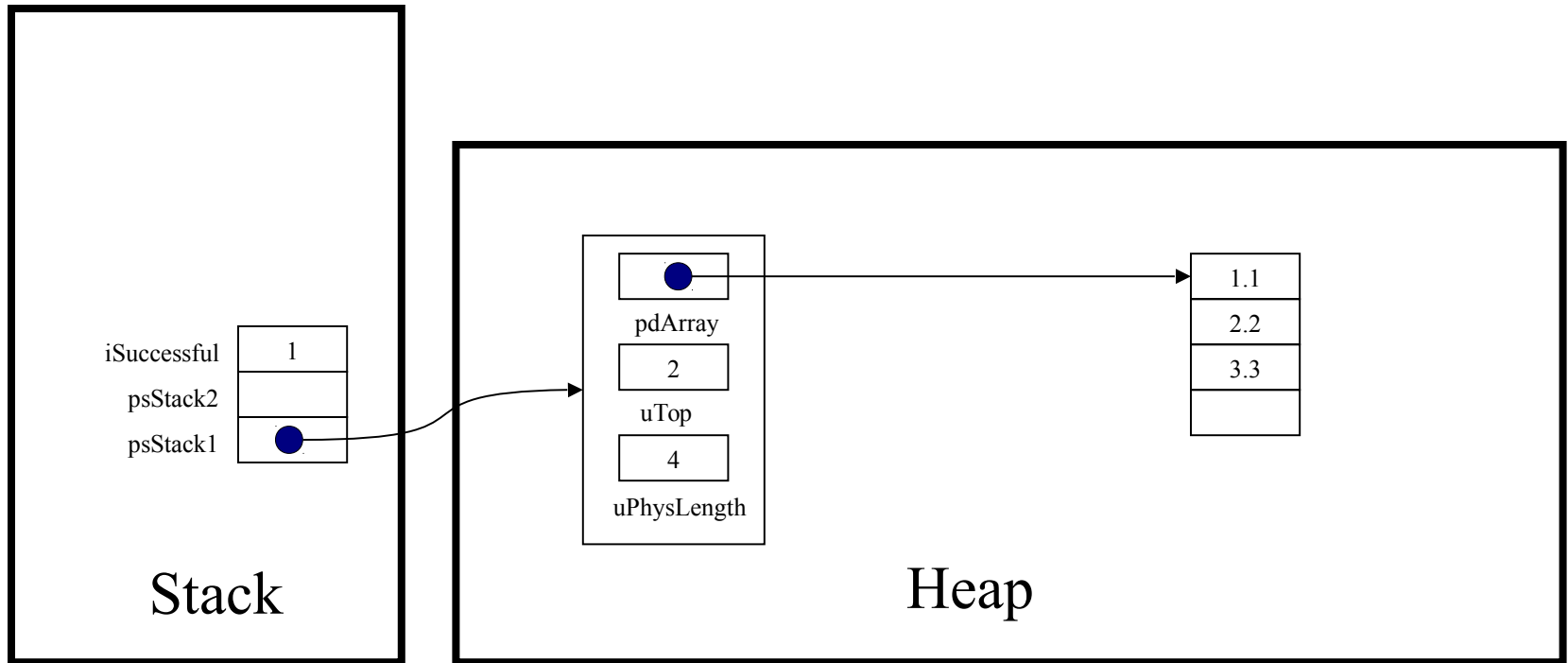
Princeton University
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Trace of teststack (Version 1)

```
return (psStack->pdArray)[psStack->uTop];
```



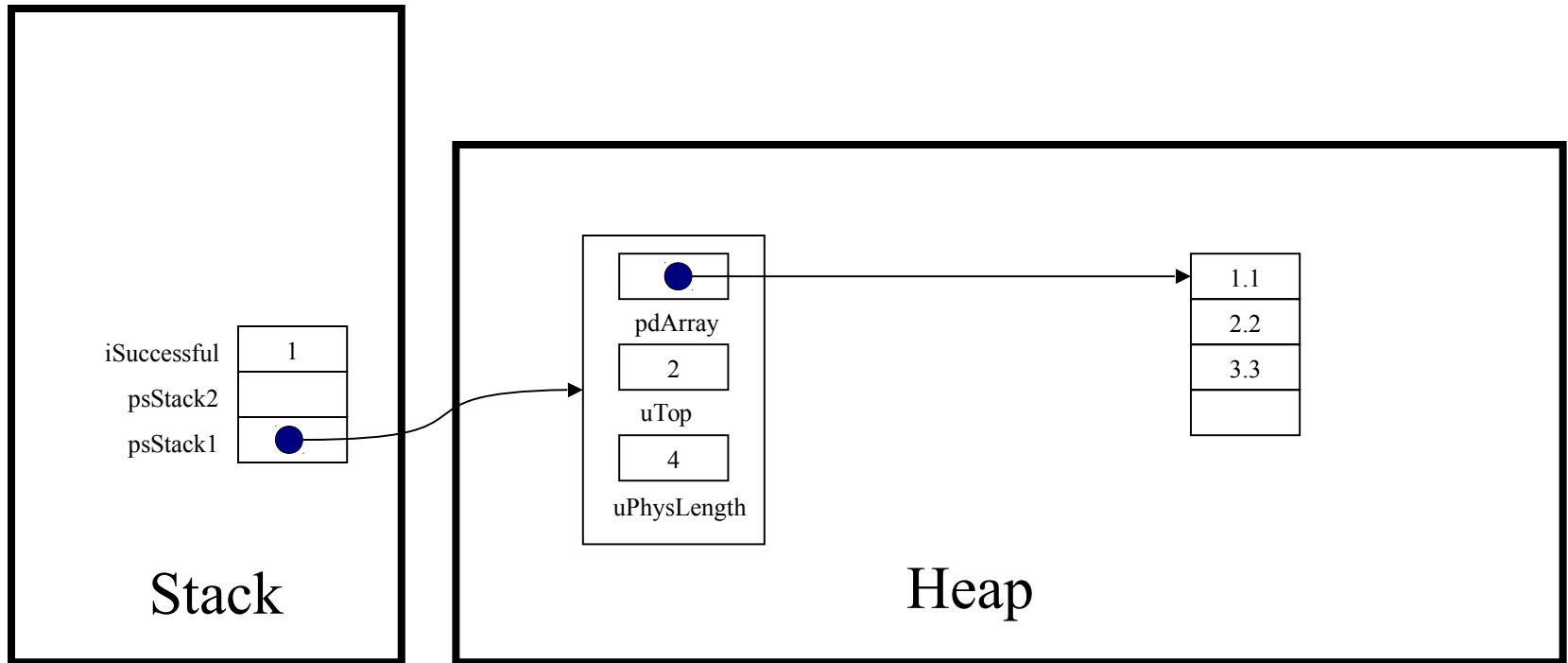
Princeton University
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Trace of teststack (Version 1)

```
printf("%g\n", Stack_pop(psStack1));
```



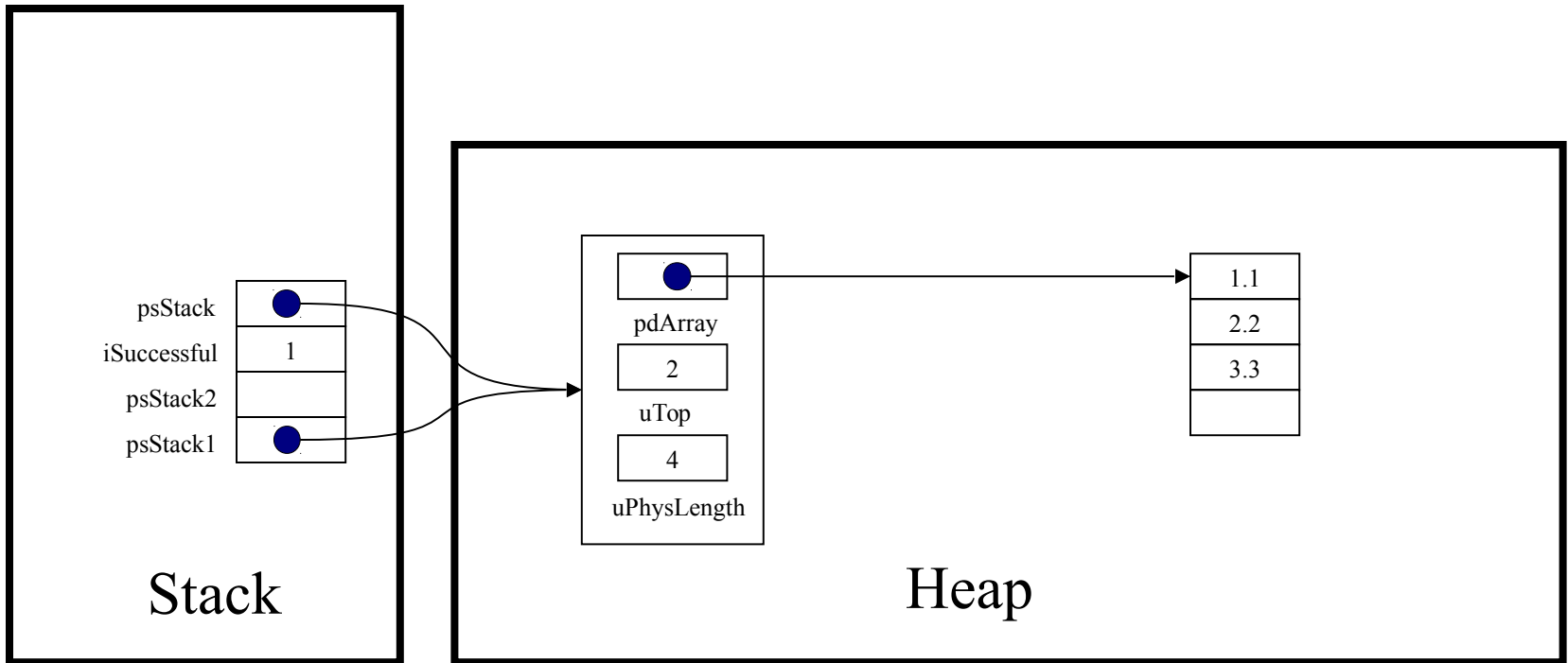
Princeton University
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack1))  
    ...
```



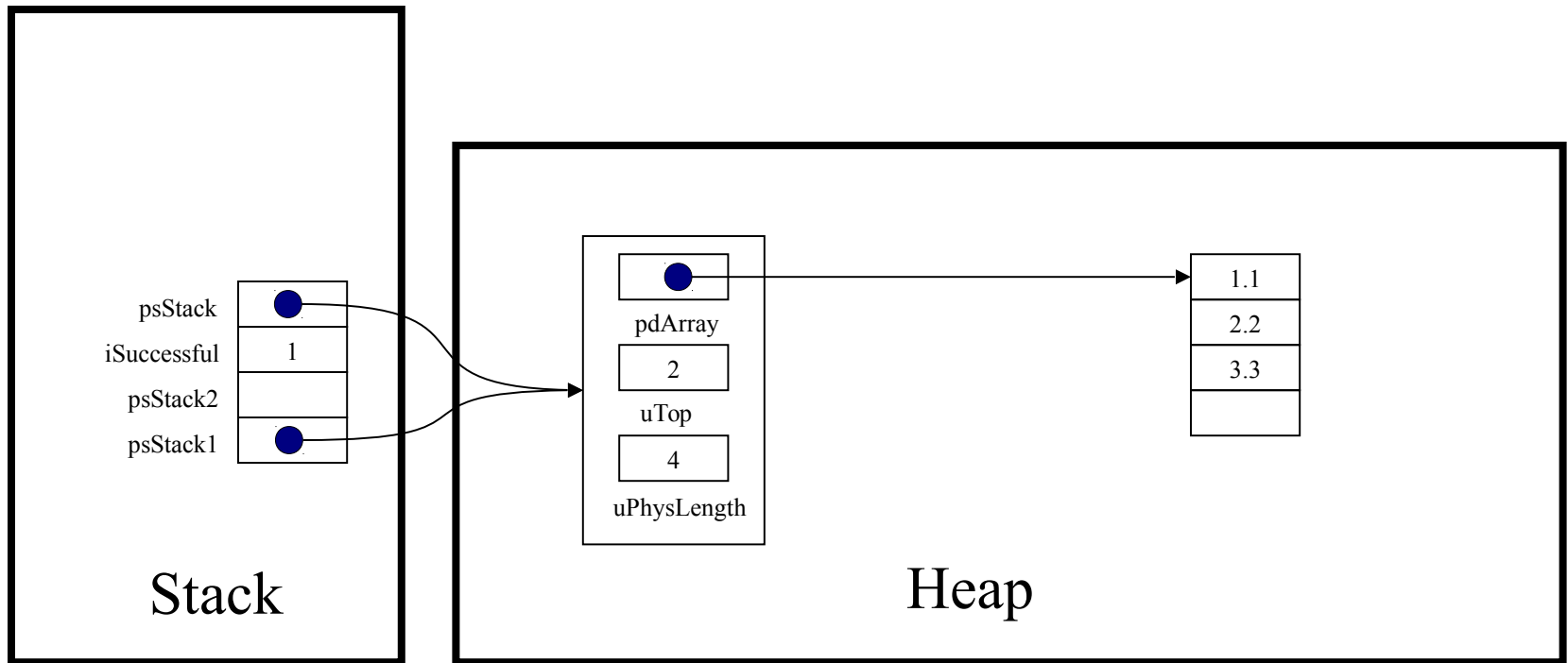
Princeton University
COS 217: Introduction to Programming Systems
Trace of teststack (Version 1)

```
int Stack_isEmpty(struct Stack *psStack)
```



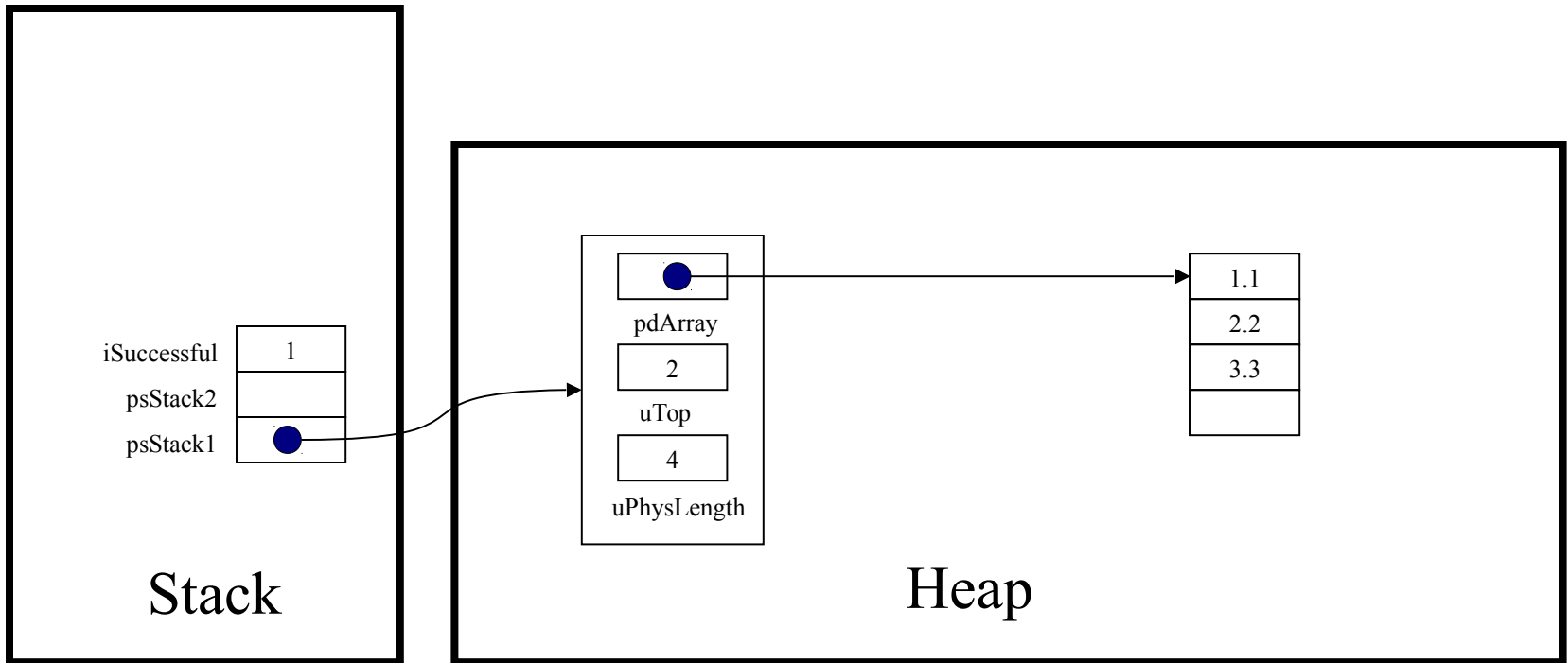
Princeton University
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



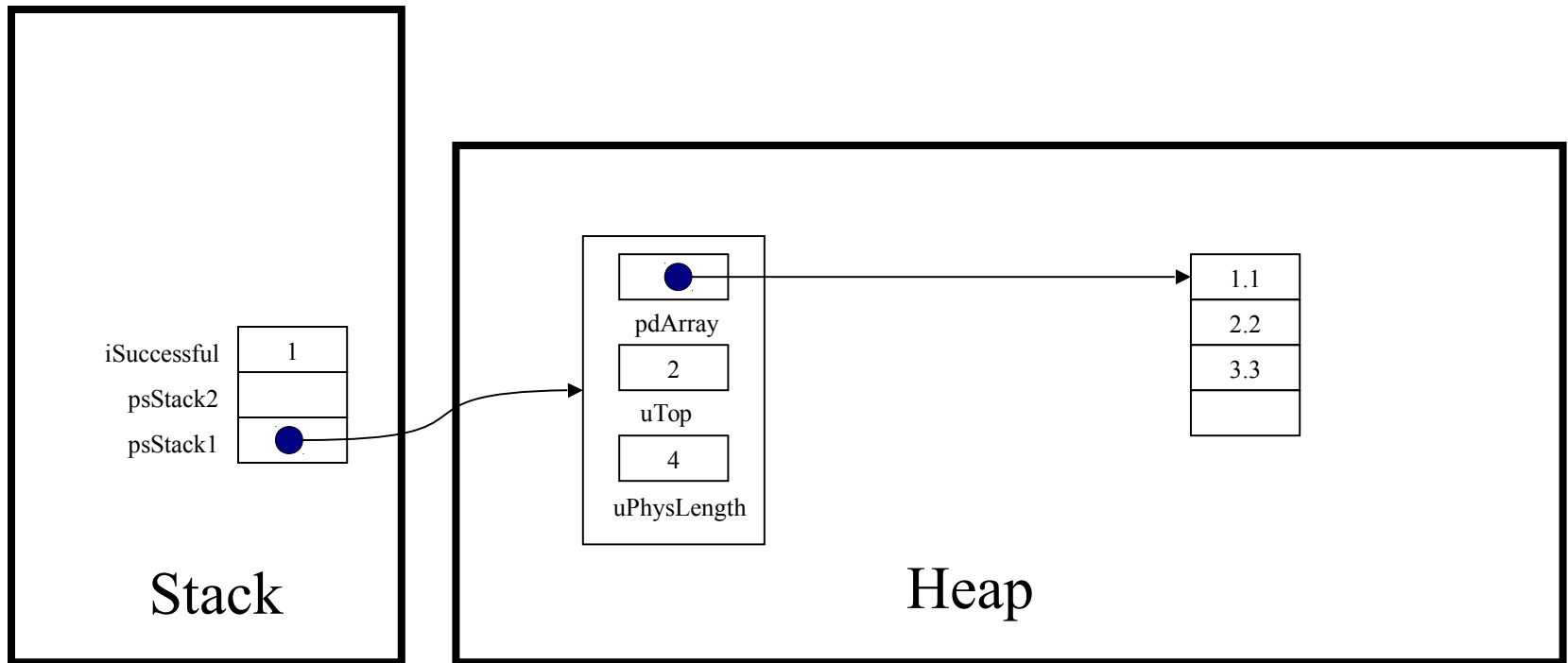
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Trace of teststack (Version 1)

```
return psStack->uTop == 0;
```



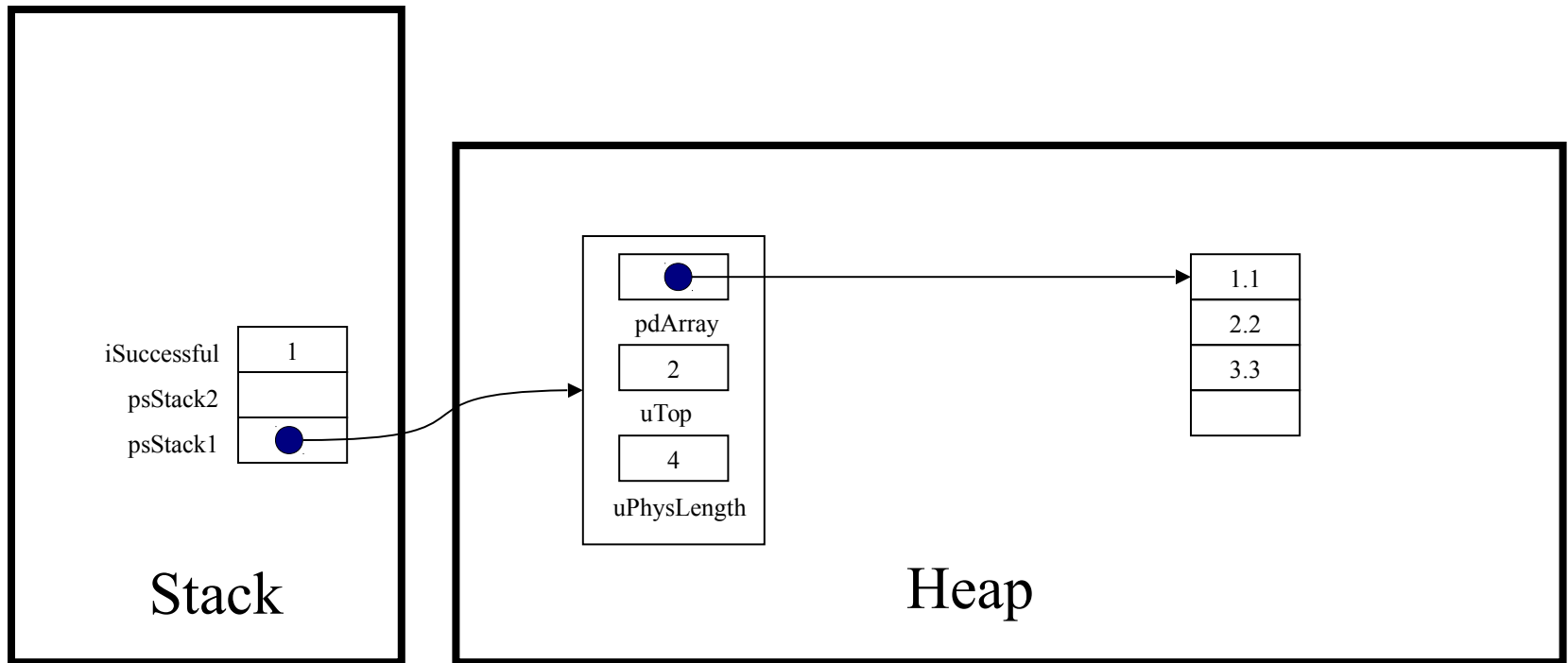
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack1))
```



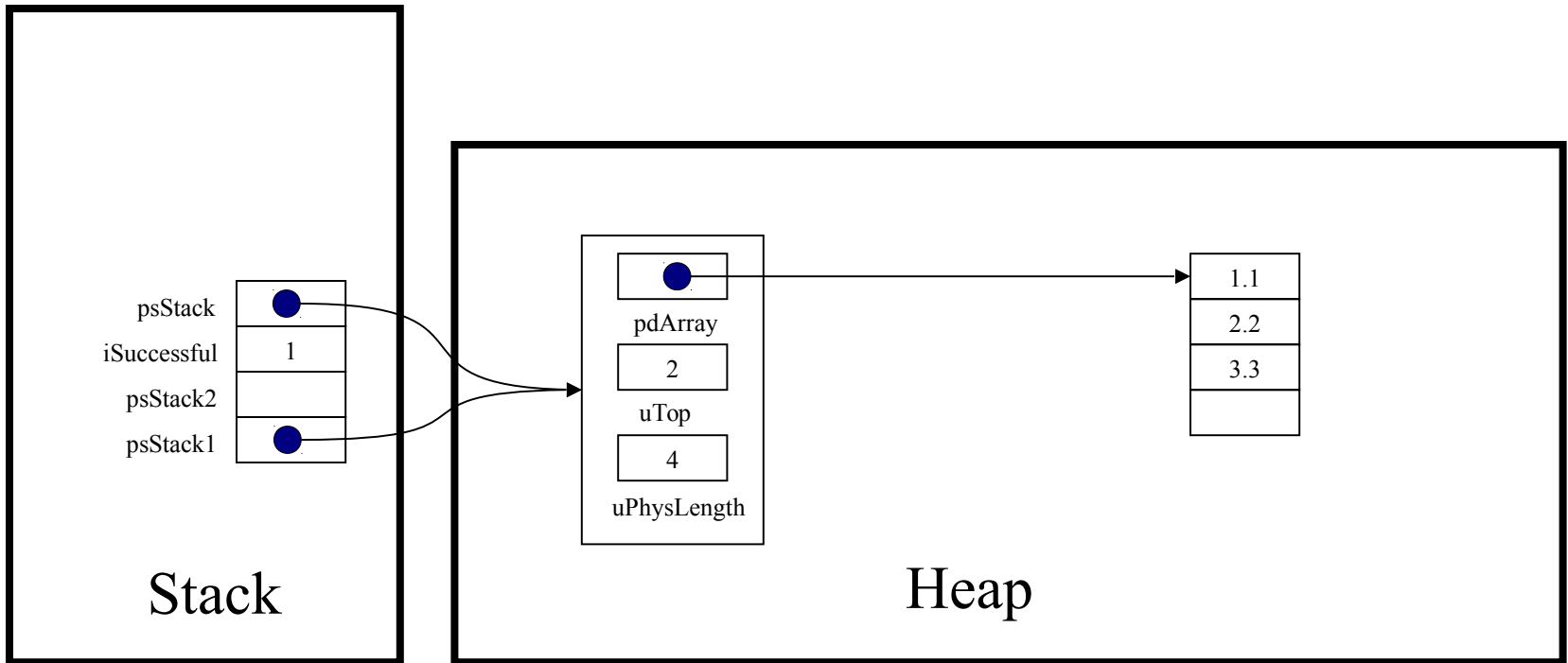
Princeton University
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Trace of teststack (Version 1)

```
printf("%g\n", Stack_pop(psStack1));
```



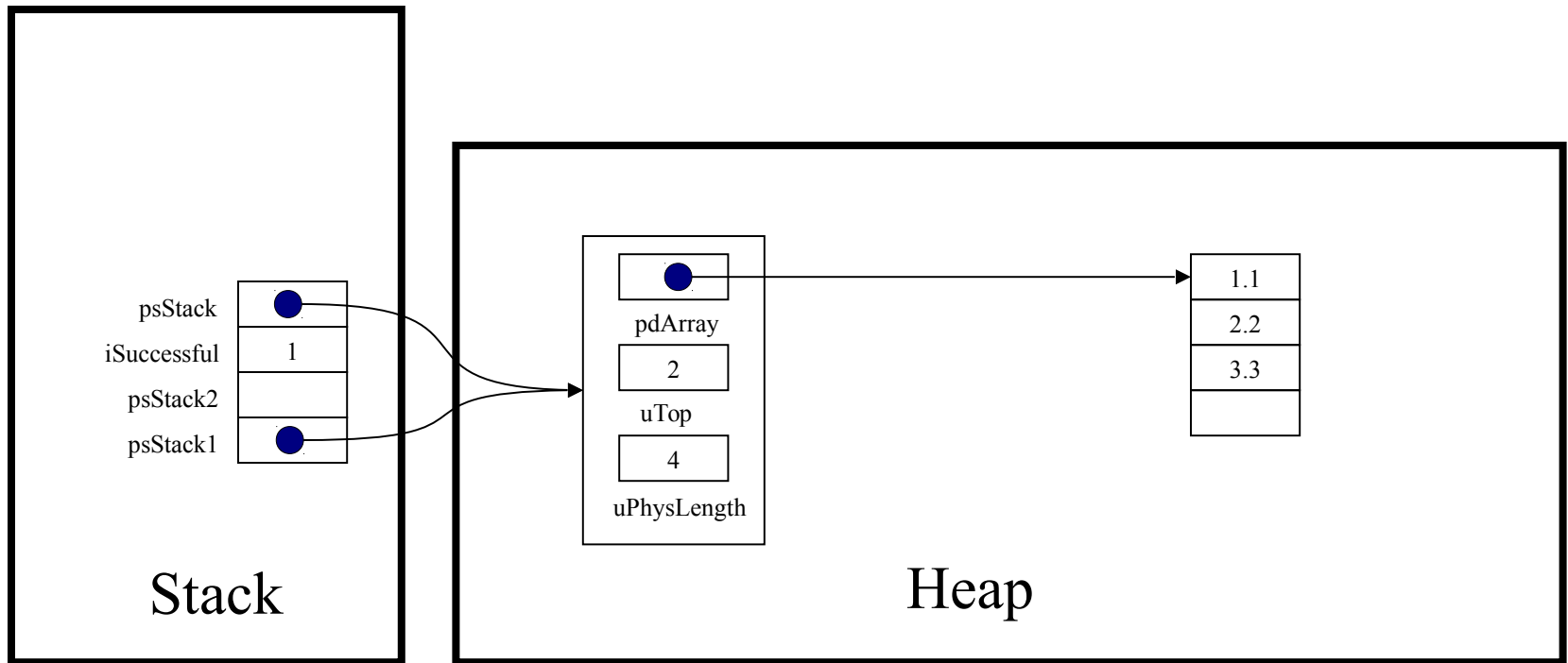
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Trace of teststack (Version 1)

```
double Stack_pop(struct Stack *psStack)
```



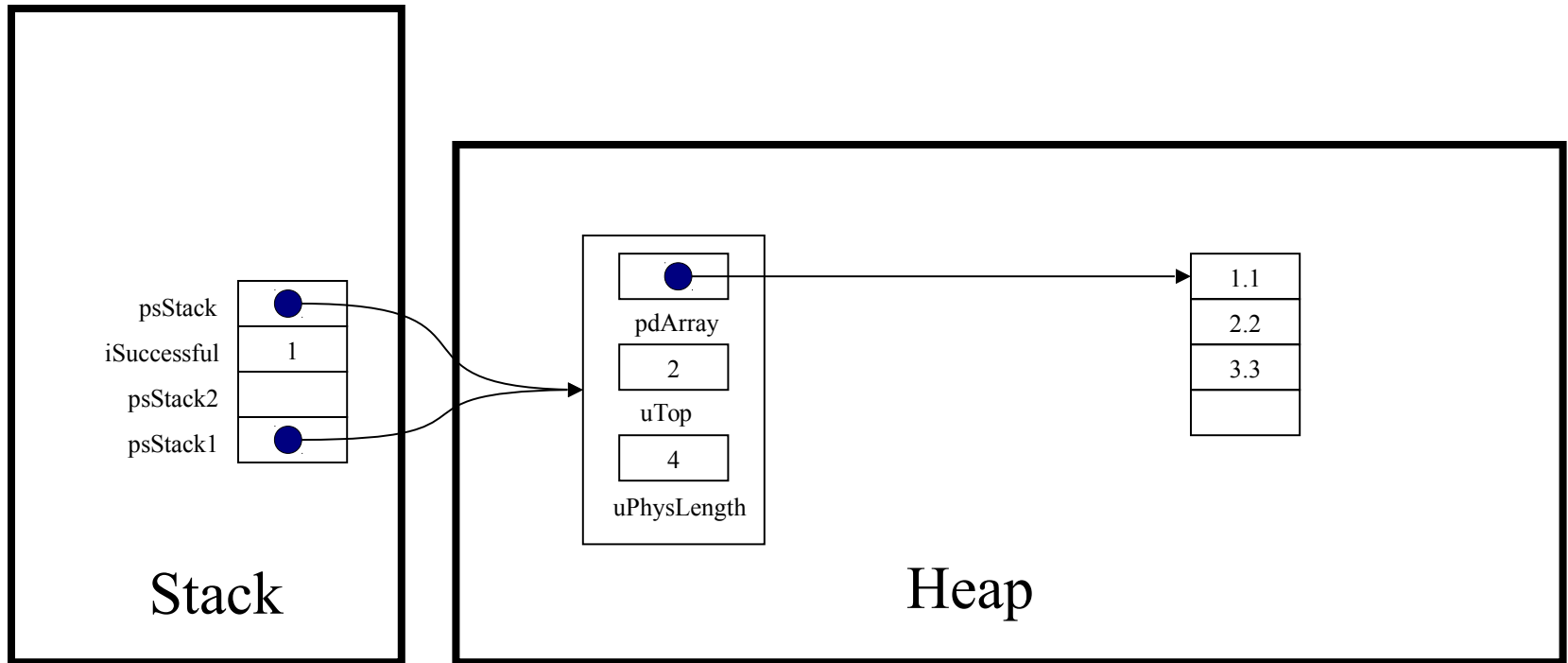
Princeton University
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



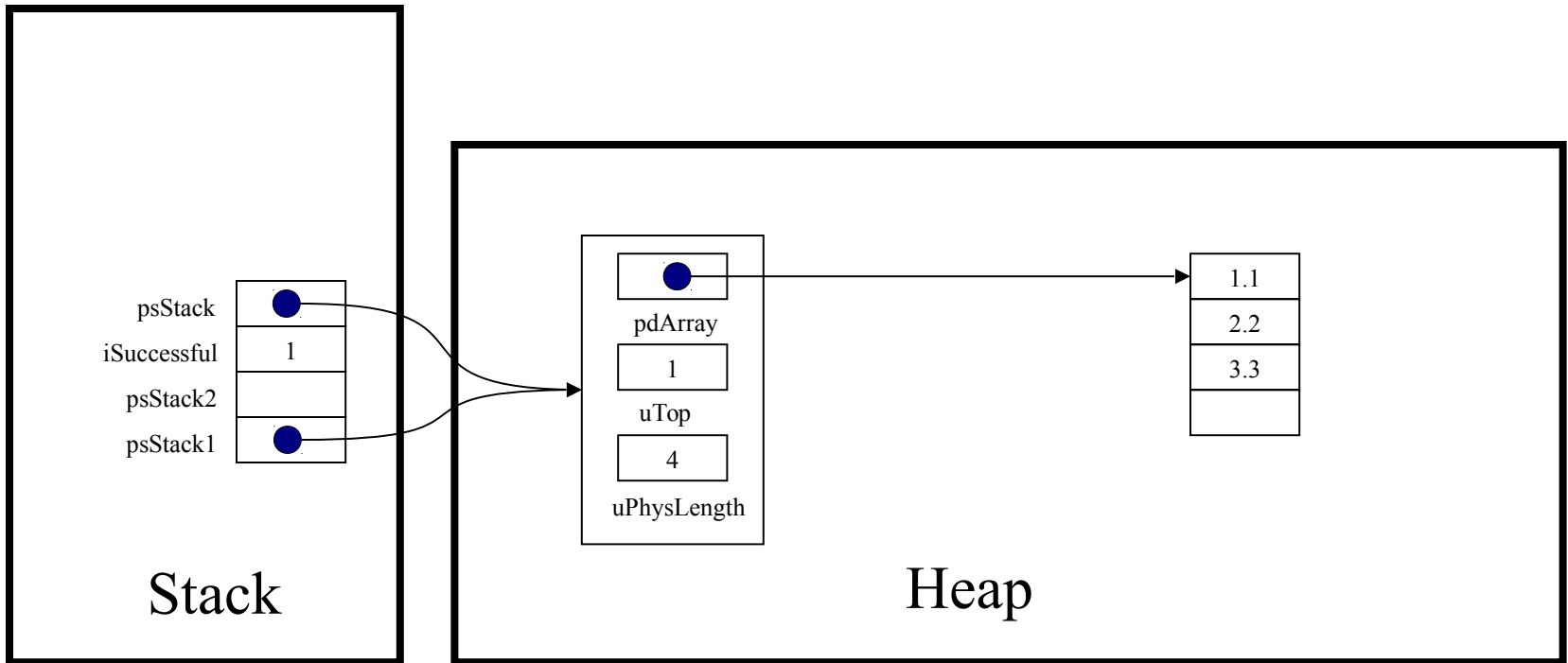
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Trace of teststack (Version 1)

```
assert (psStack->uTop > 0);
```



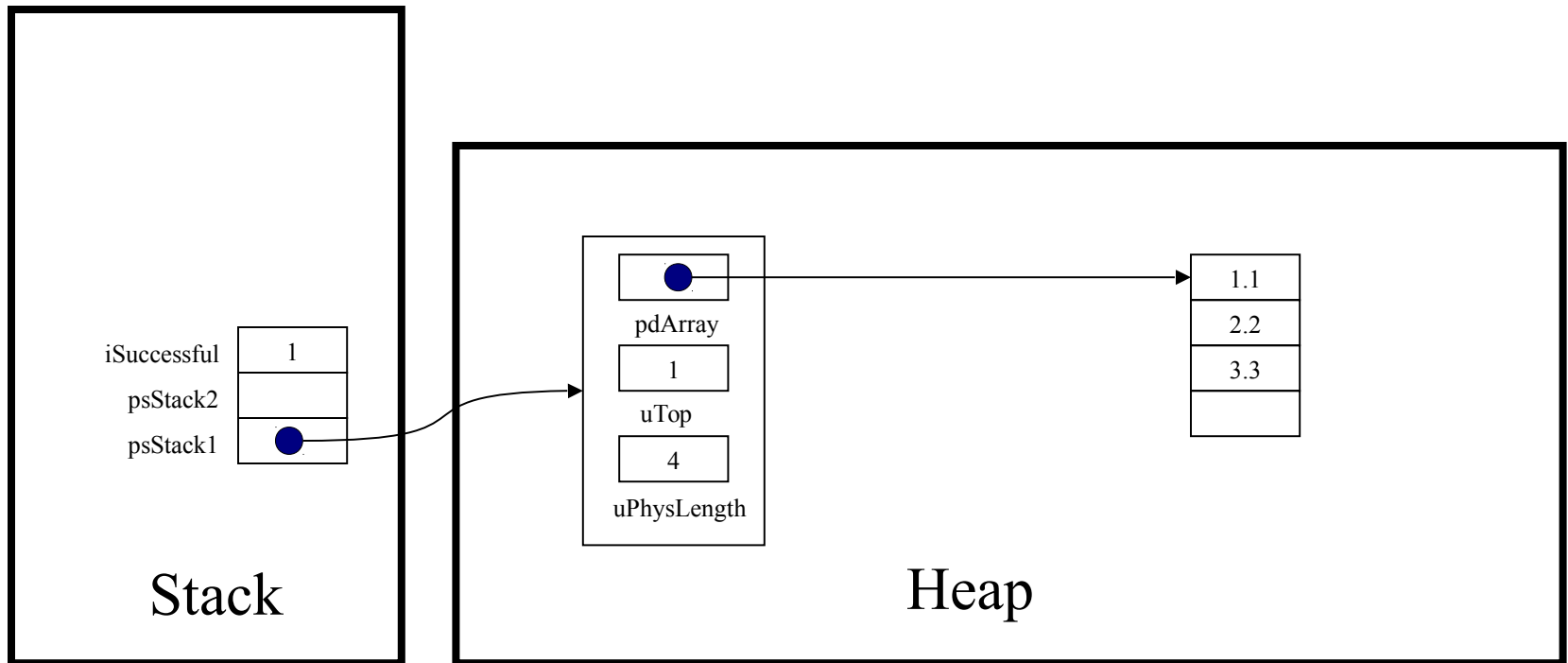
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Trace of teststack (Version 1)

```
(psStack->uTop) --;
```



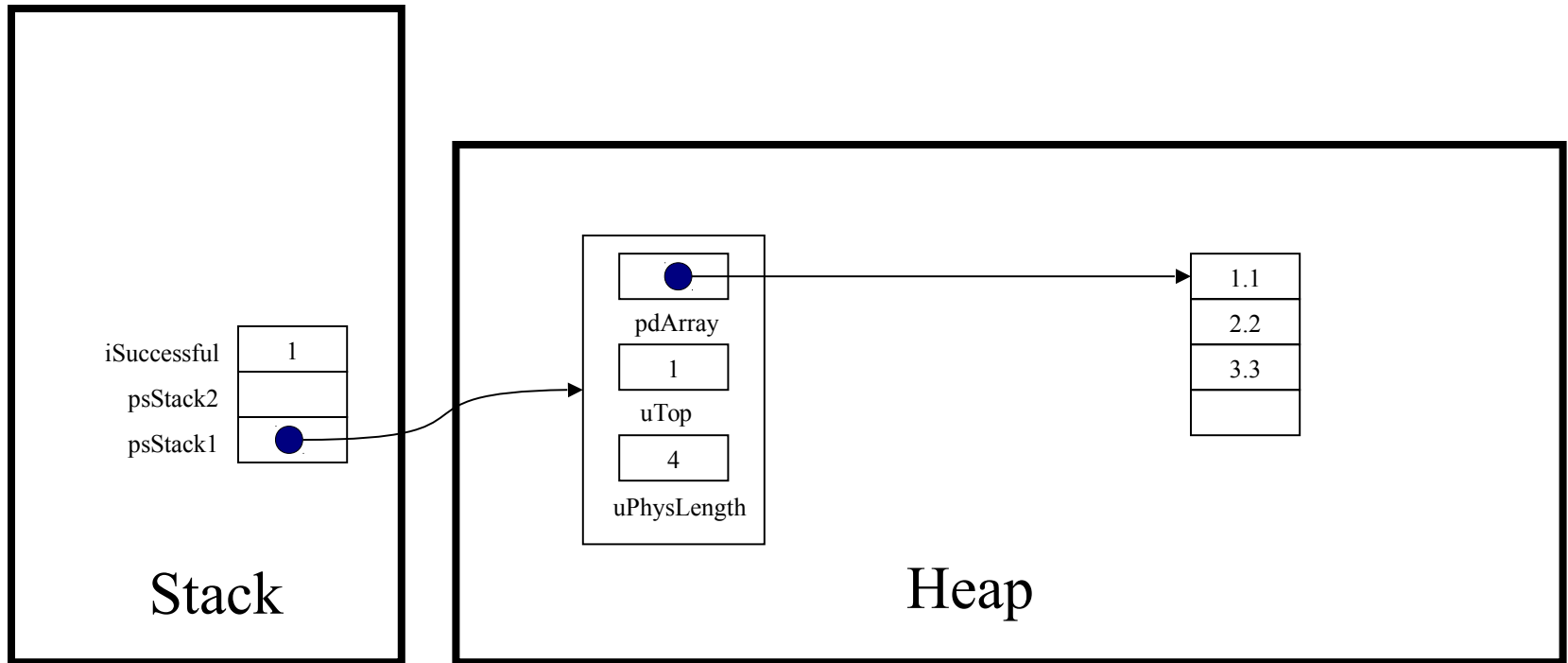
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Trace of teststack (Version 1)

```
return (psStack->pdArray)[psStack->uTop];
```



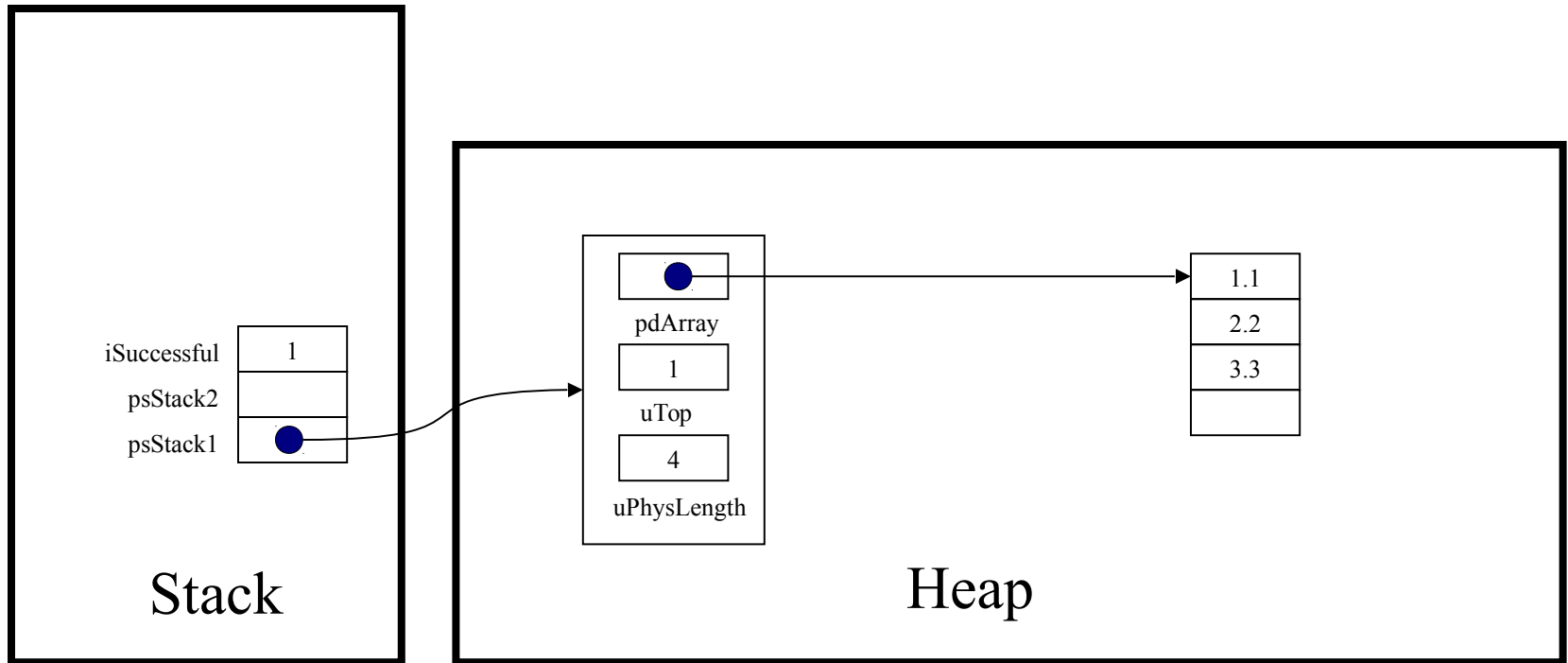
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Trace of teststack (Version 1)

```
printf("%g\n", Stack_pop(psStack1));
```



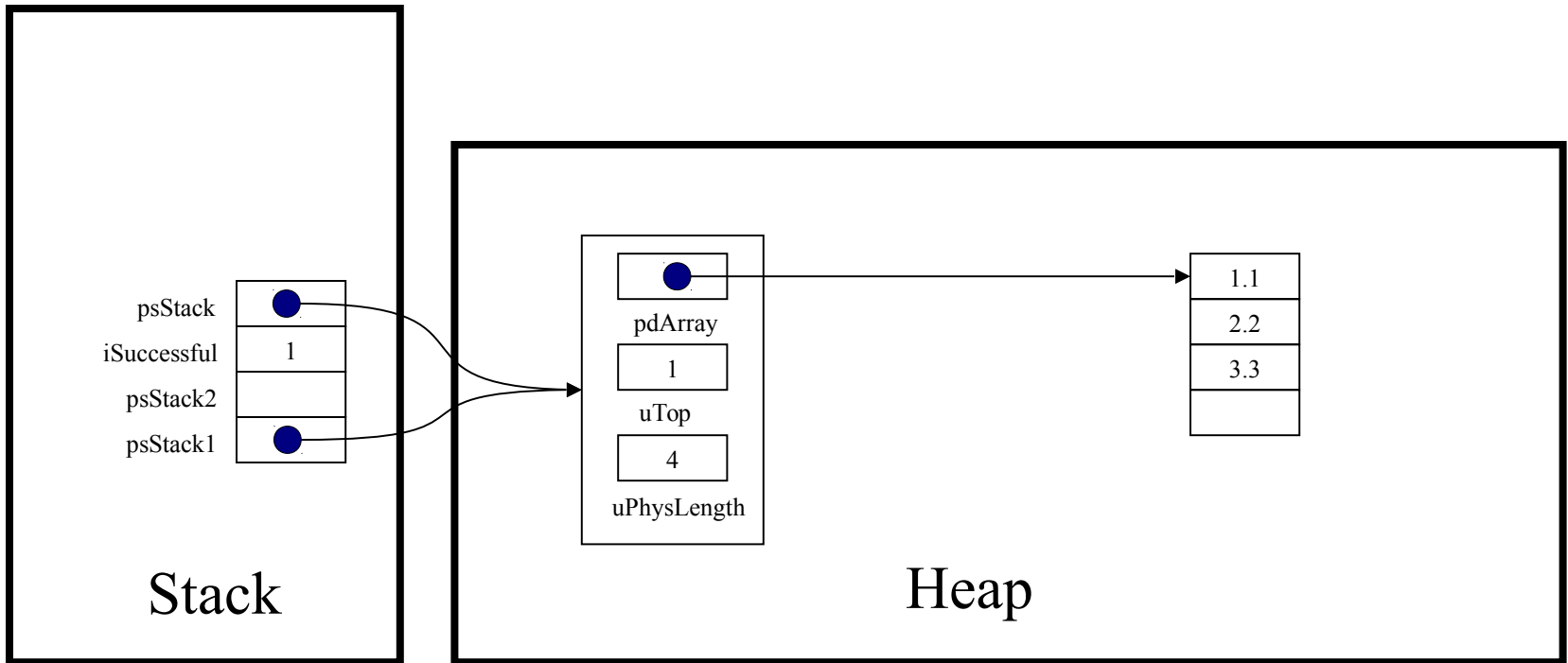
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack1))  
    ...
```



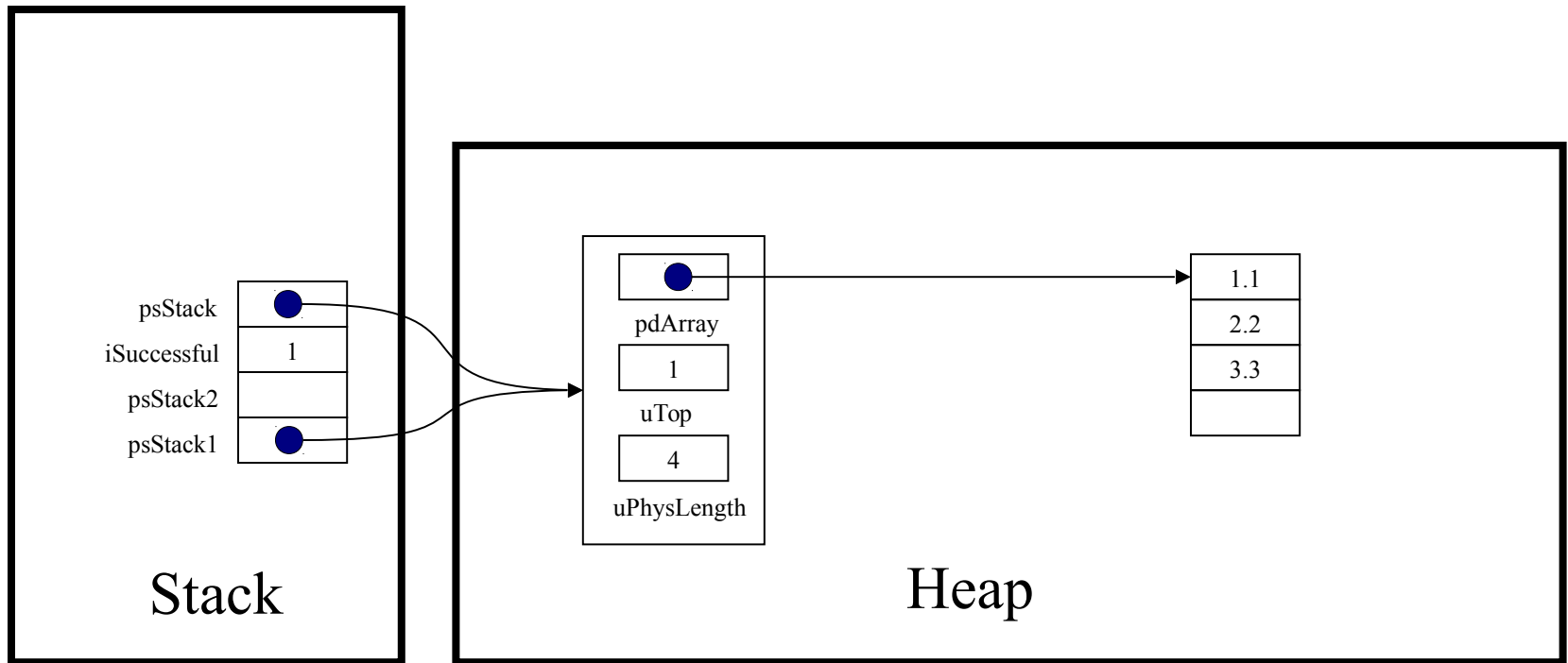
Princeton University
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Trace of teststack (Version 1)

```
int Stack_isEmpty(struct Stack *psStack)
```



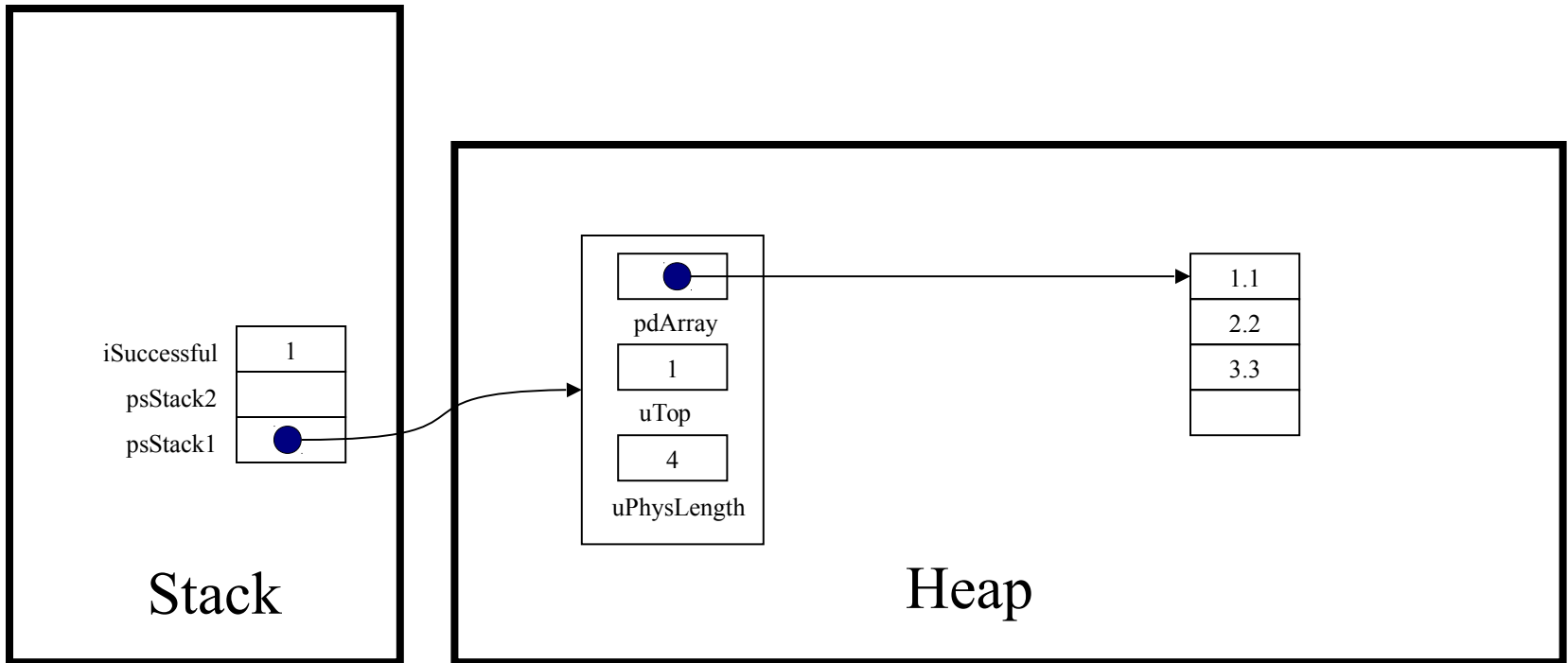
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



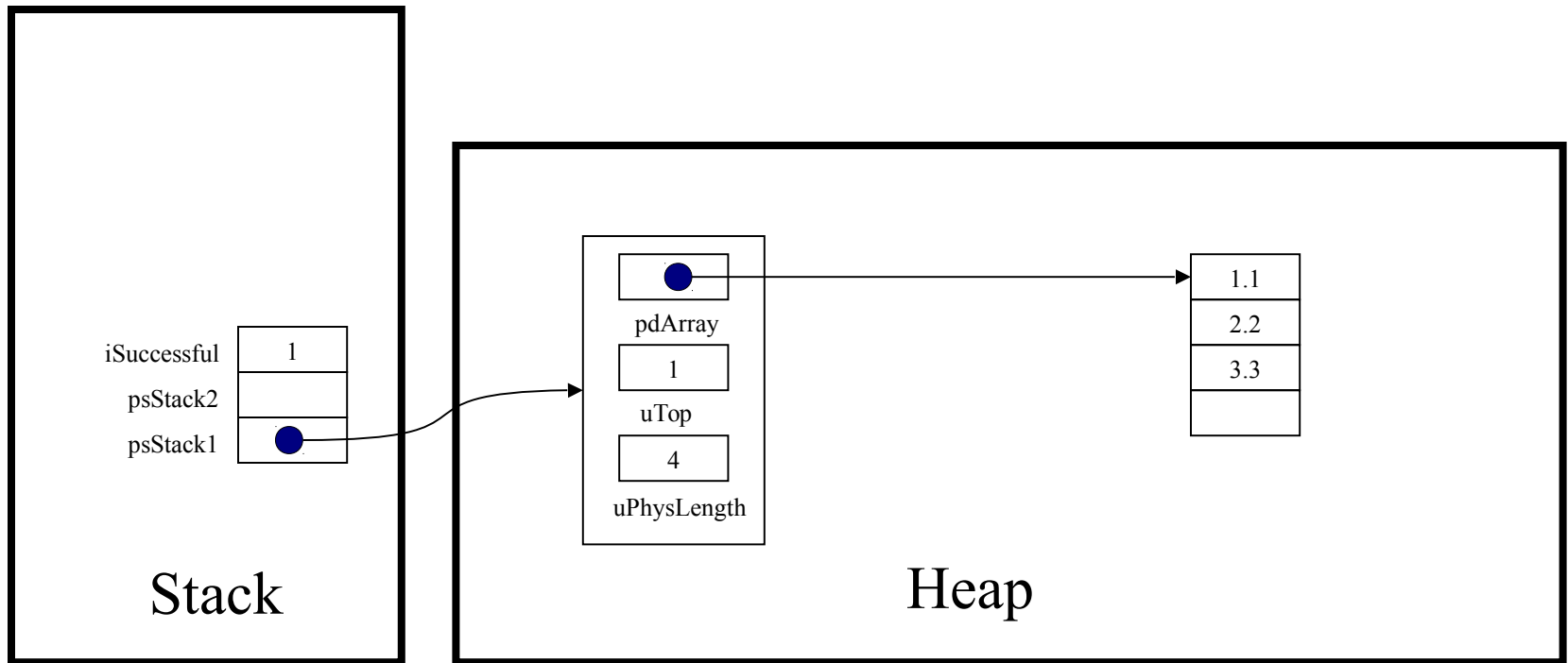
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Trace of teststack (Version 1)

```
return psStack->uTop == 0;
```



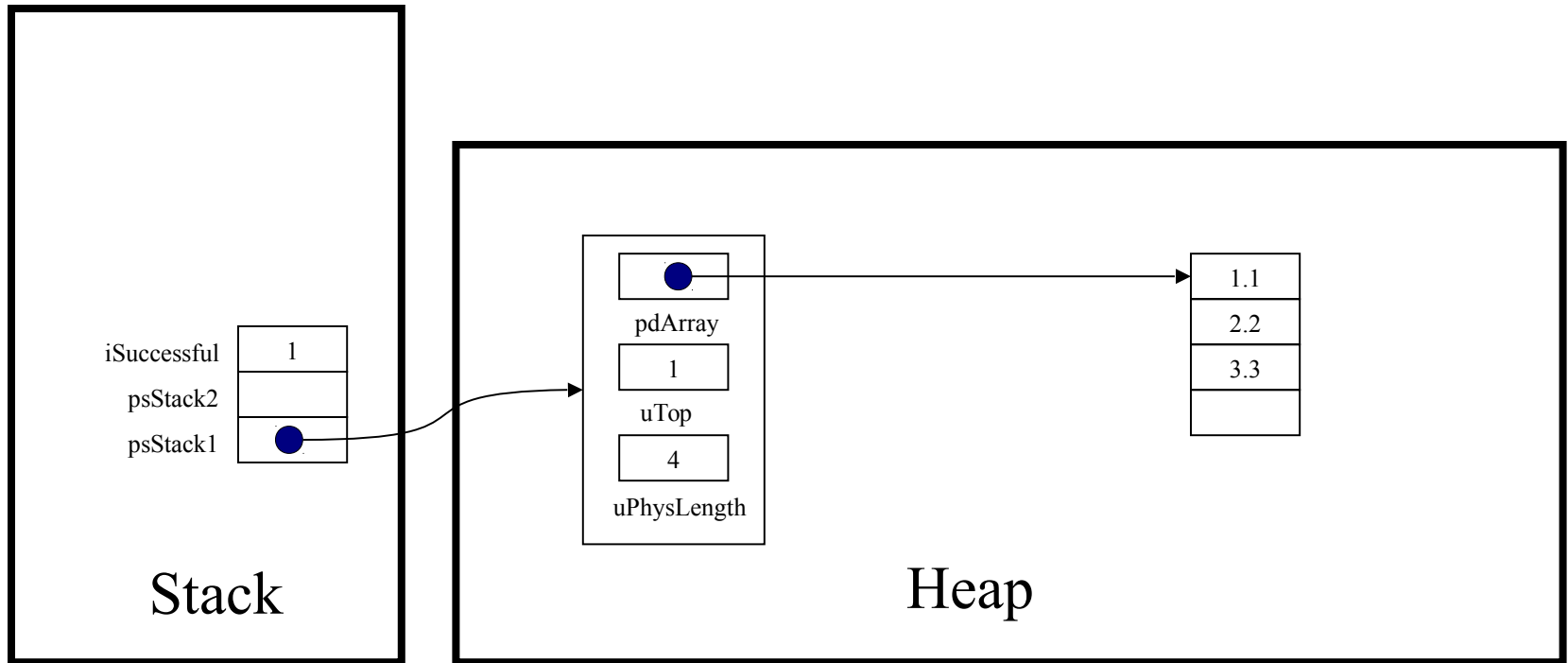
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack1))
```



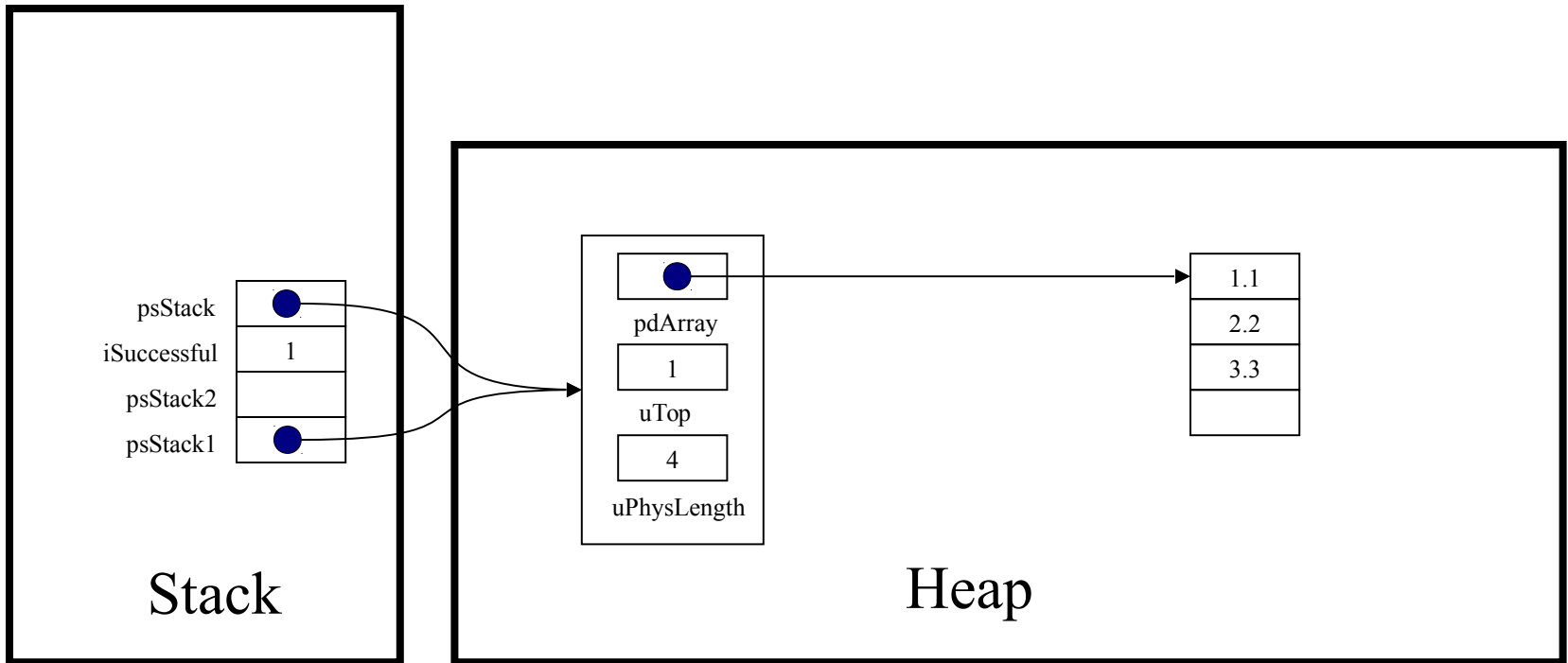
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Trace of teststack (Version 1)

```
printf("%g\n", Stack_pop(psStack1));
```



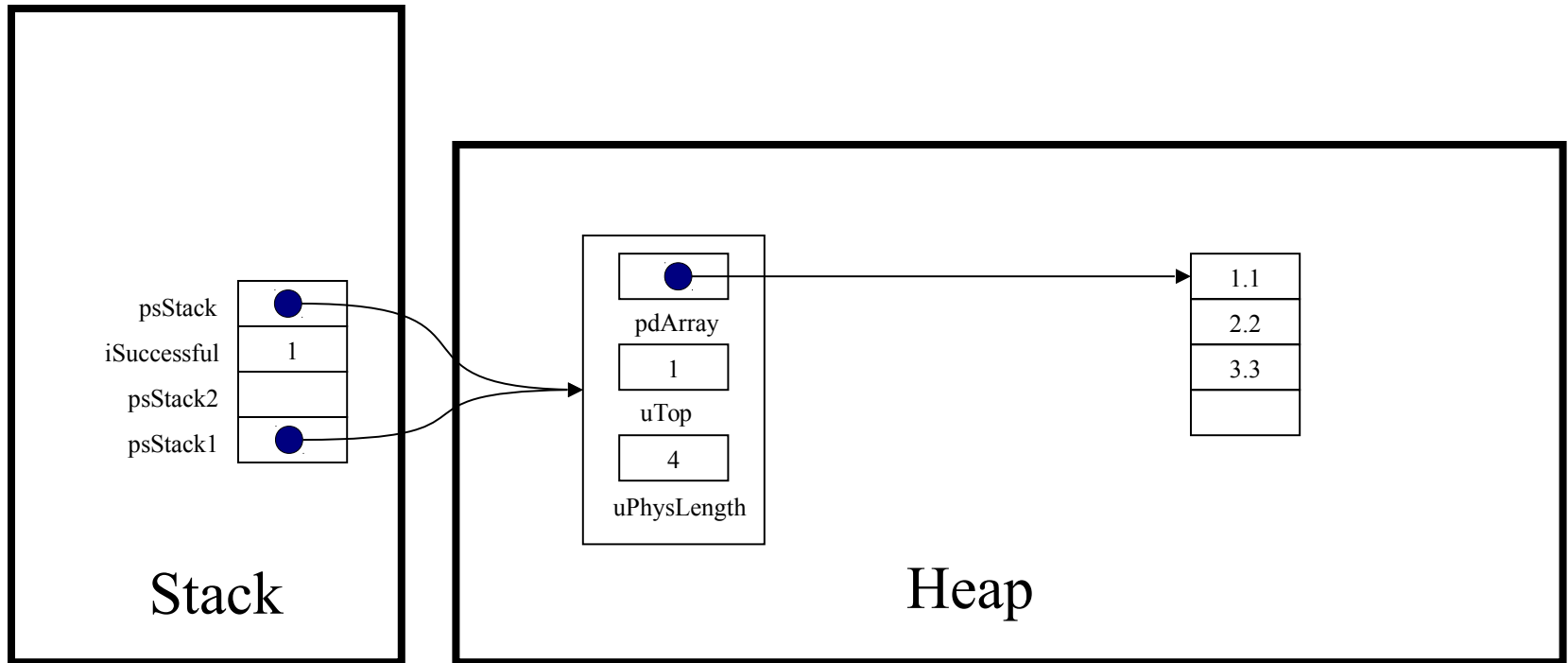
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Trace of teststack (Version 1)

```
double Stack_pop(struct Stack *psStack)
```



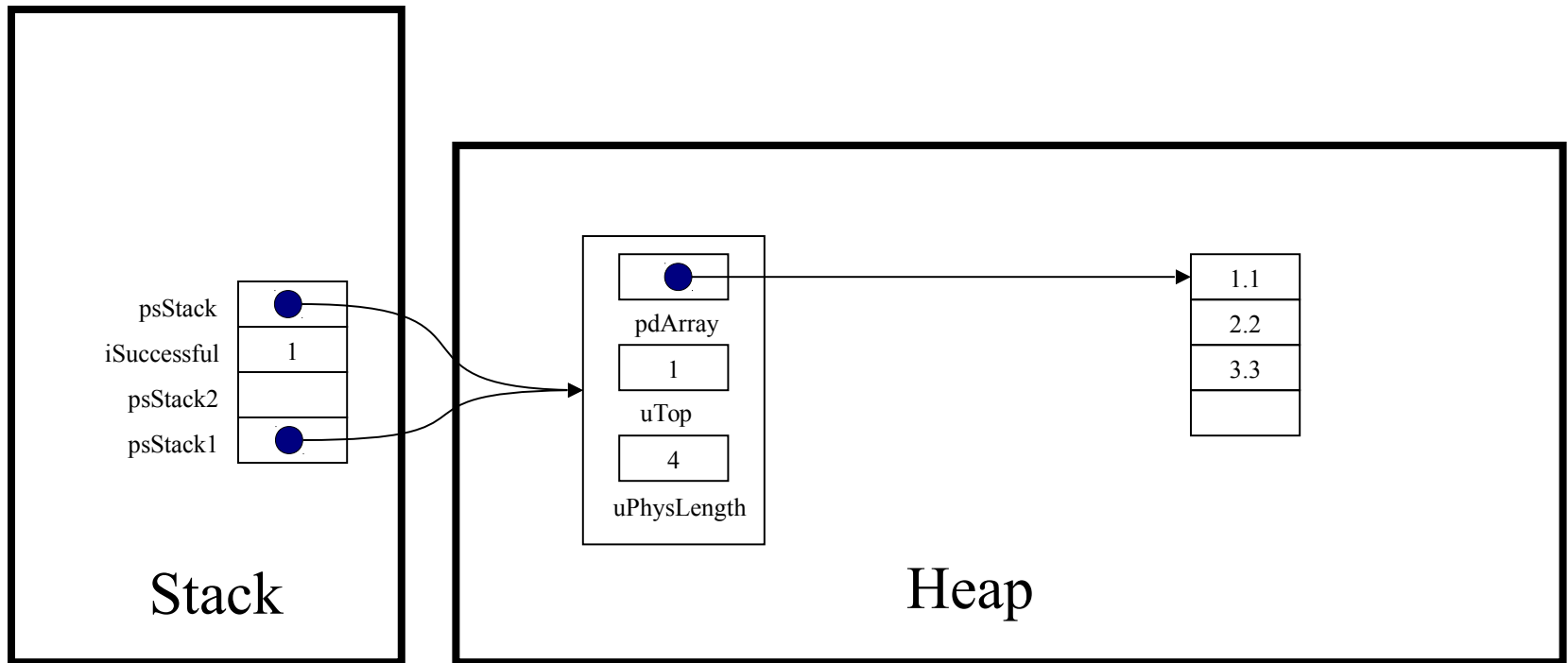
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



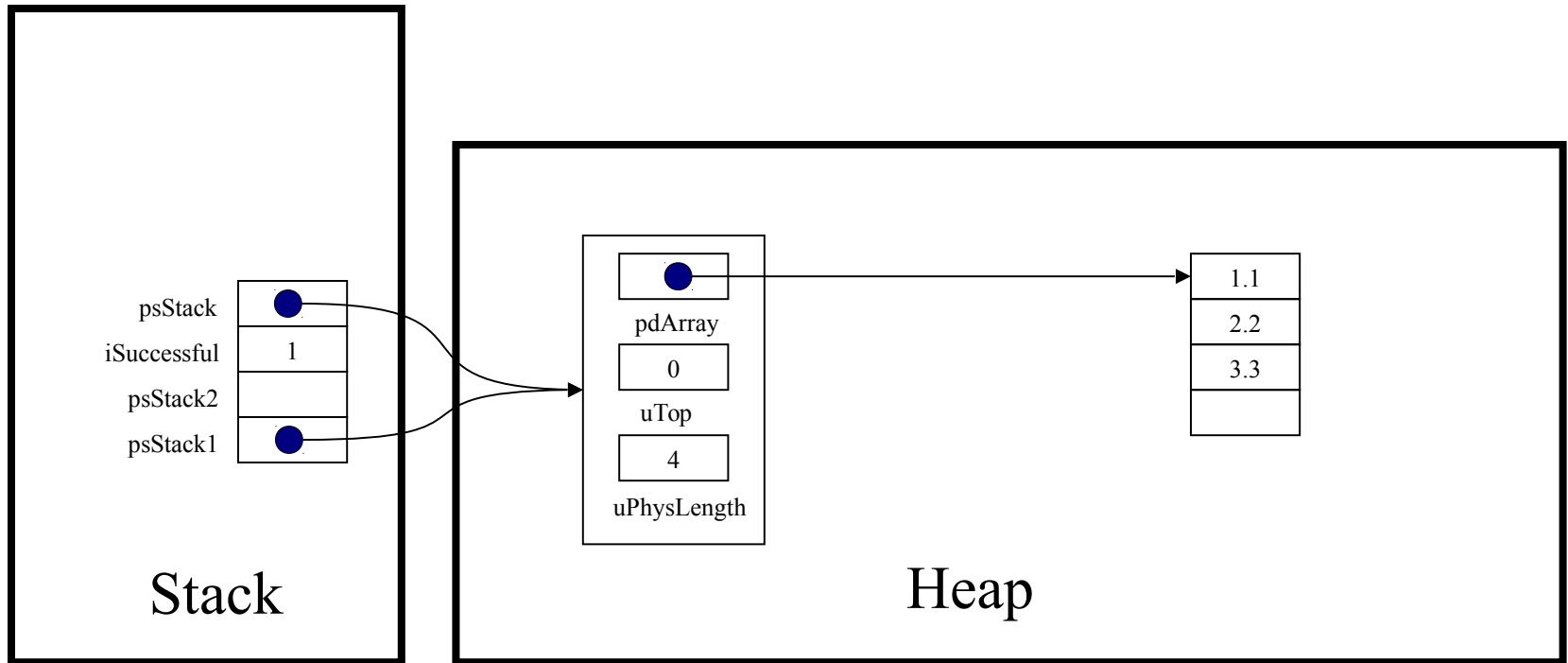
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Trace of teststack (Version 1)

```
assert (psStack->uTop > 0);
```



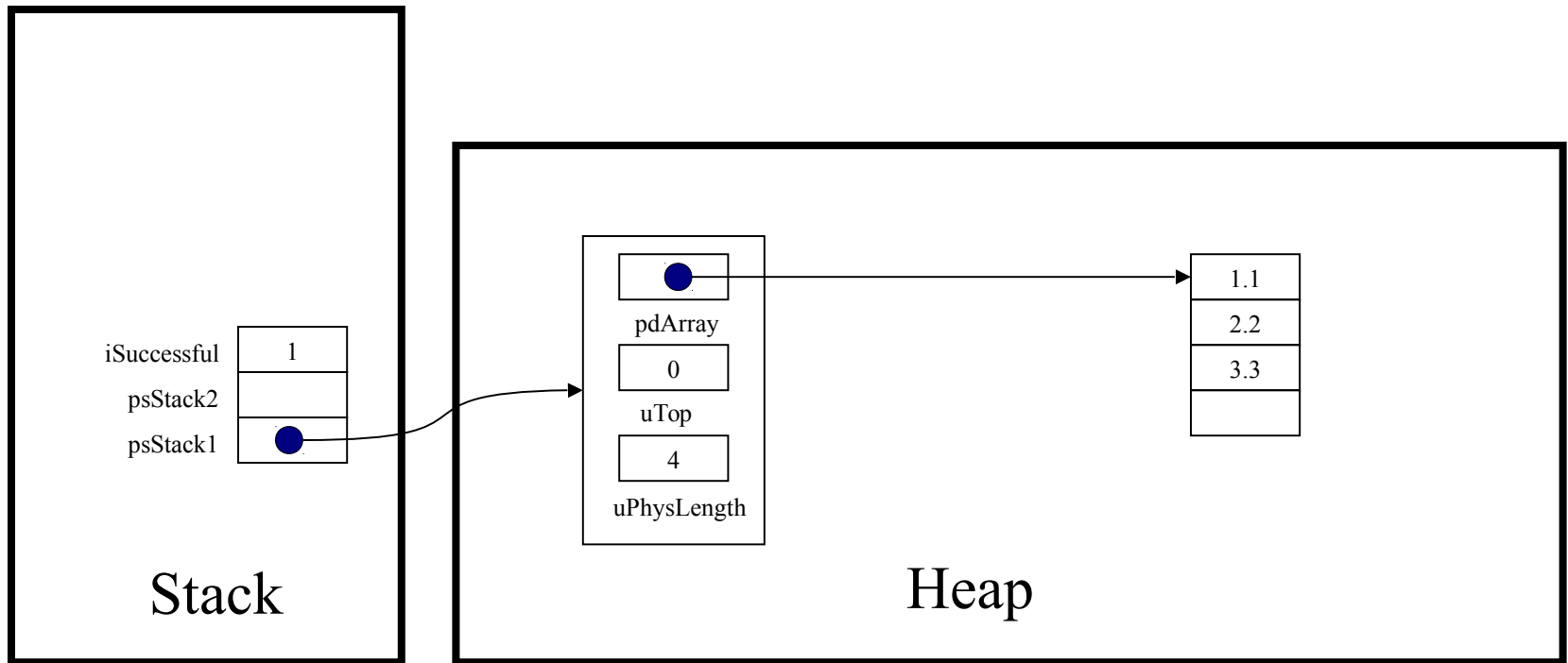
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Trace of teststack (Version 1)

```
(psStack->uTop) --;
```



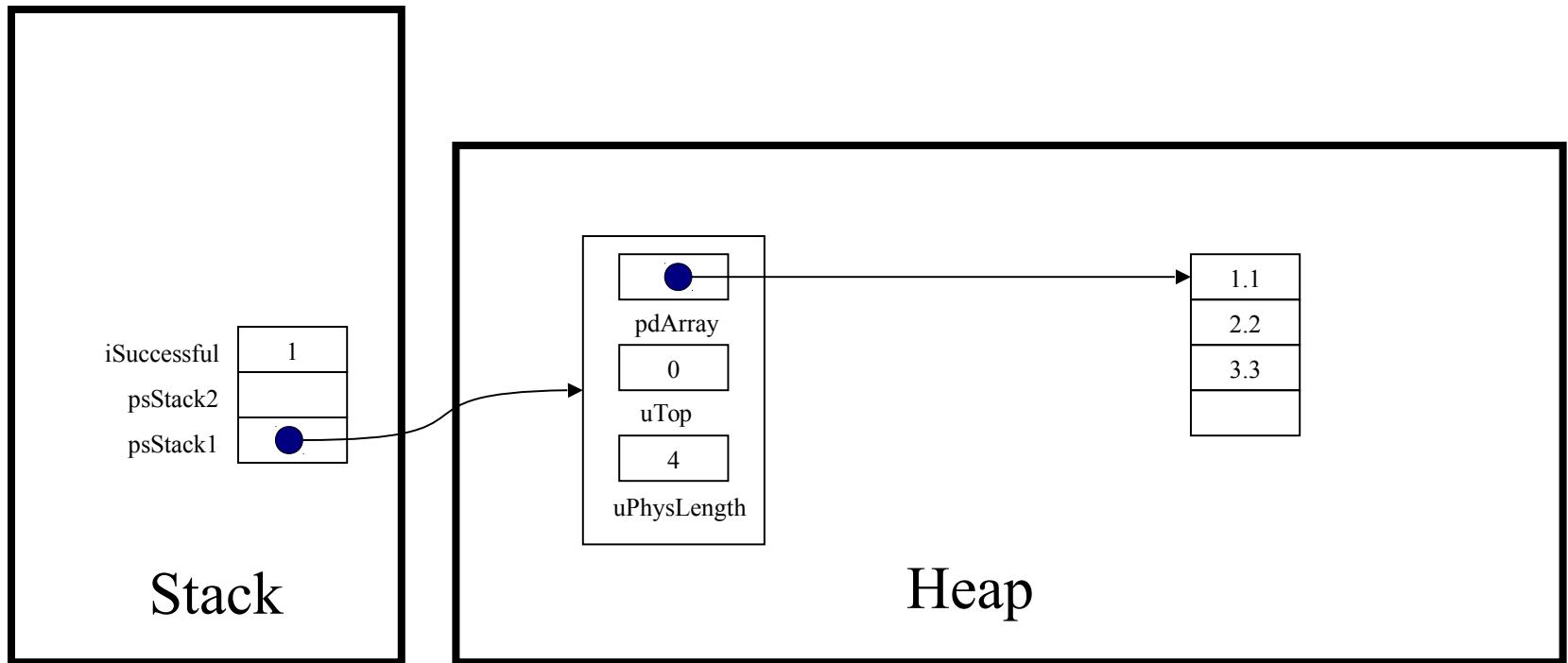
Princeton University
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Trace of teststack (Version 1)

```
return (psStack->pdArray) [psStack->uTop];
```



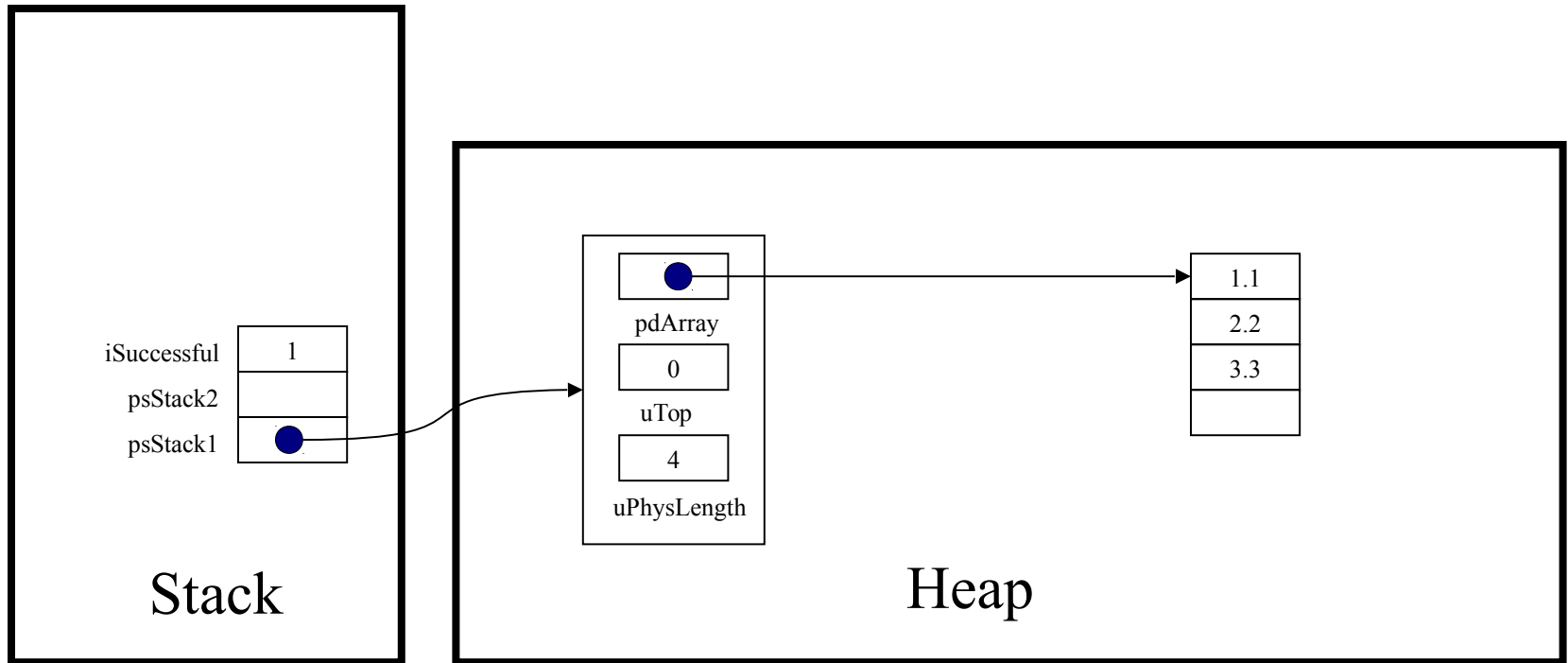
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Trace of teststack (Version 1)

```
printf("%g\n", Stack_pop(psStack1));
```



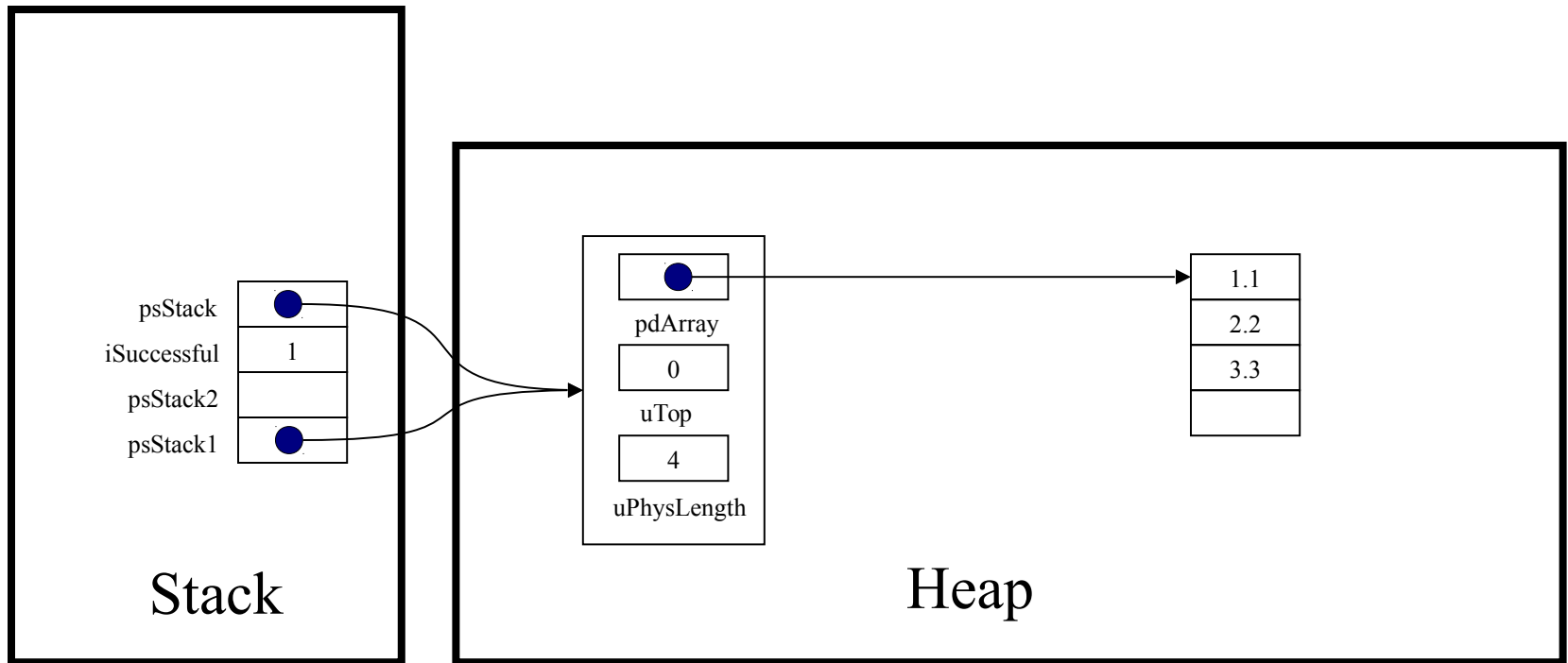
Princeton University
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack1))  
    ...
```



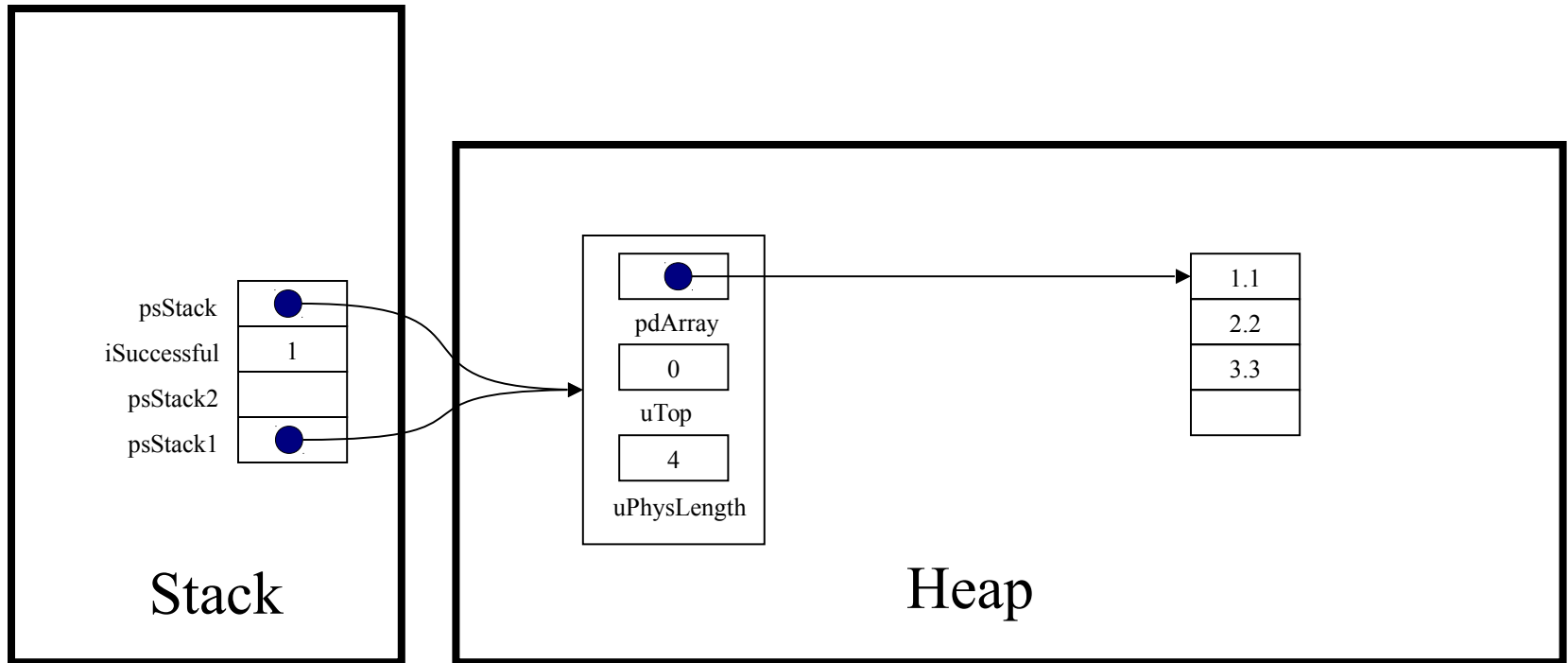
Princeton University
COS 217: Introduction to Programming Systems
Trace of teststack (Version 1)

```
int Stack_isEmpty(struct Stack *psStack)
```



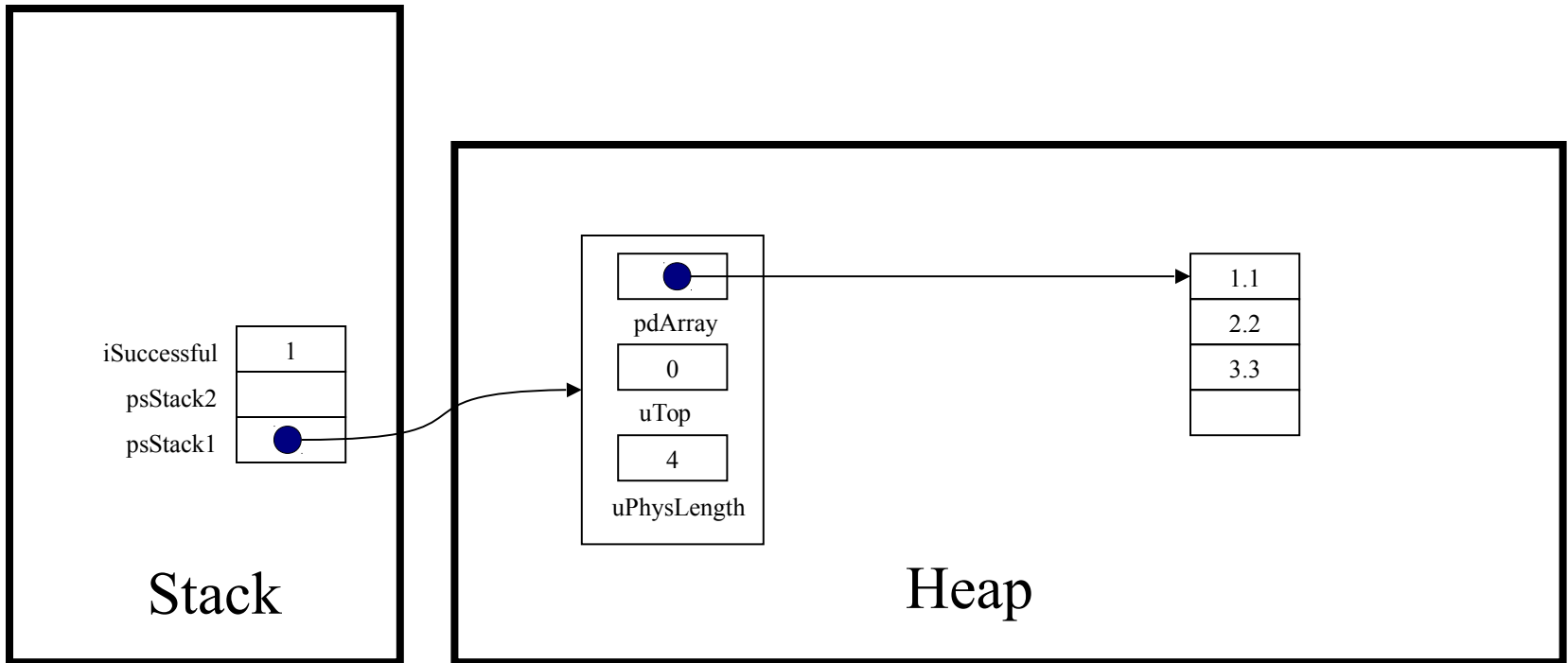
Princeton University
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



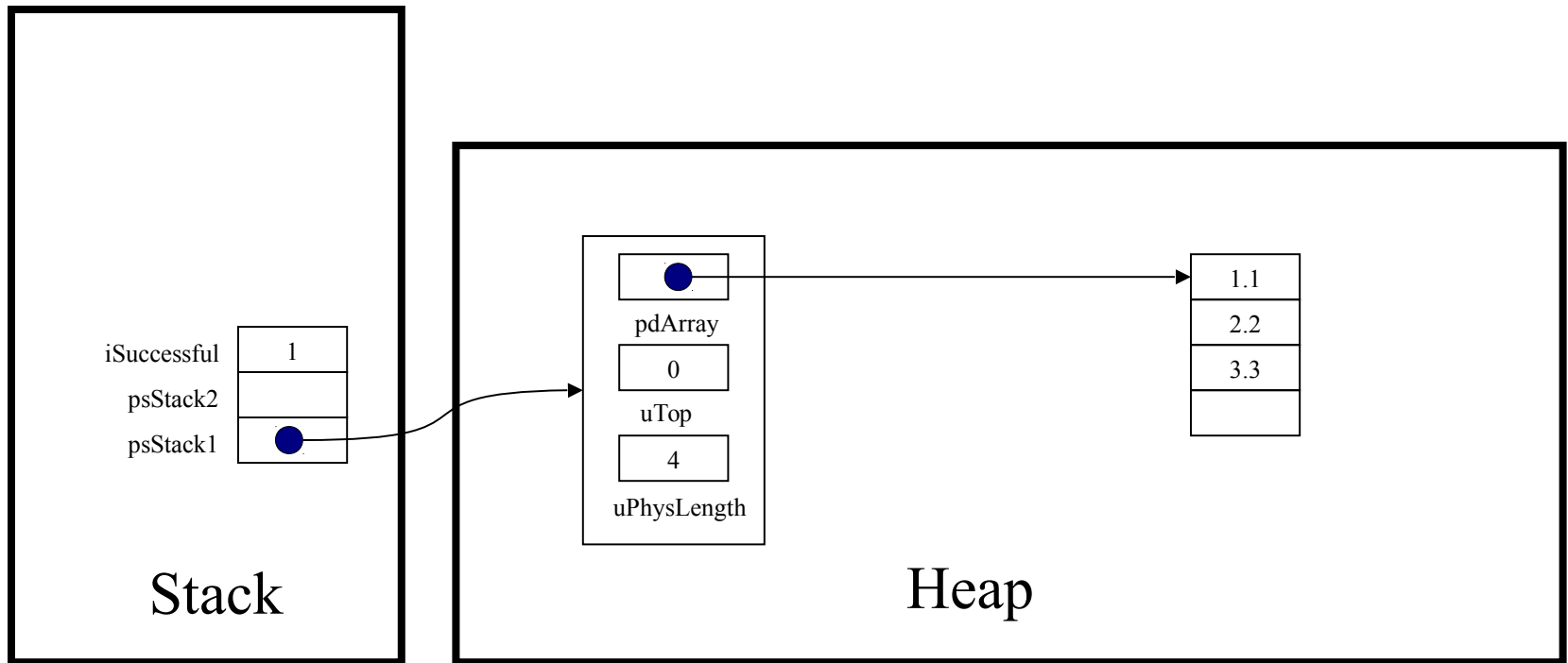
Princeton University
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Trace of teststack (Version 1)

```
return psStack->uTop == 0;
```



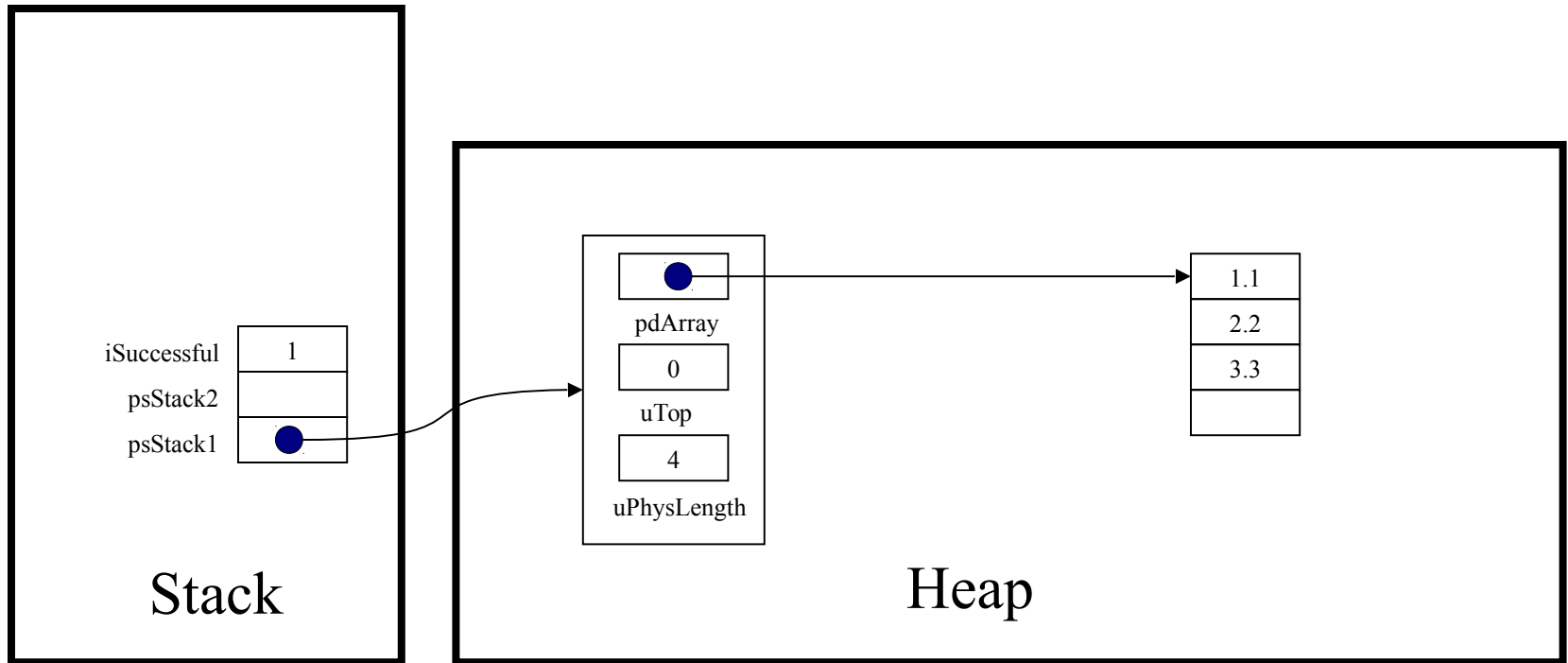
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack1))
```



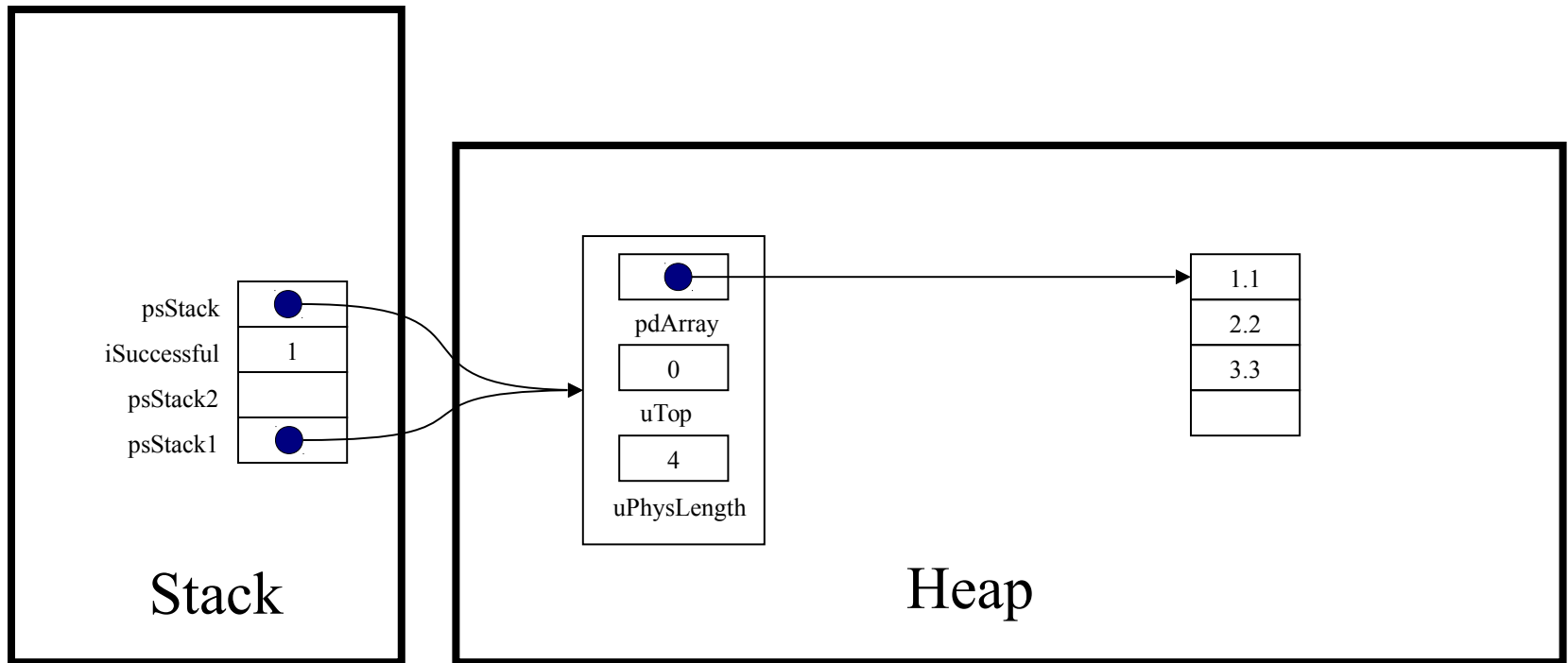
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Trace of teststack (Version 1)

```
Stack_free(psStack1);
```



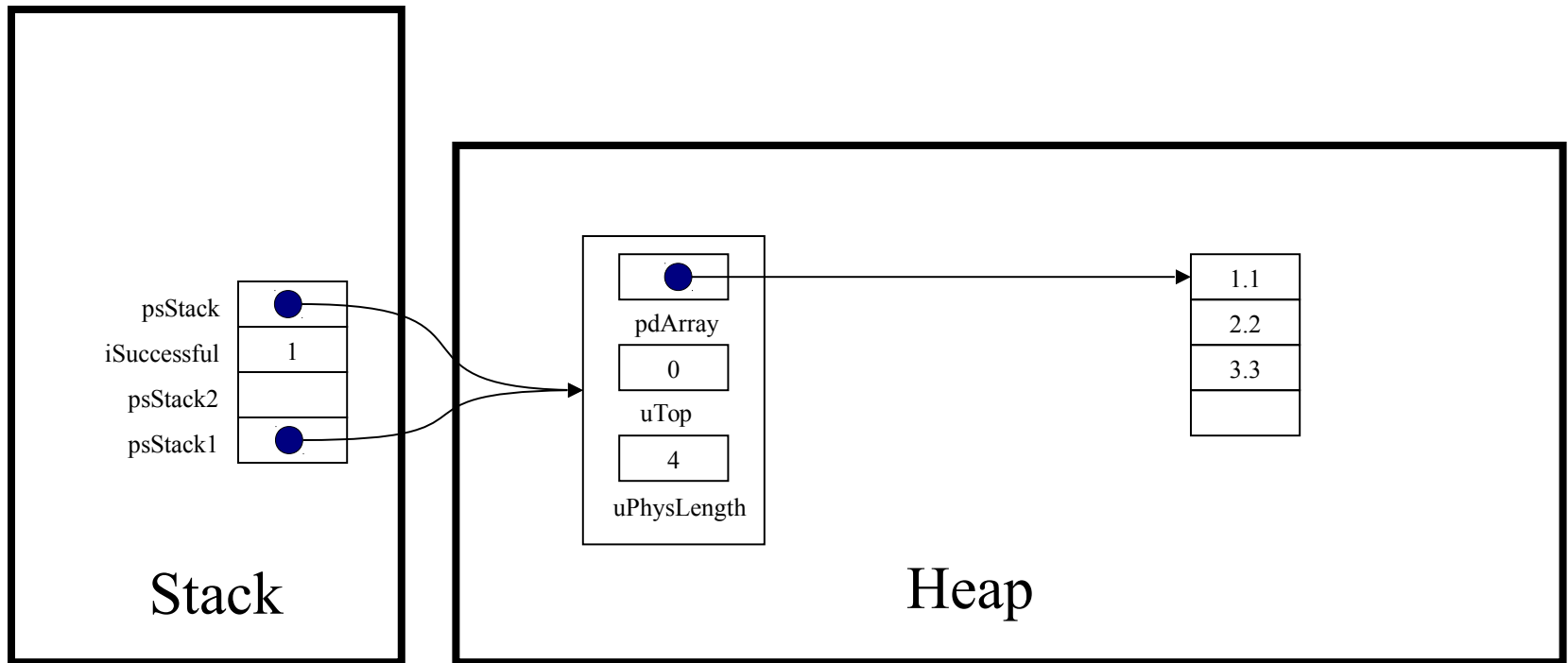
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Trace of teststack (Version 1)

```
void Stack_free(struct Stack *psStack)
```



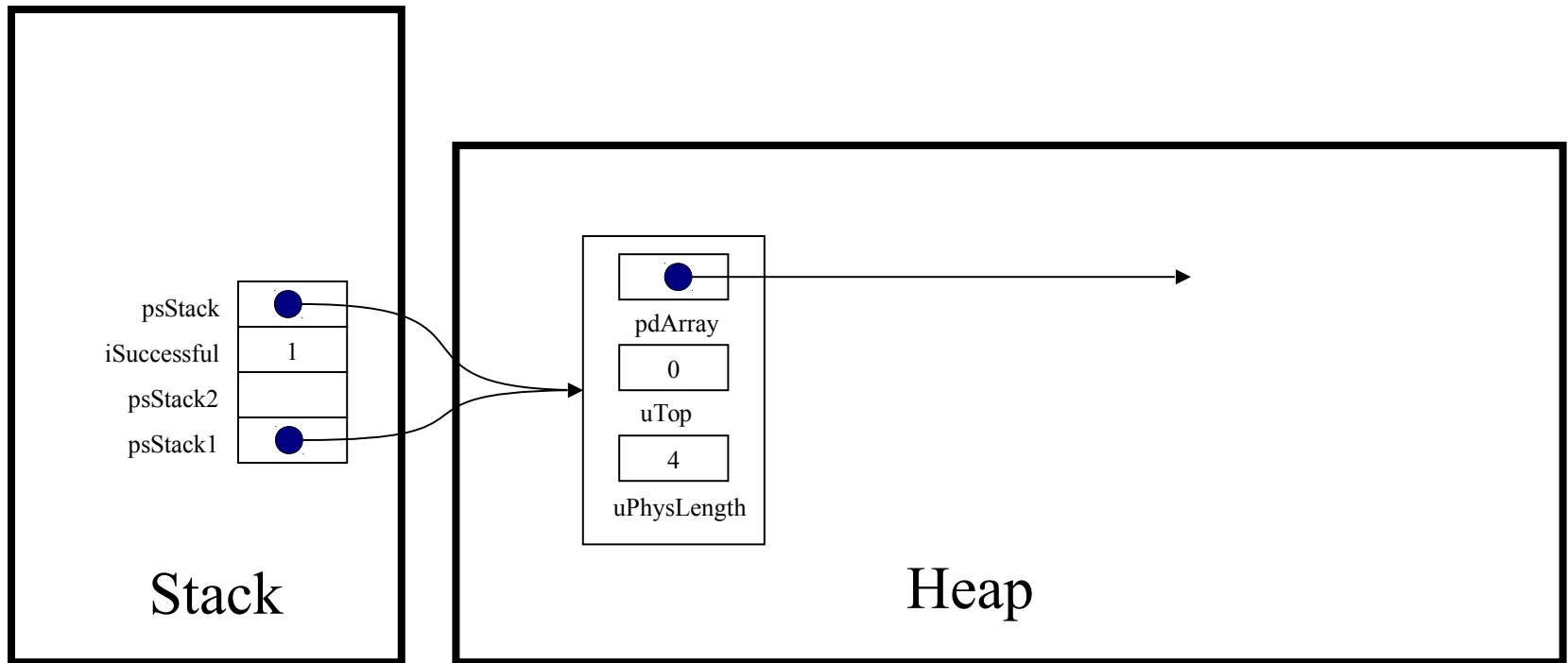
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



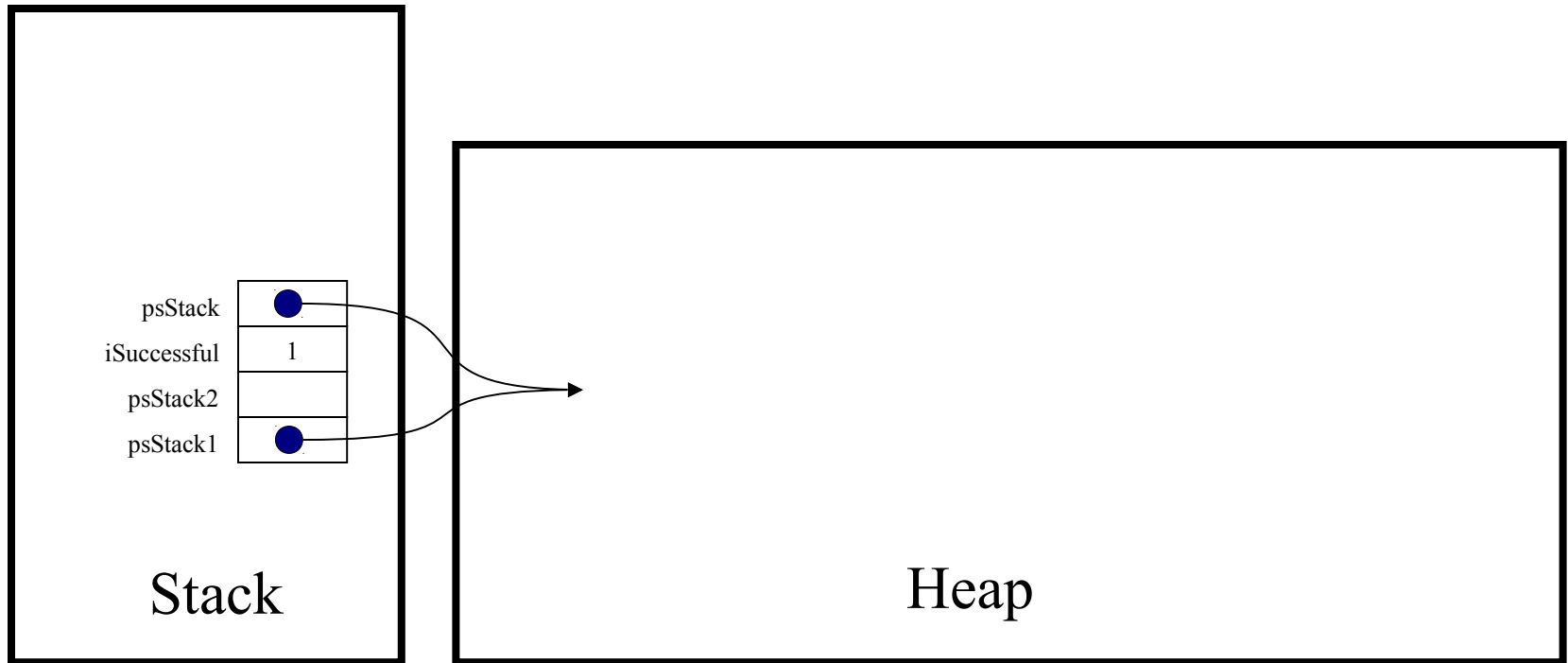
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Trace of teststack (Version 1)

```
free (psStack->pdArray);
```



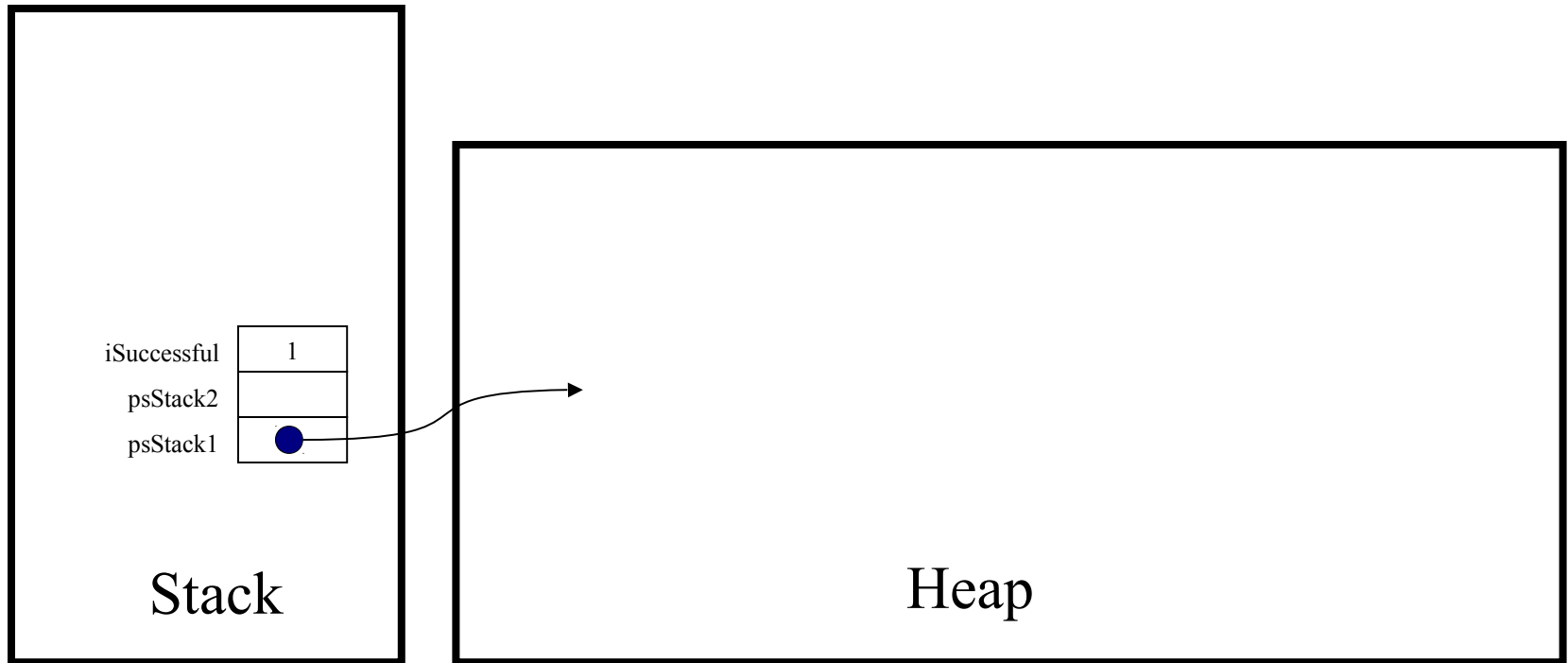
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Trace of teststack (Version 1)

```
free(psStack);
```



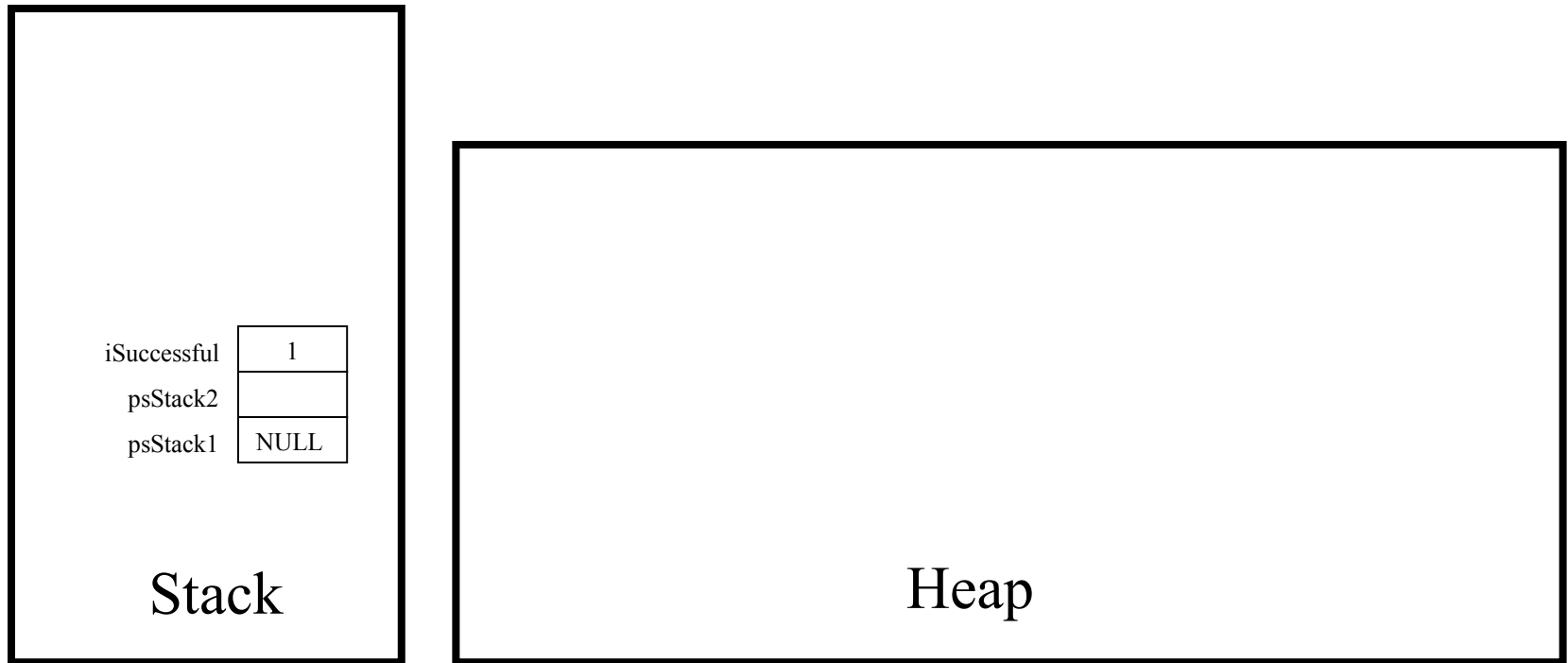
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Implicit return



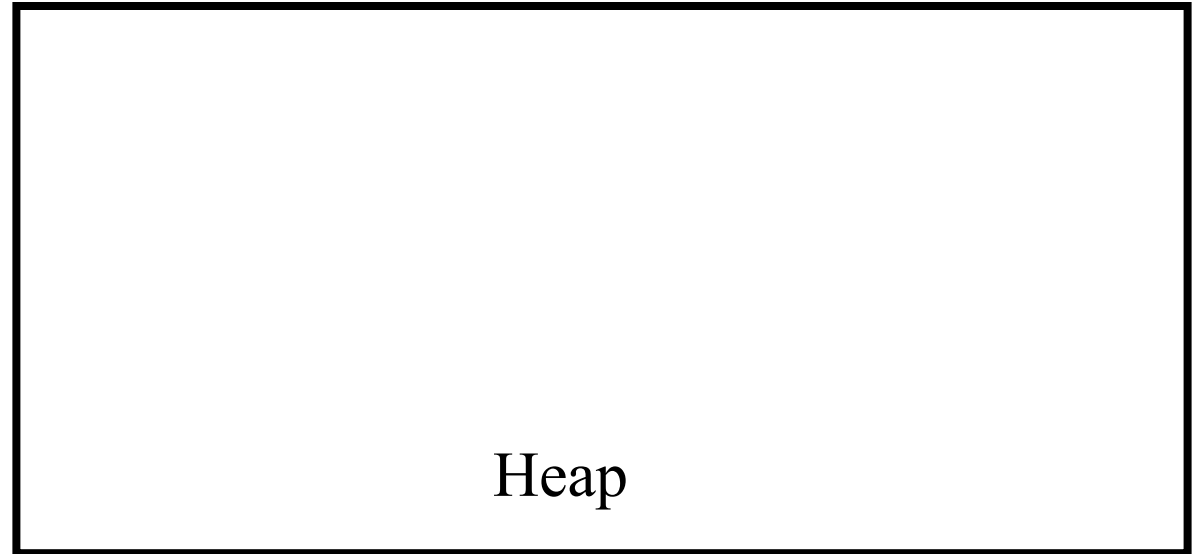
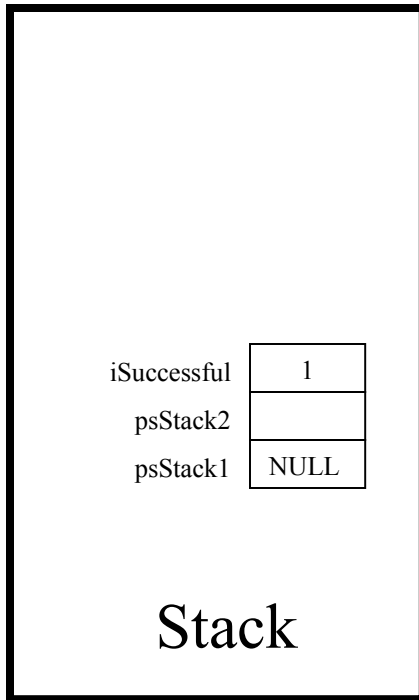
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Trace of teststack (Version 1)

```
psStack1 = NULL;
```



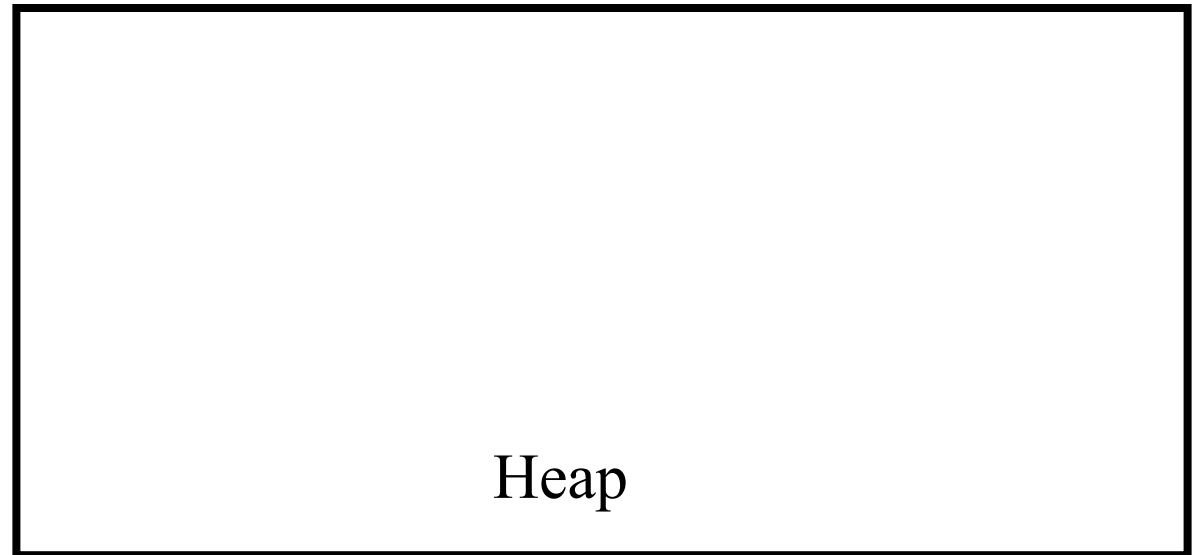
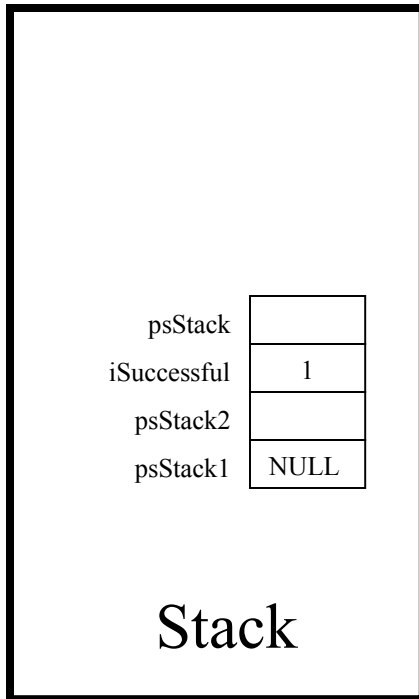
Princeton University
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Trace of teststack (Version 1)

```
psStack2 = Stack_new();
```



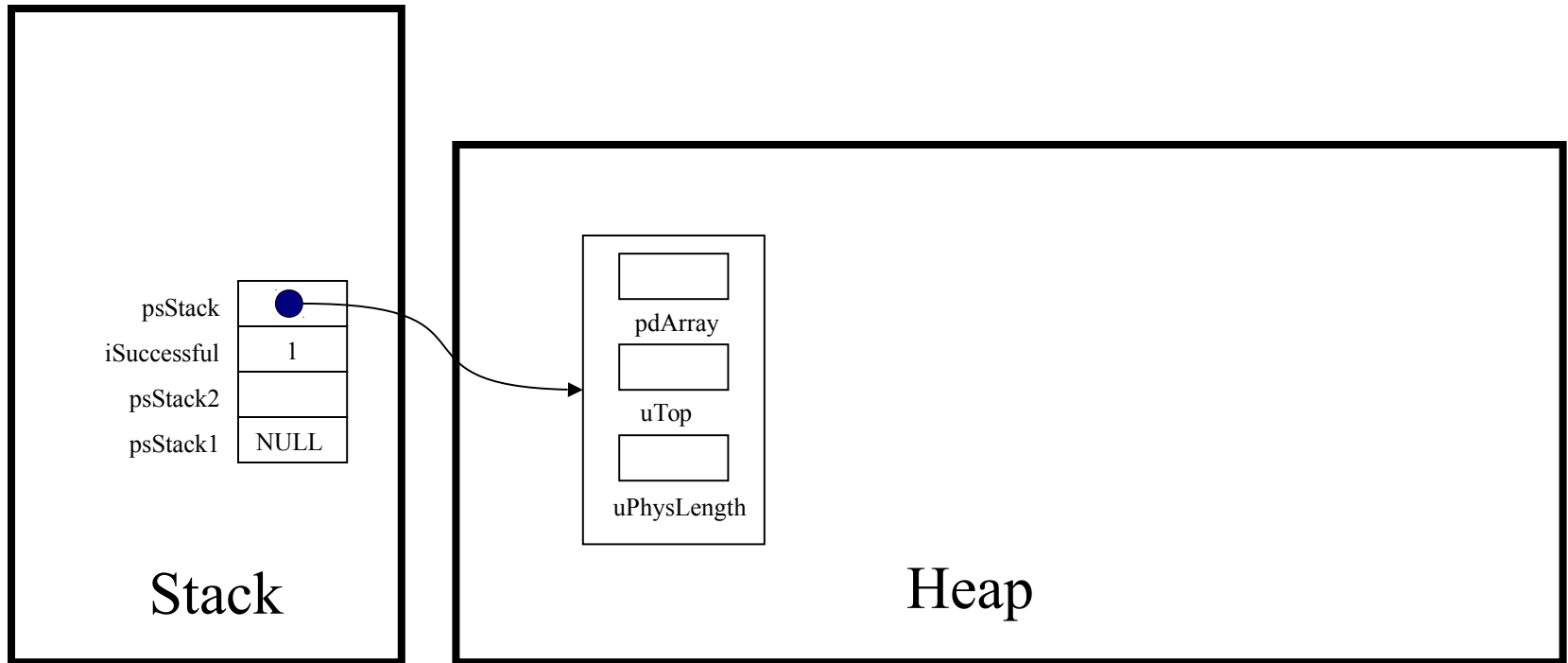
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Trace of teststack (Version 1)

```
struct Stack *psStack;
```



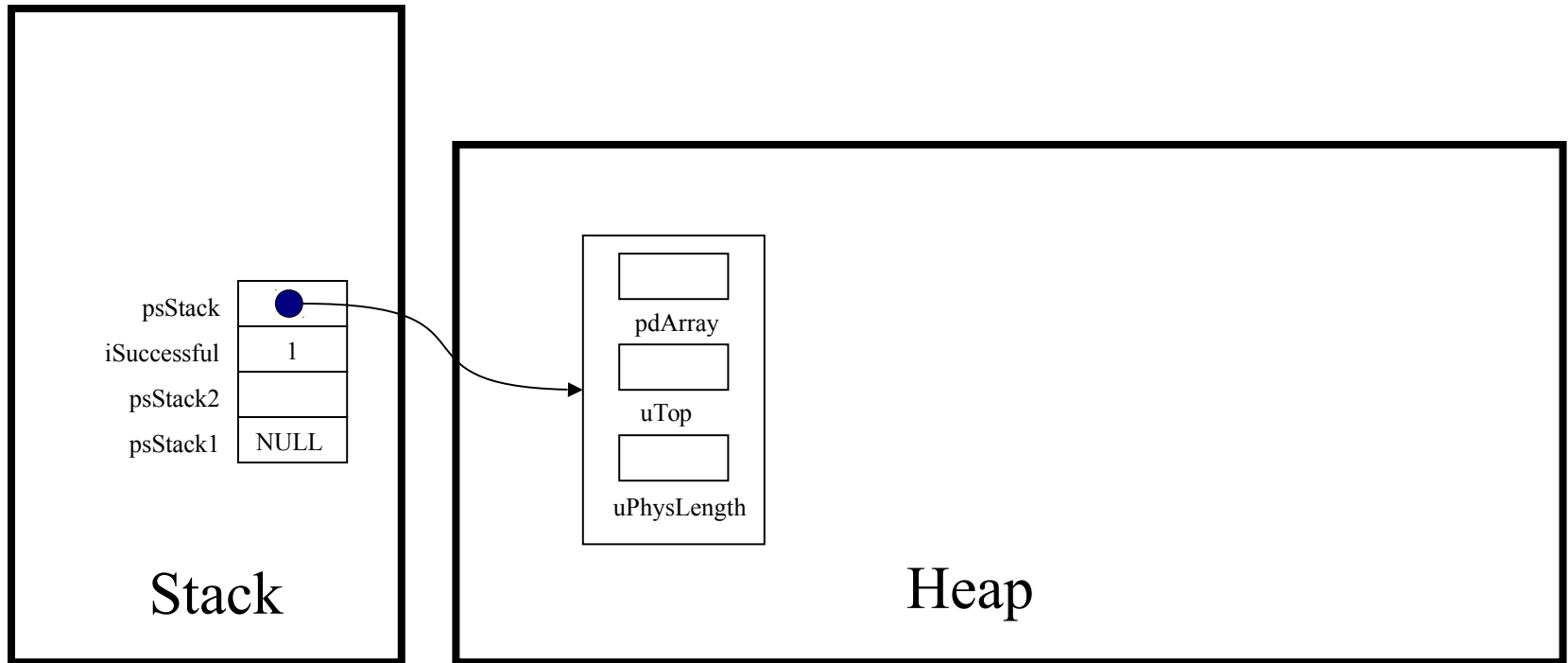
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Trace of teststack (Version 1)

```
psStack = (struct Stack*)malloc(sizeof(struct Stack));
```



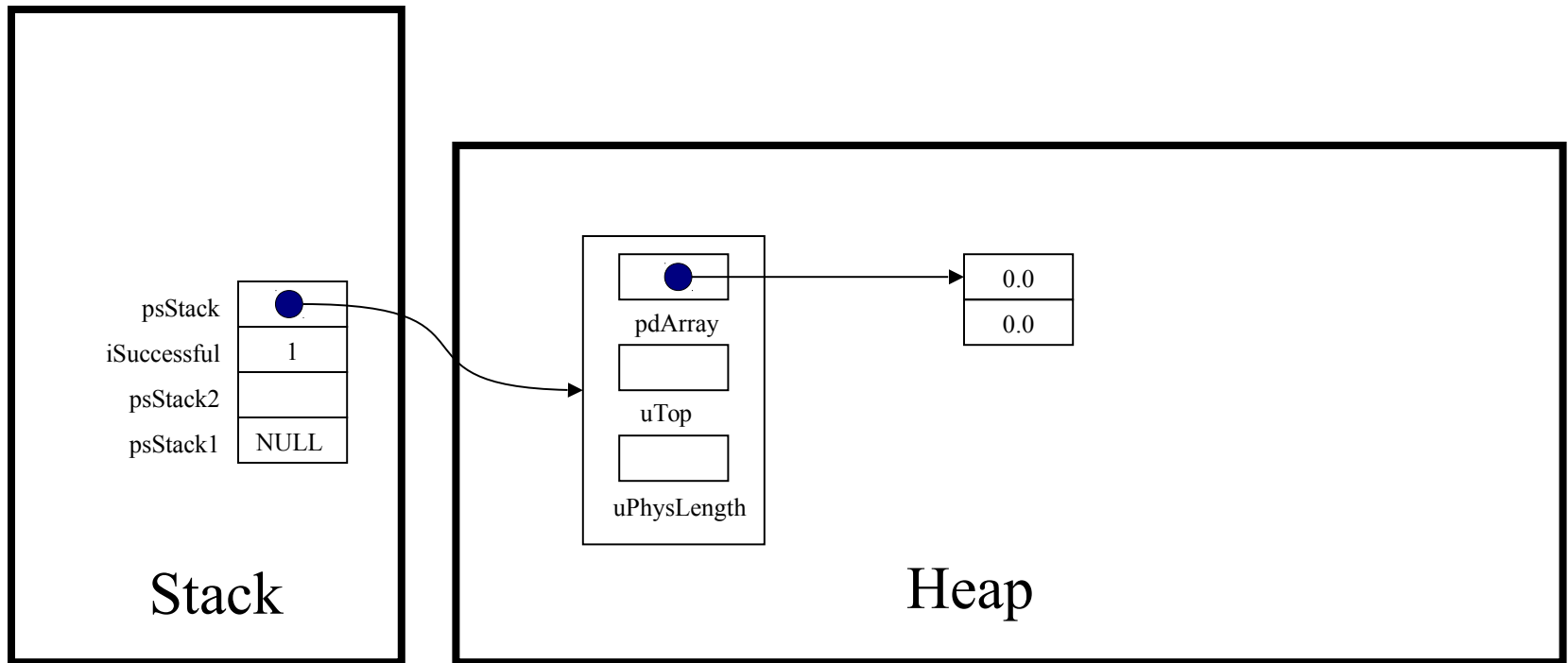
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Trace of teststack (Version 1)

```
if (psStack == NULL)  
    return NULL;
```



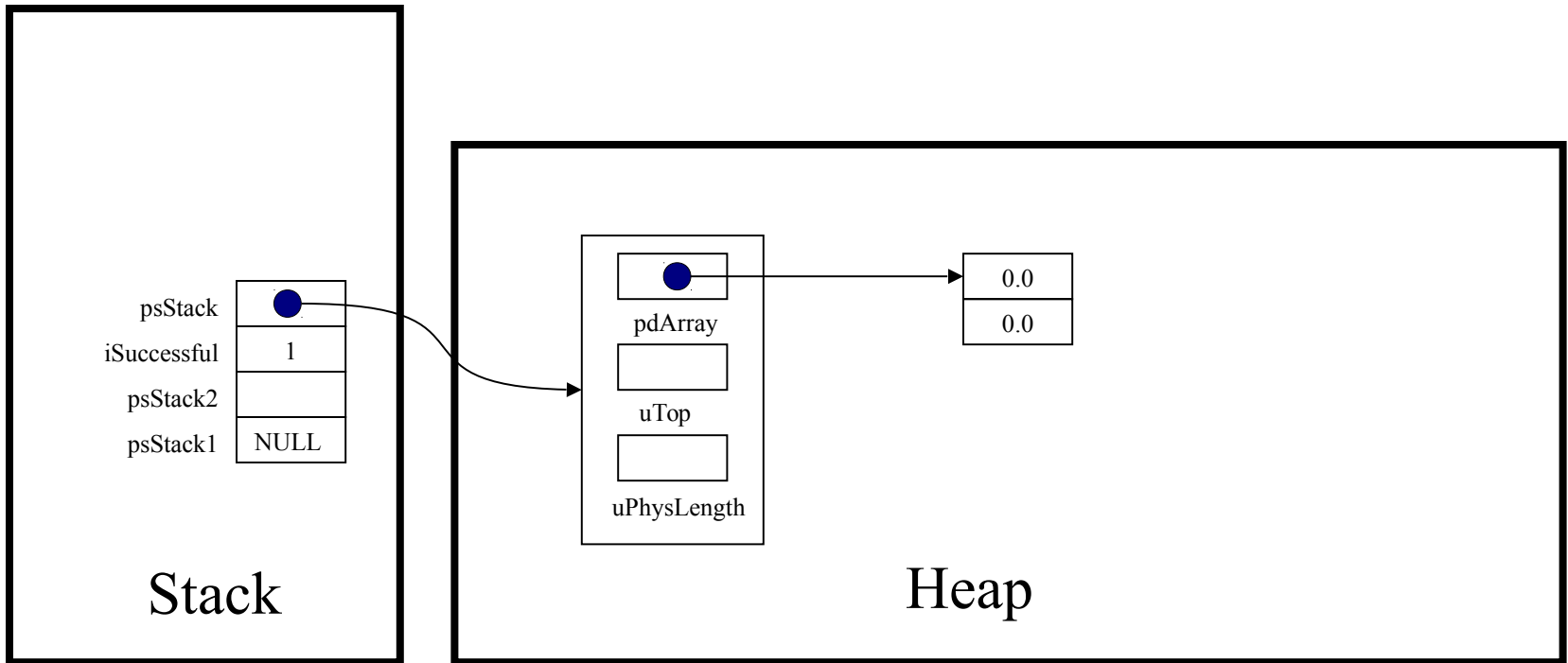
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Trace of teststack (Version 1)

```
psStack->pdArray = (double*)calloc(INITIAL_PHYS_LENGTH, sizeof(double));
```



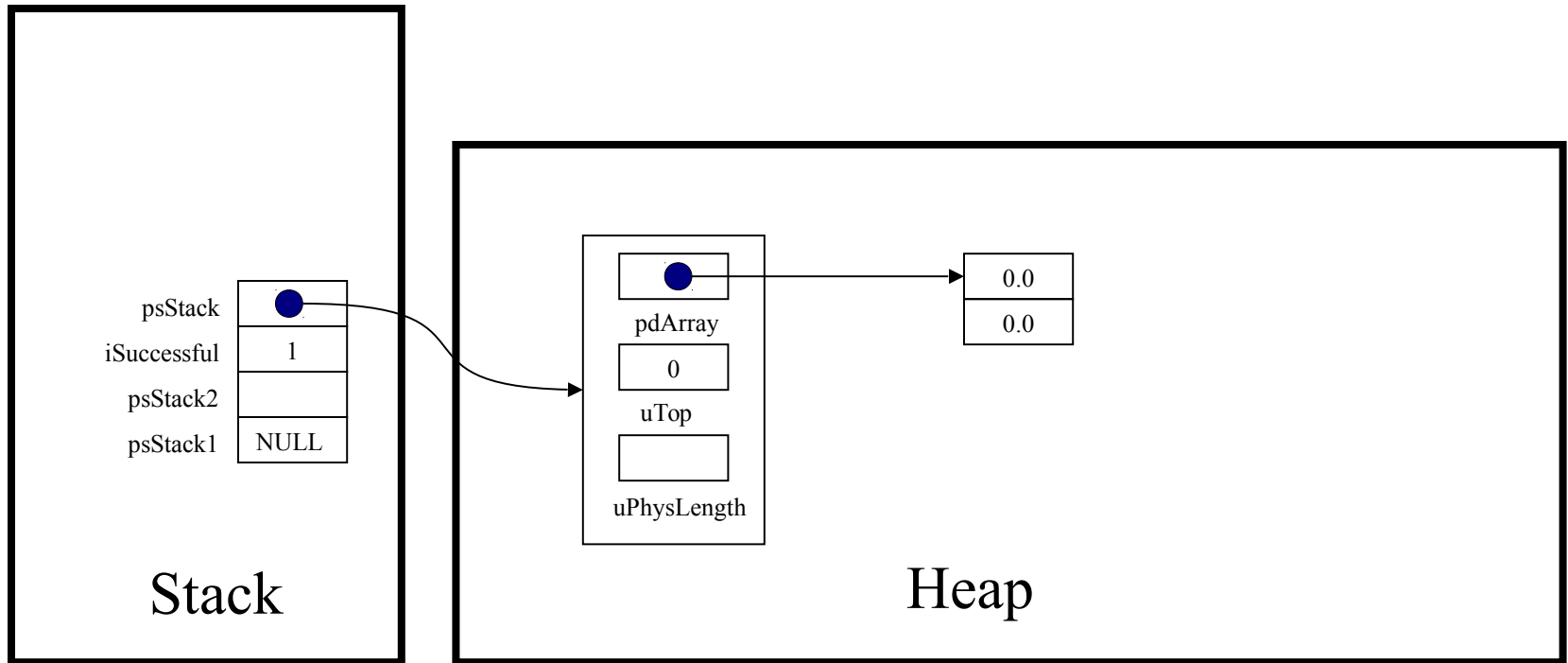
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Trace of teststack (Version 1)

```
if (psStack->pdArray == NULL)
{
    free(psStack);
    return NULL;
}
```



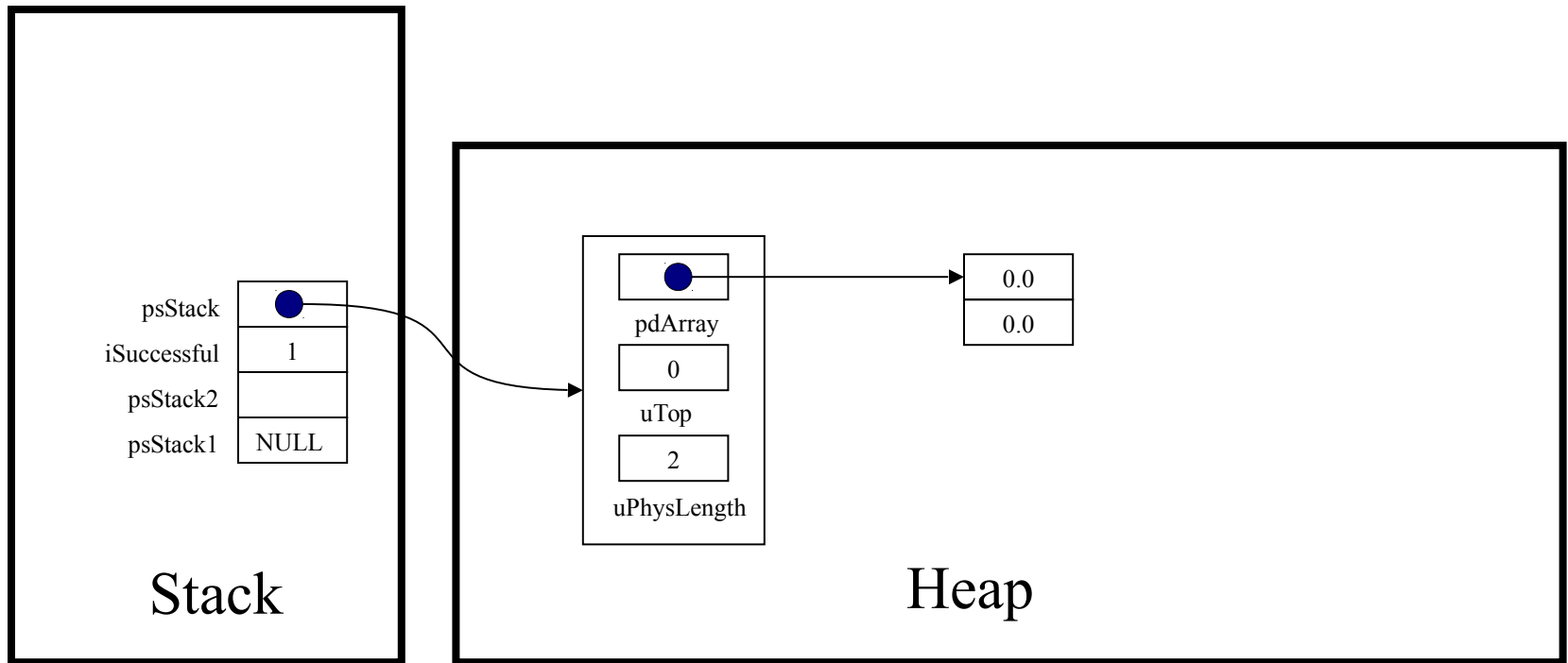
Princeton University
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Trace of teststack (Version 1)

```
psStack->uTop = 0;
```



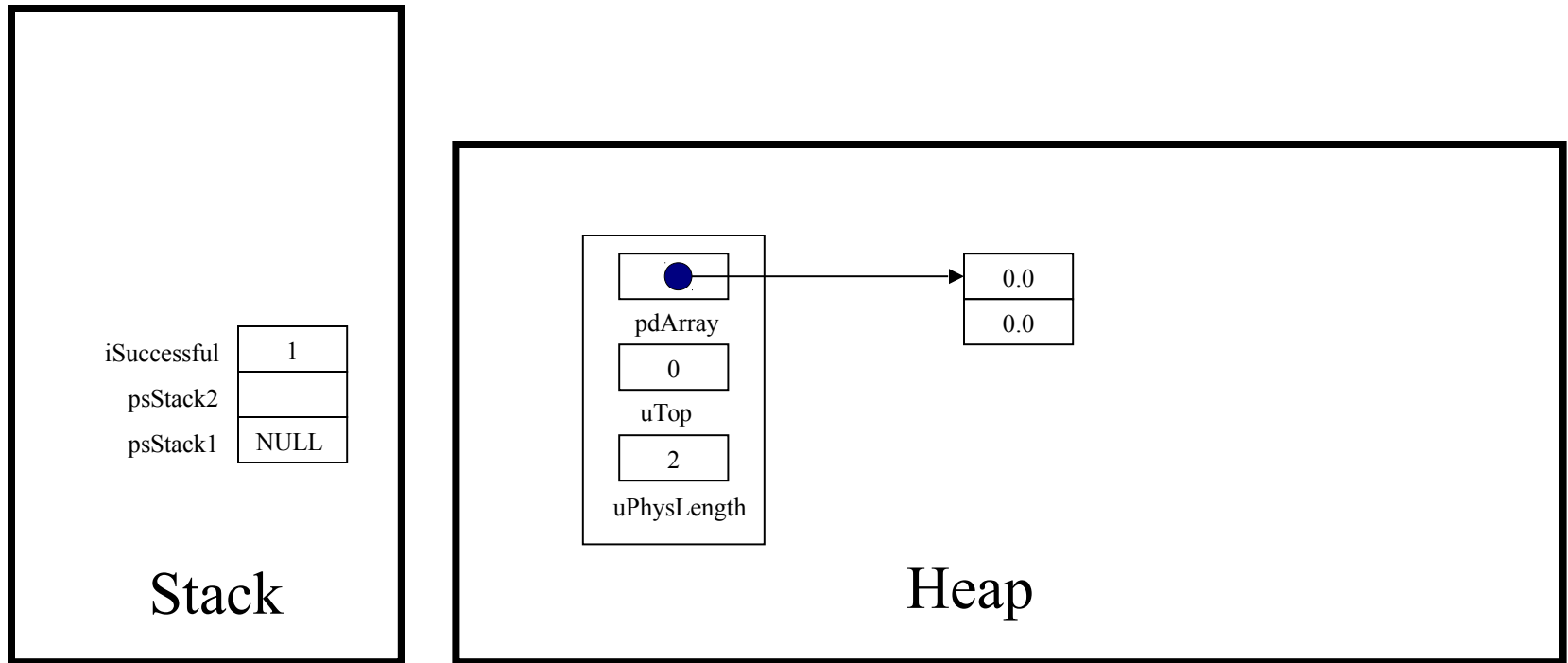
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Trace of teststack (Version 1)

```
psStack->uPhysLength = INITIAL_PHYS_LENGTH;
```



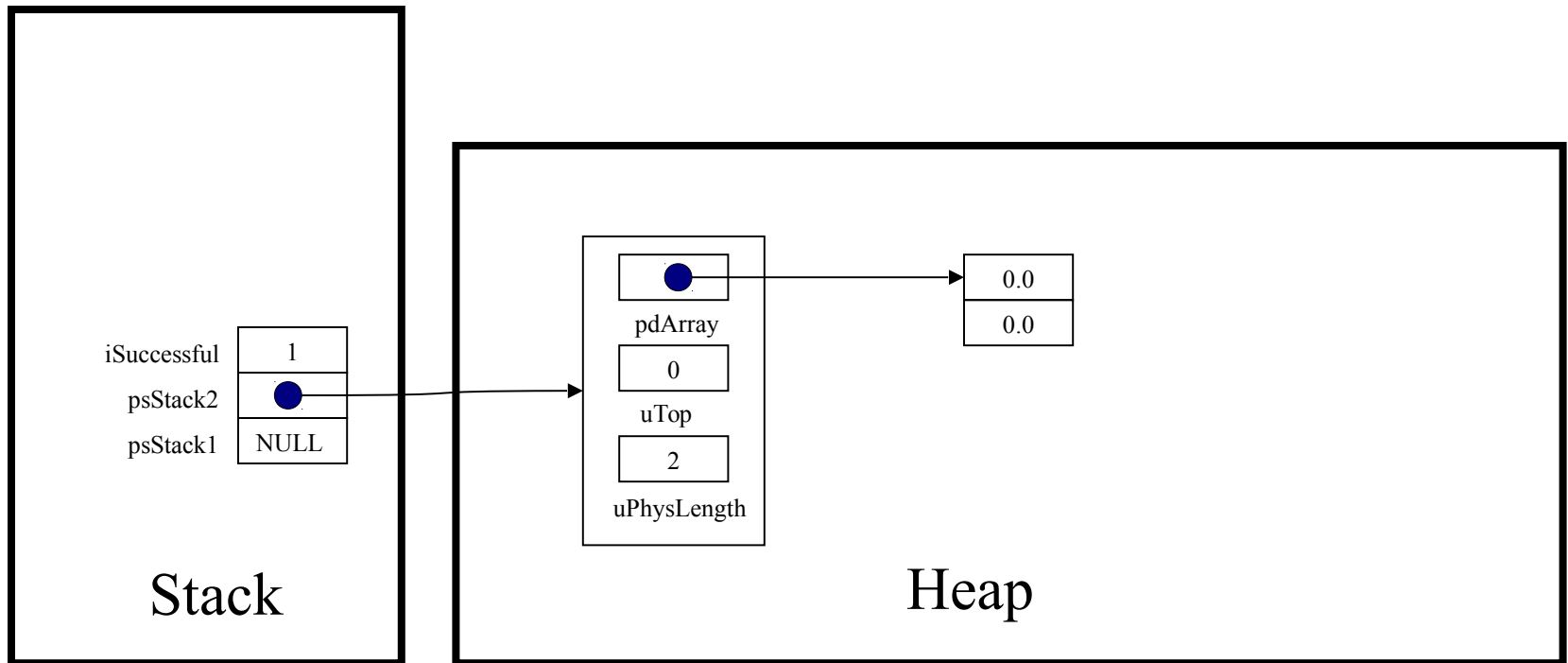
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Trace of teststack (Version 1)

```
return psStack;
```



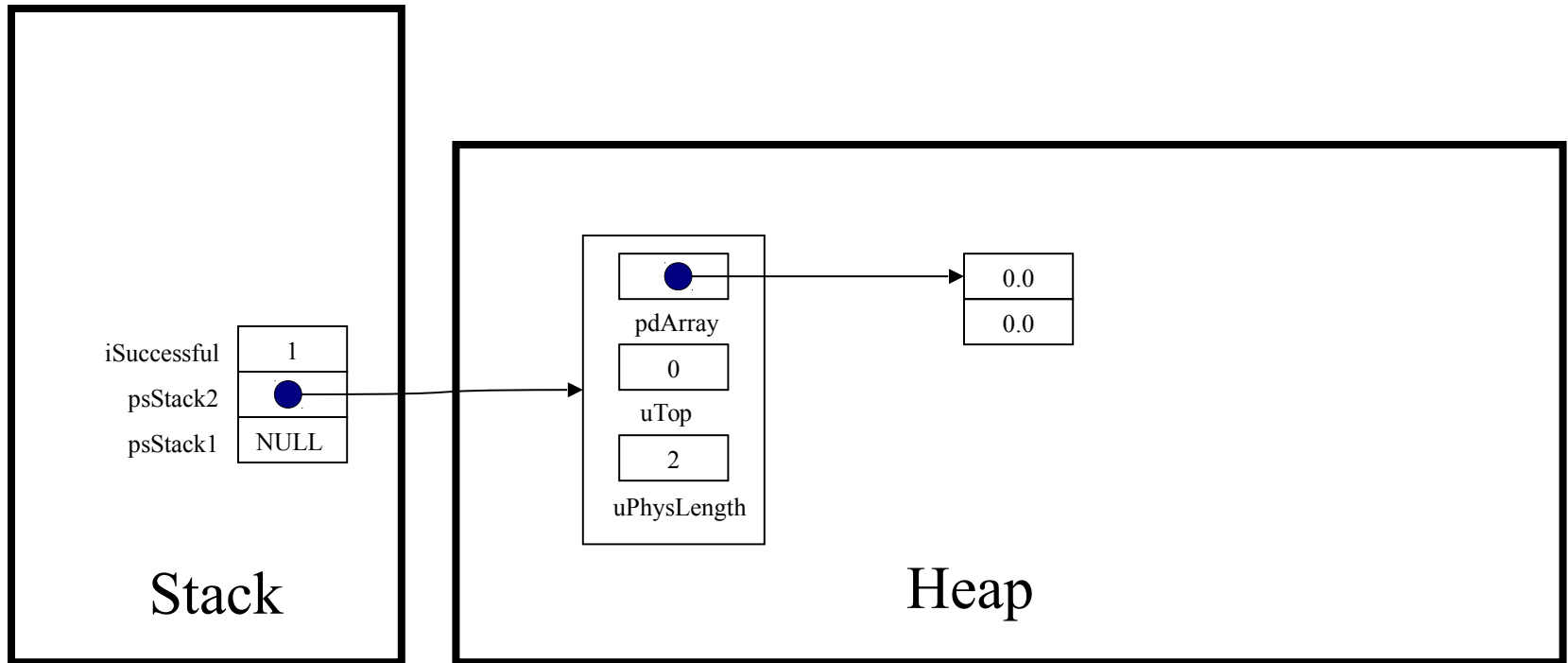
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Trace of teststack (Version 1)

```
psStack2 = Stack_new();
```



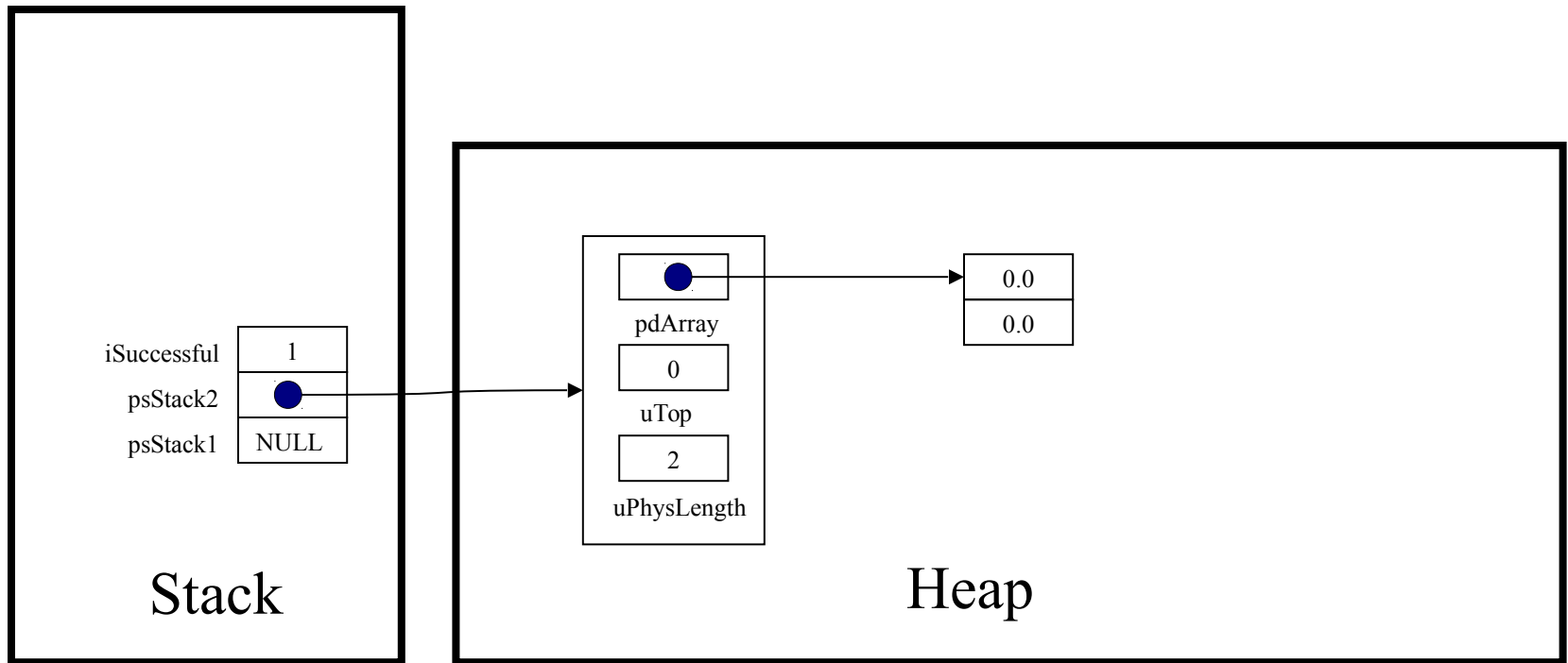
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Trace of teststack (Version 1)

```
if (psStack2 == NULL) handleMemoryError();
```



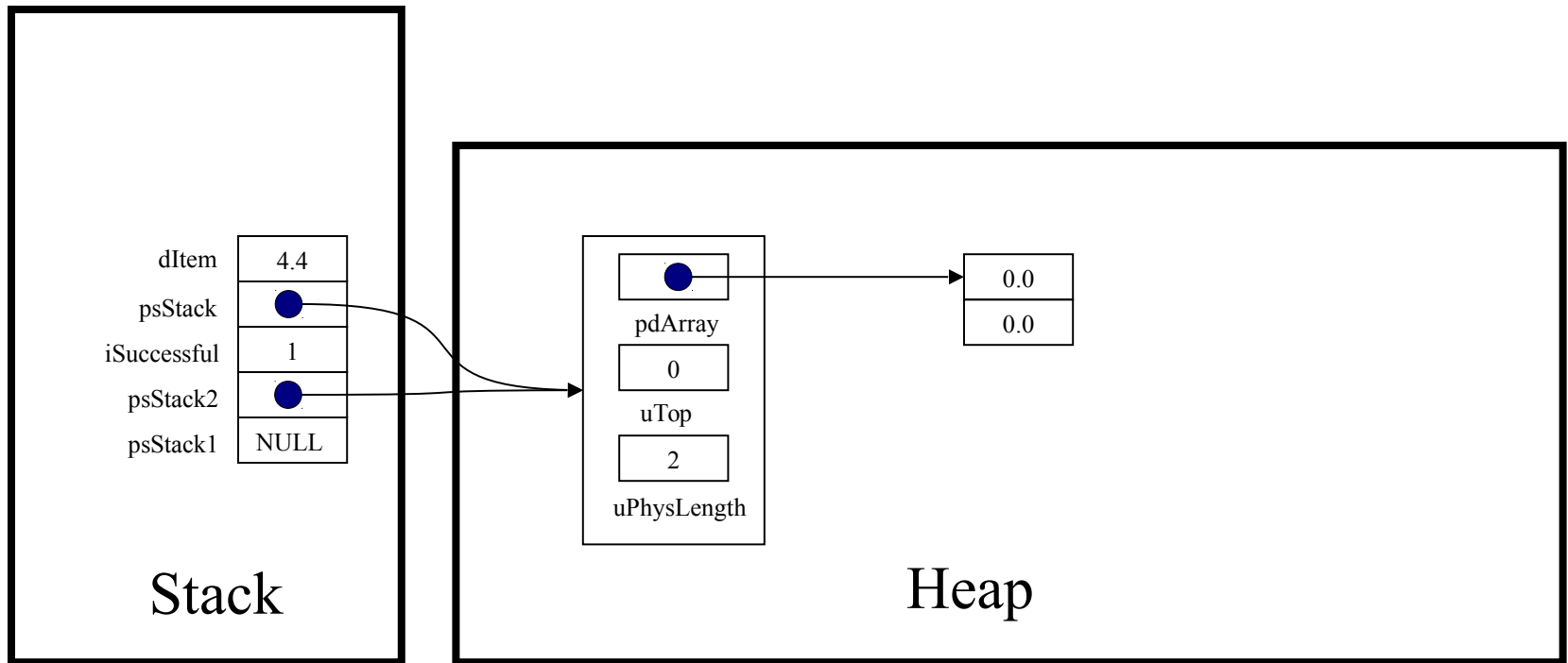
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Trace of teststack (Version 1)

```
iSuccessful = Stack_push(psStack2, 4.4);
```



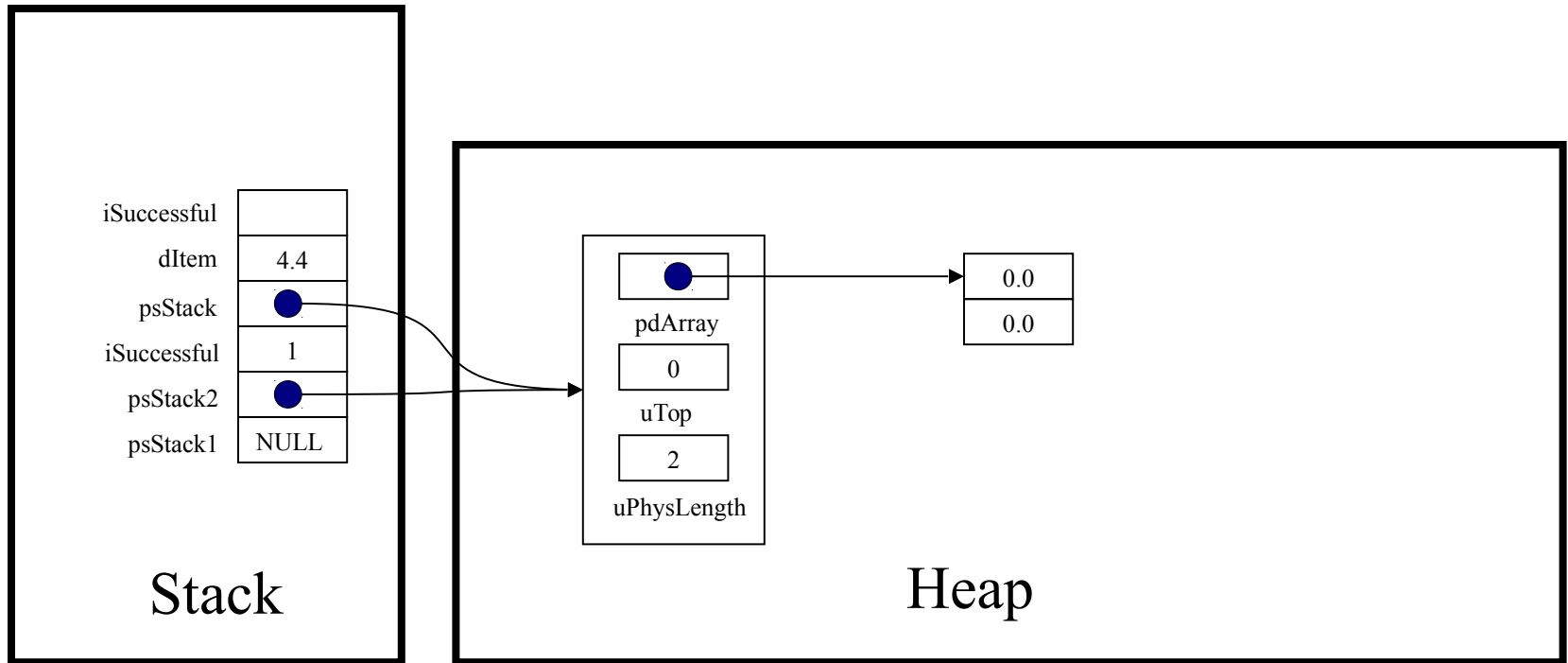
Princeton University
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Trace of teststack (Version 1)

```
int Stack_push(struct Stack *psStack, double dItem)
```



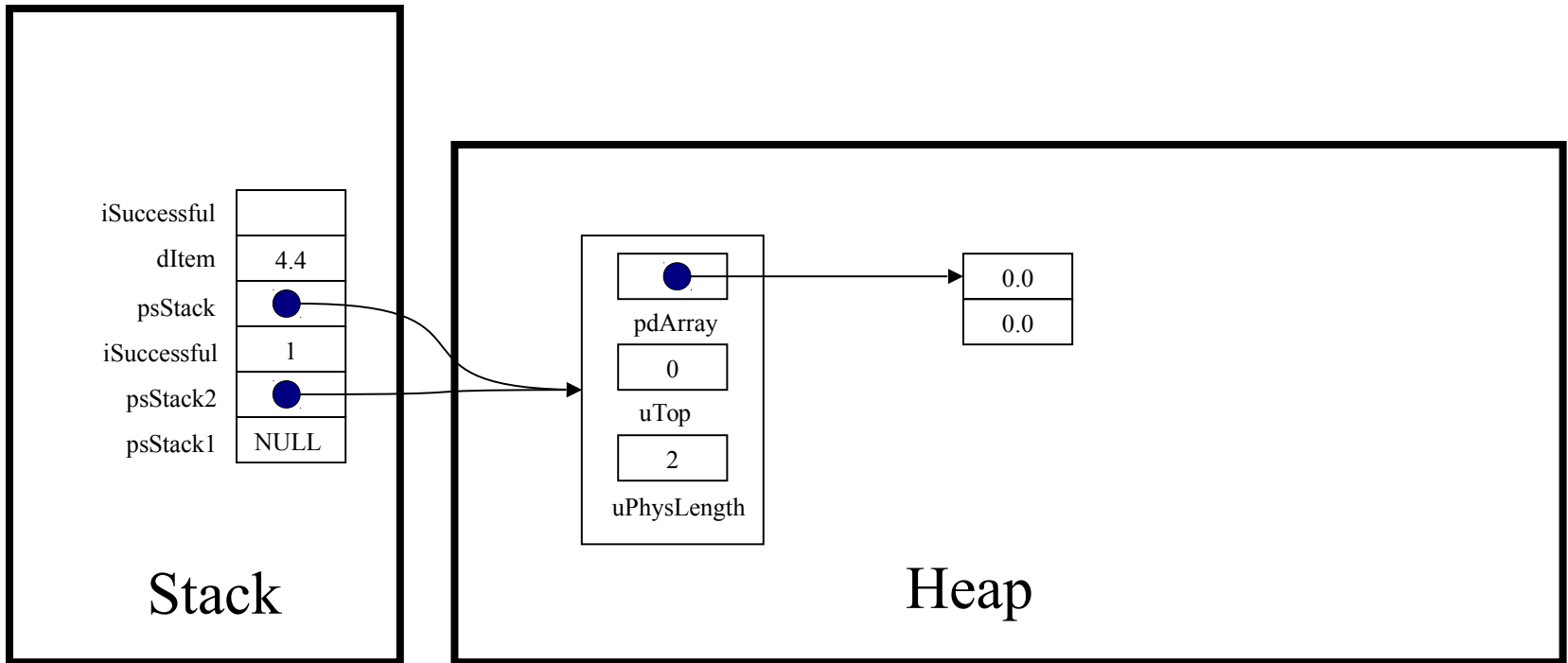
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```
int iSuccessful;
```



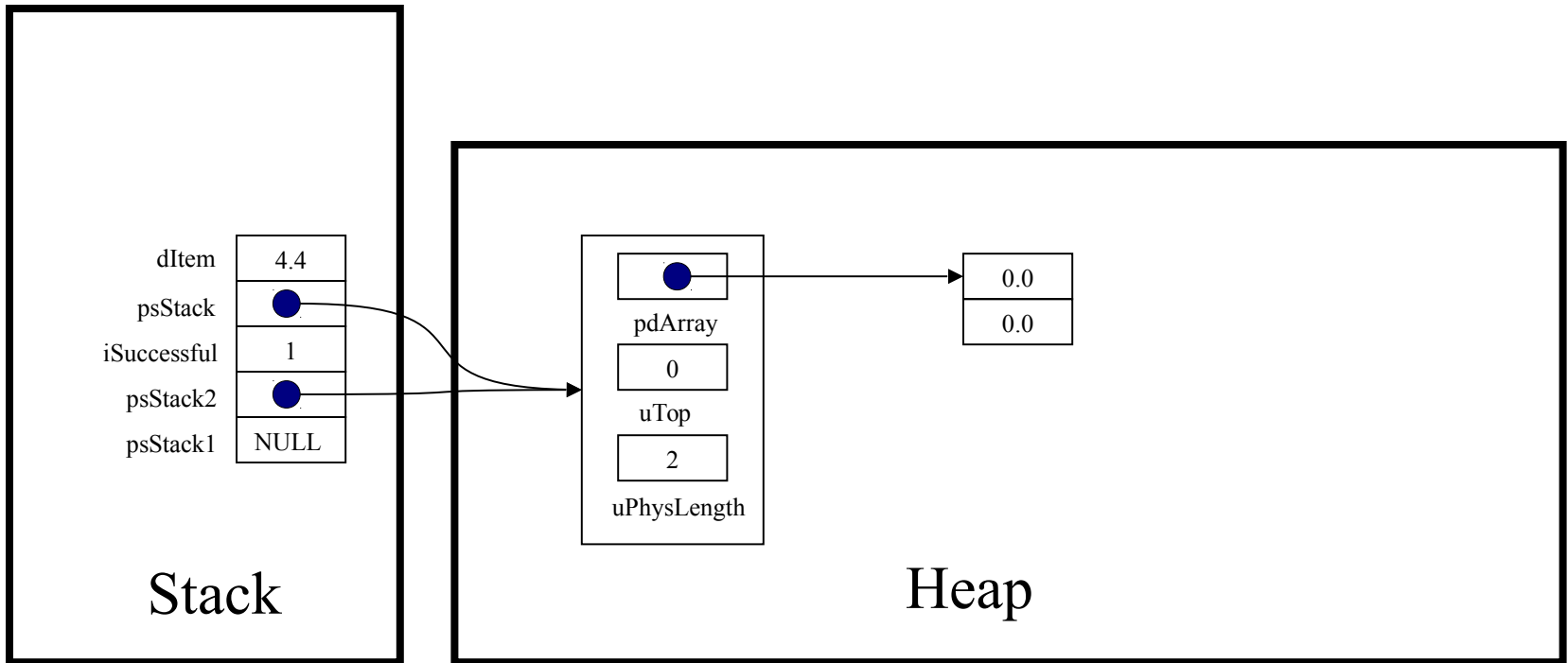
Princeton University
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



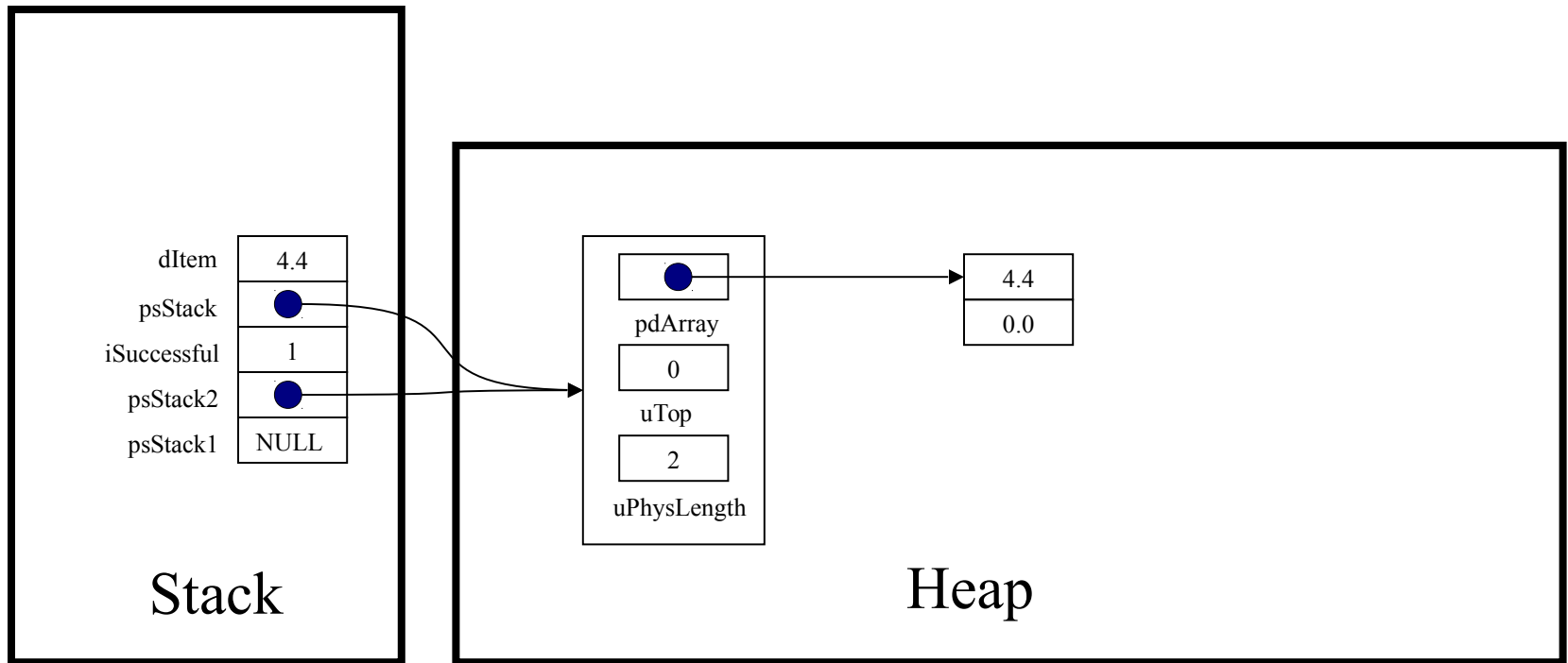
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Trace of teststack (Version 1)

```
if (psStack->uTop == psStack->uPhysLength)  
...
```



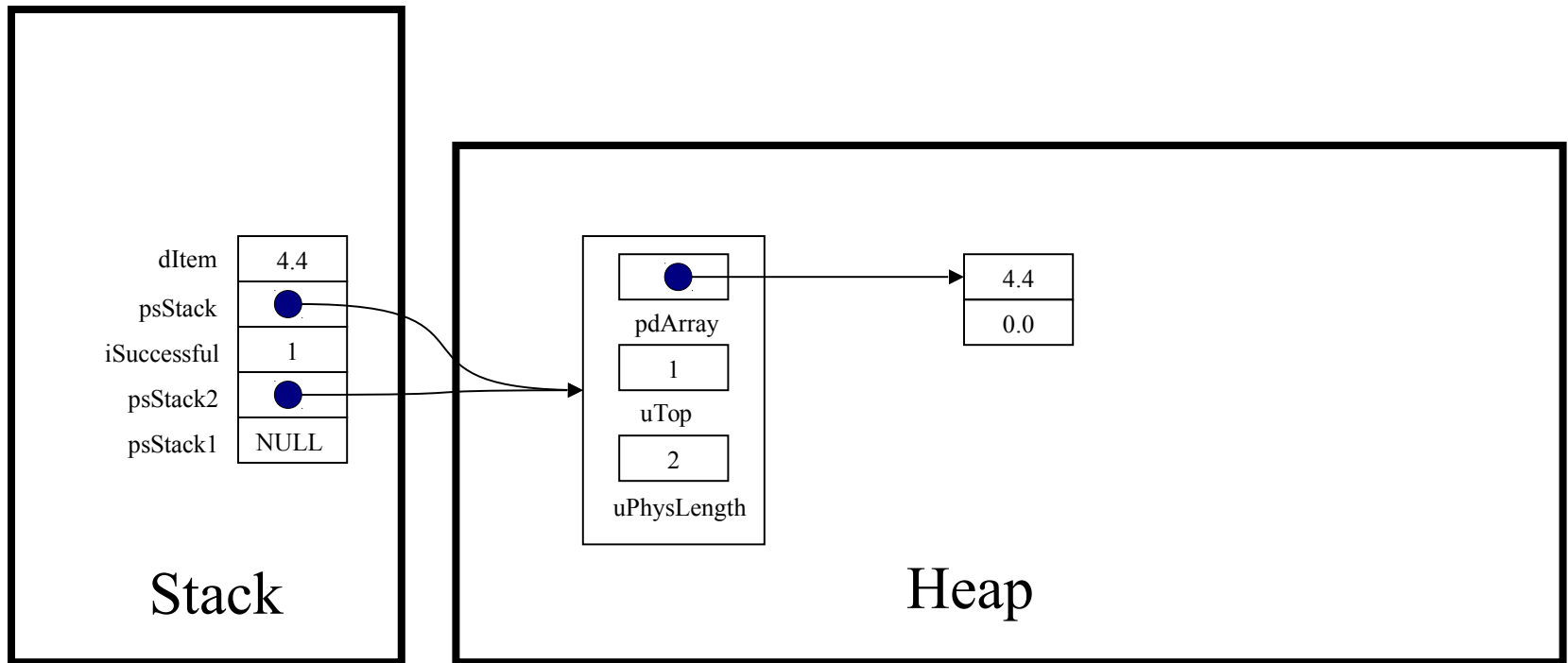
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Trace of teststack (Version 1)

```
(psStack->pdArray)[psStack->uTop] = dItem;
```



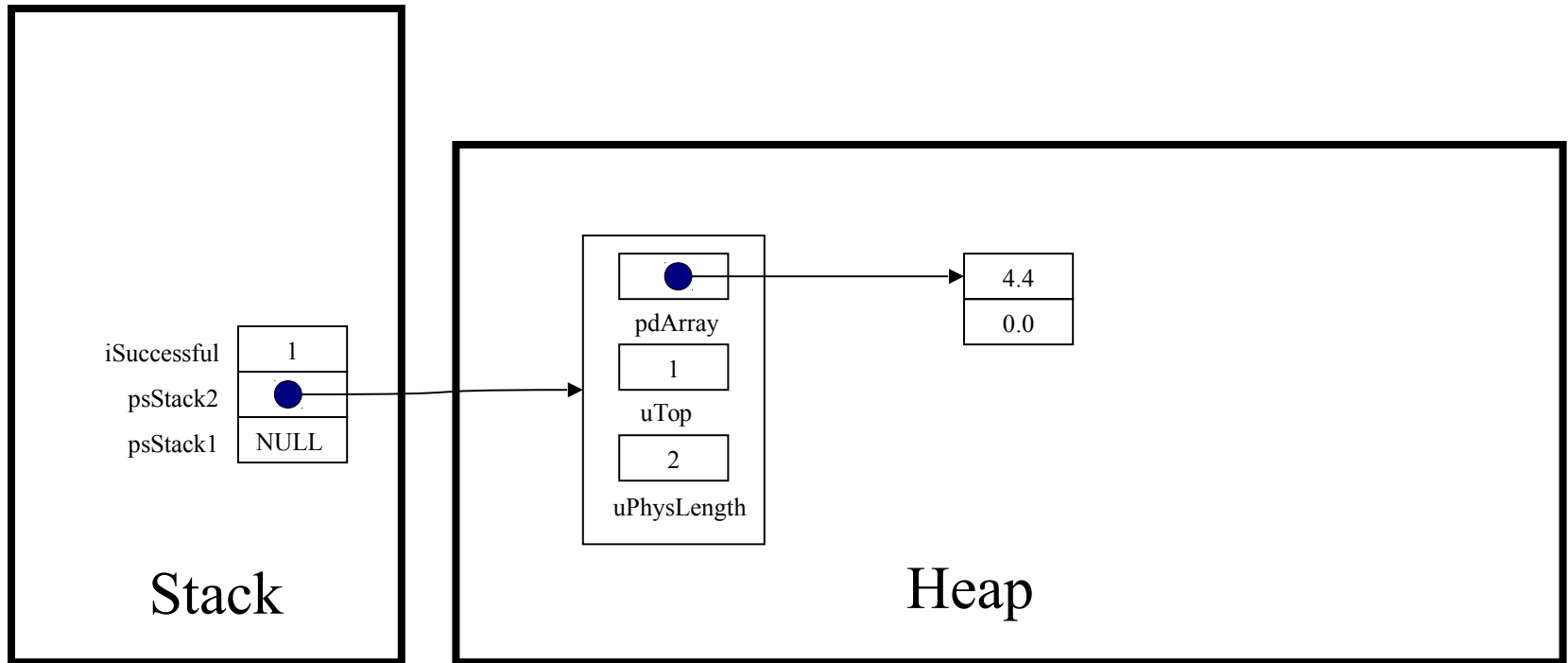
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Trace of teststack (Version 1)

```
(psStack->uTop) ++;
```



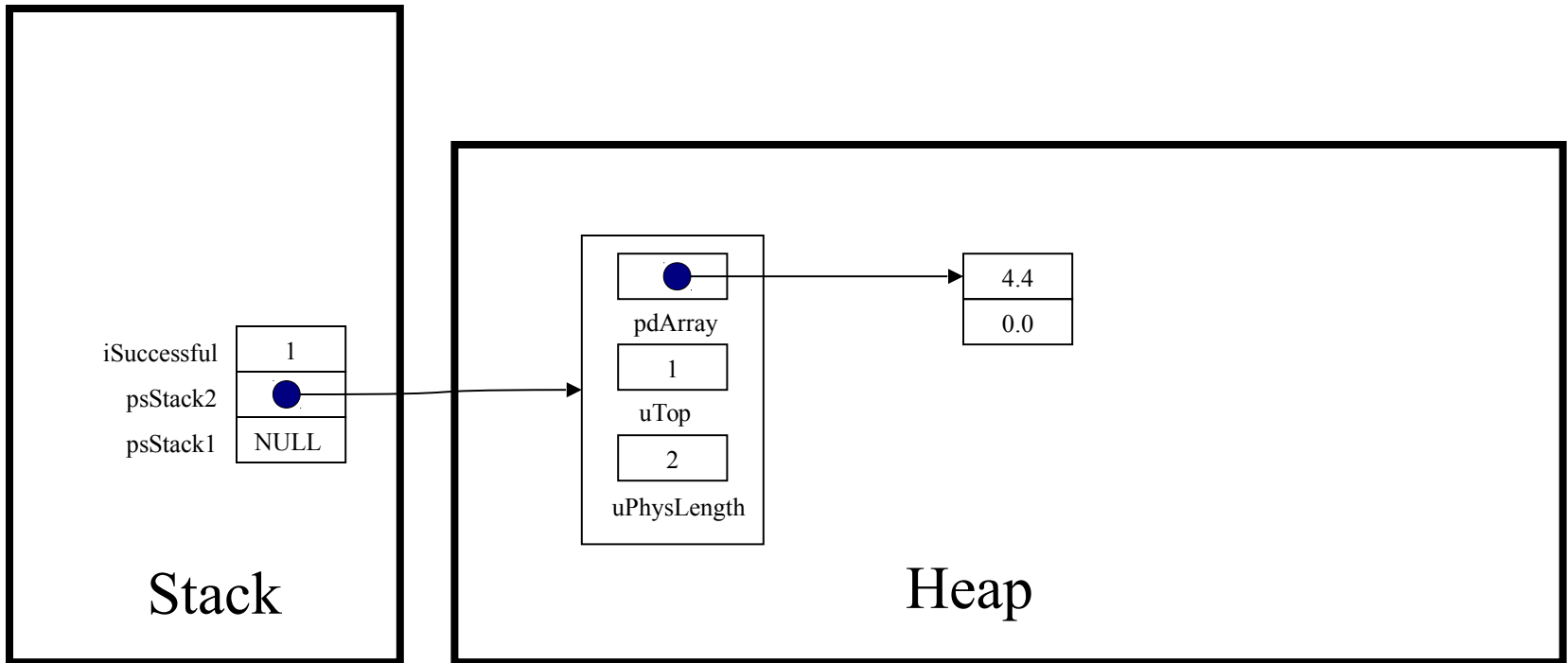
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Trace of teststack (Version 1)

```
return 1;
```



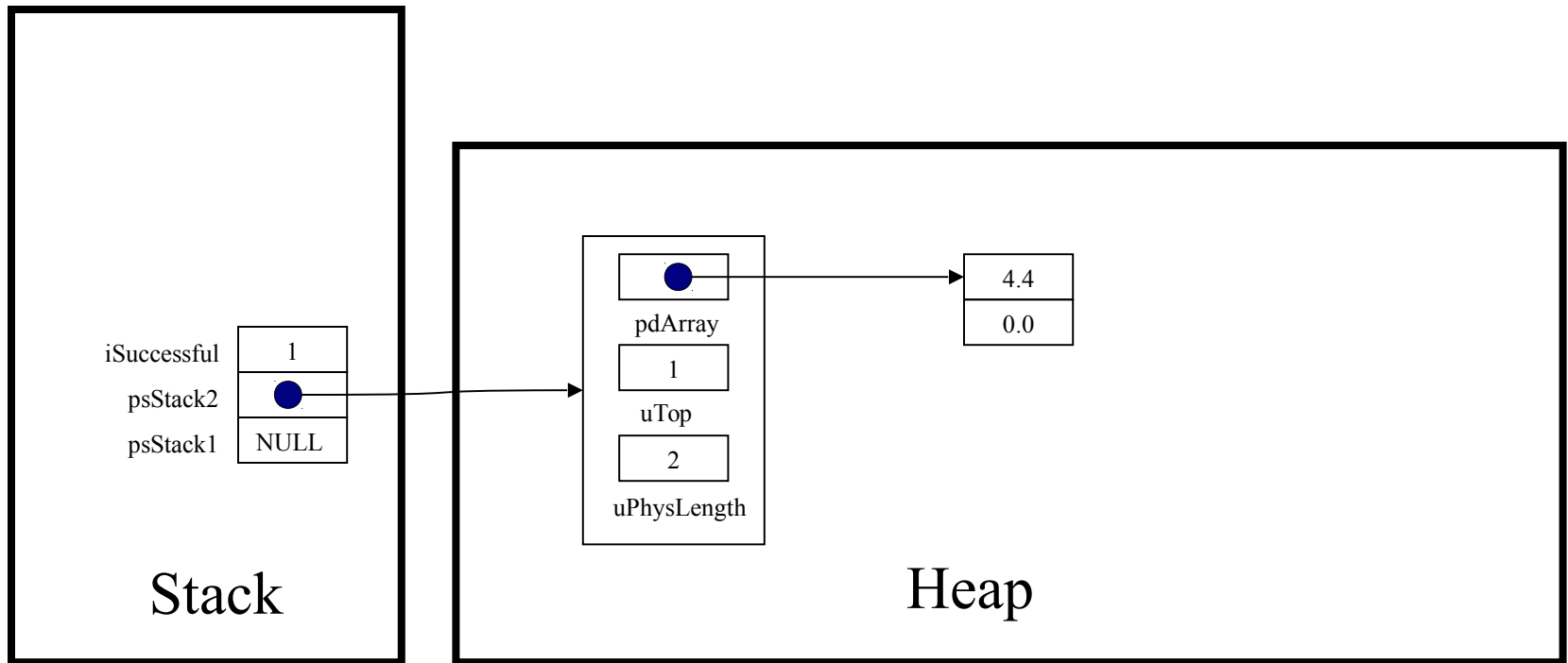
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Trace of teststack (Version 1)

```
iSuccessful = Stack_push(psStack2, 4.4);
```



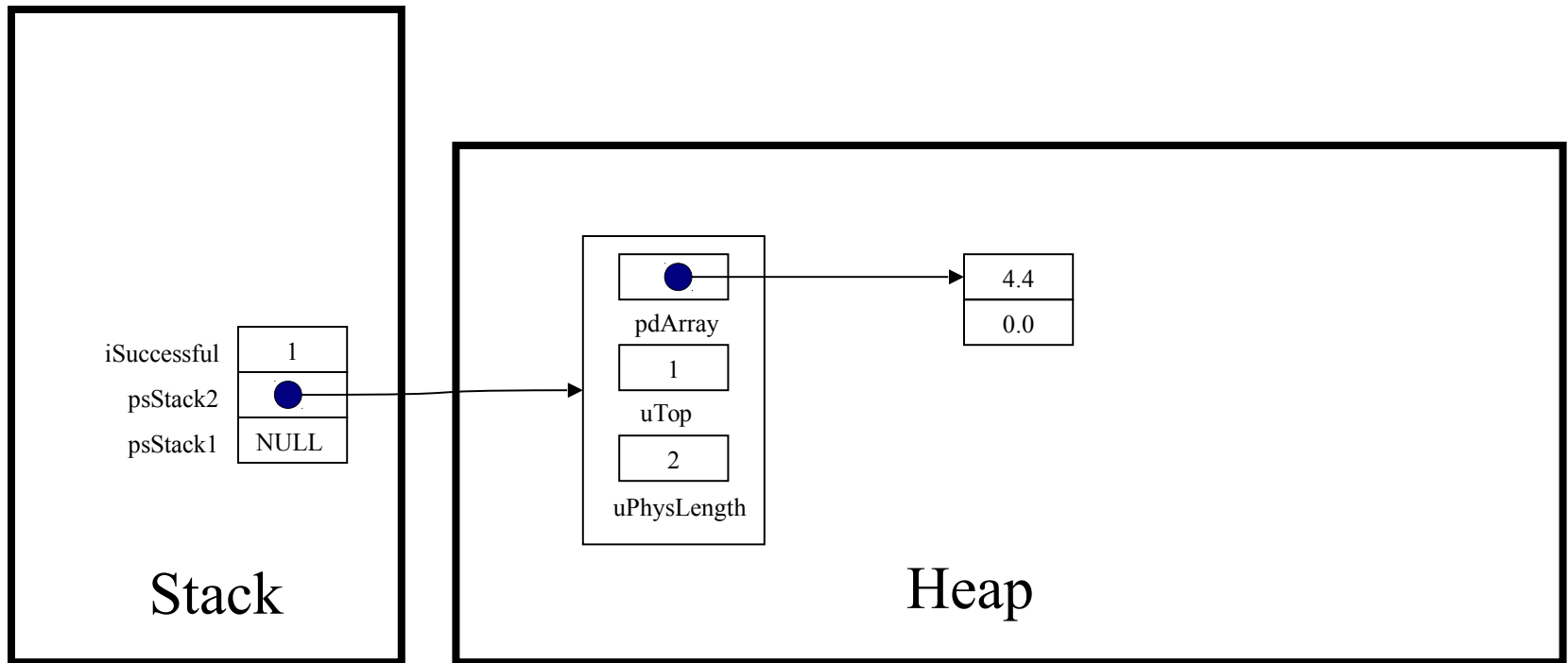
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Trace of teststack (Version 1)

```
if (! iSuccessful) handleMemoryError();
```



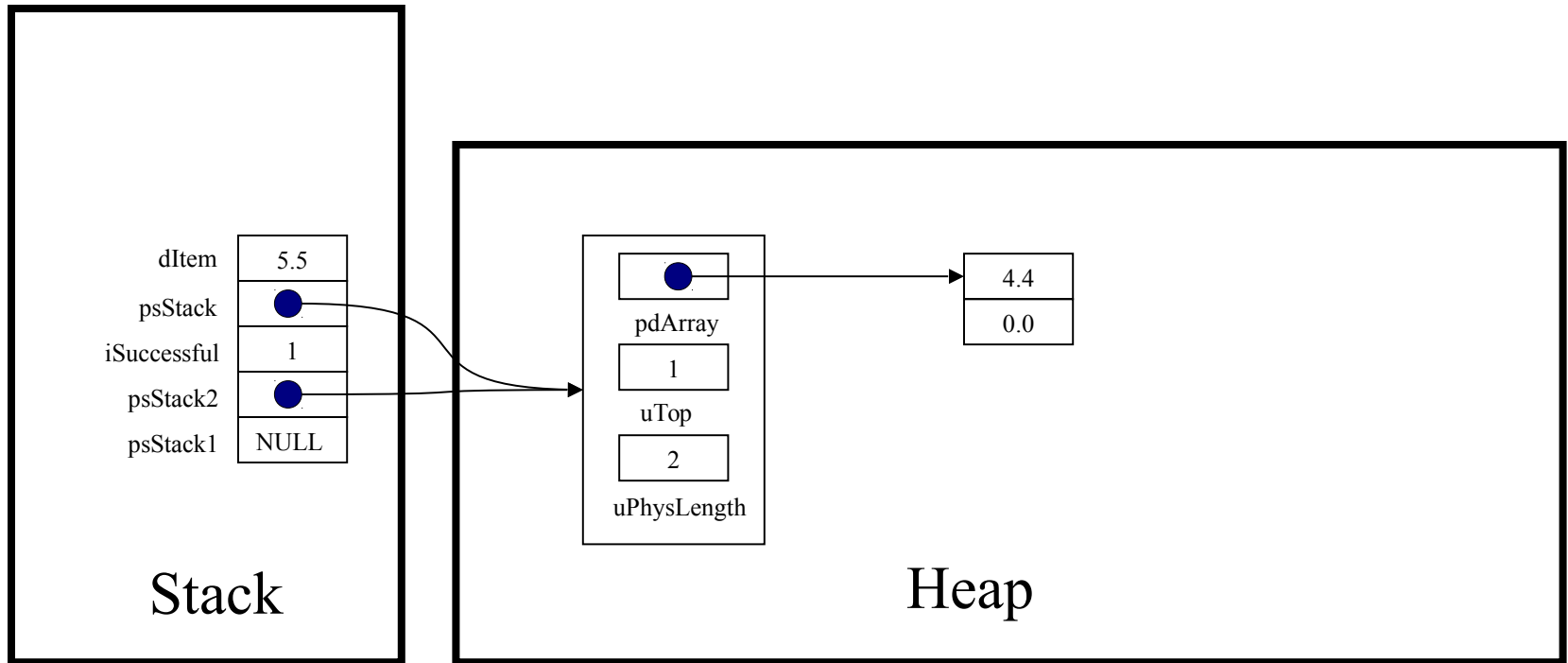
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Trace of teststack (Version 1)

```
iSuccessful = Stack_push(psStack2, 5.5);
```



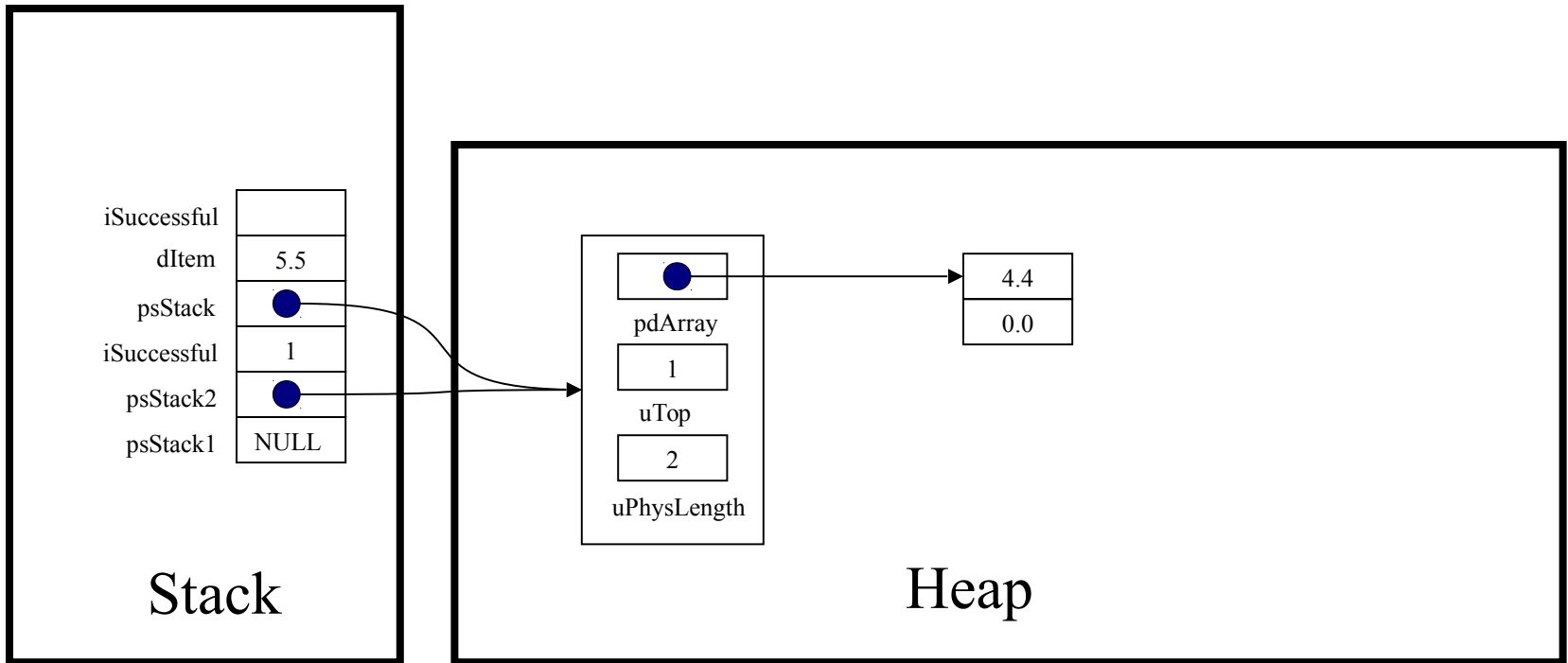
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Trace of teststack (Version 1)

```
int Stack_push(struct Stack *psStack, double dItem)
```



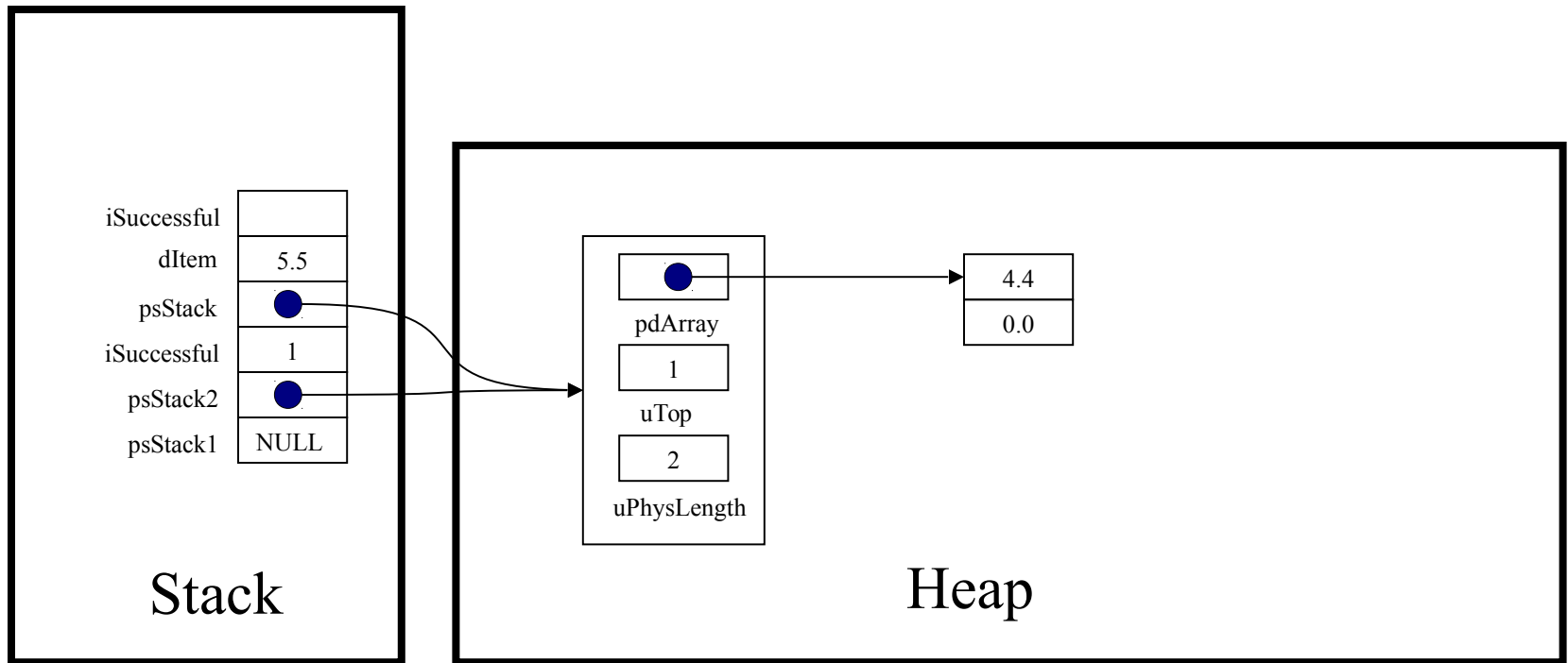
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```
int iSuccessful;
```



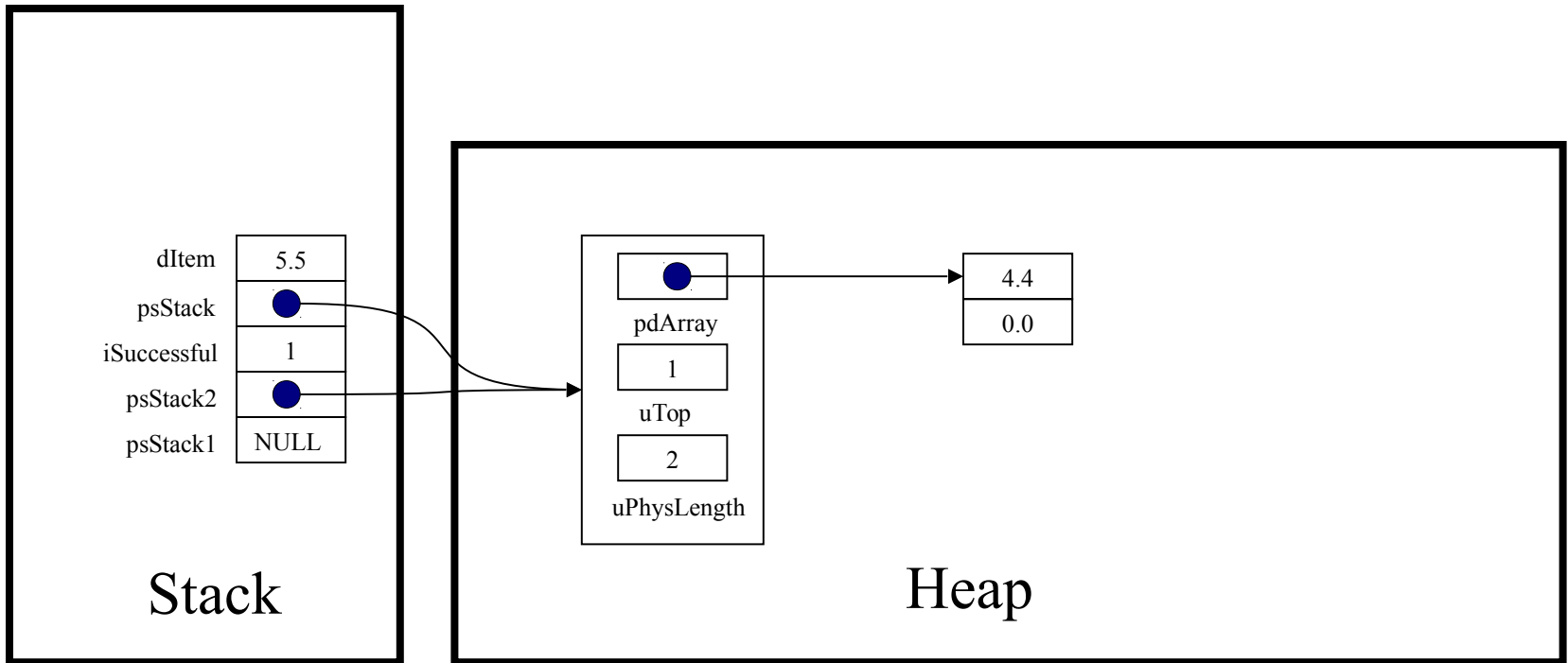
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```
assert (psStack != NULL);
```



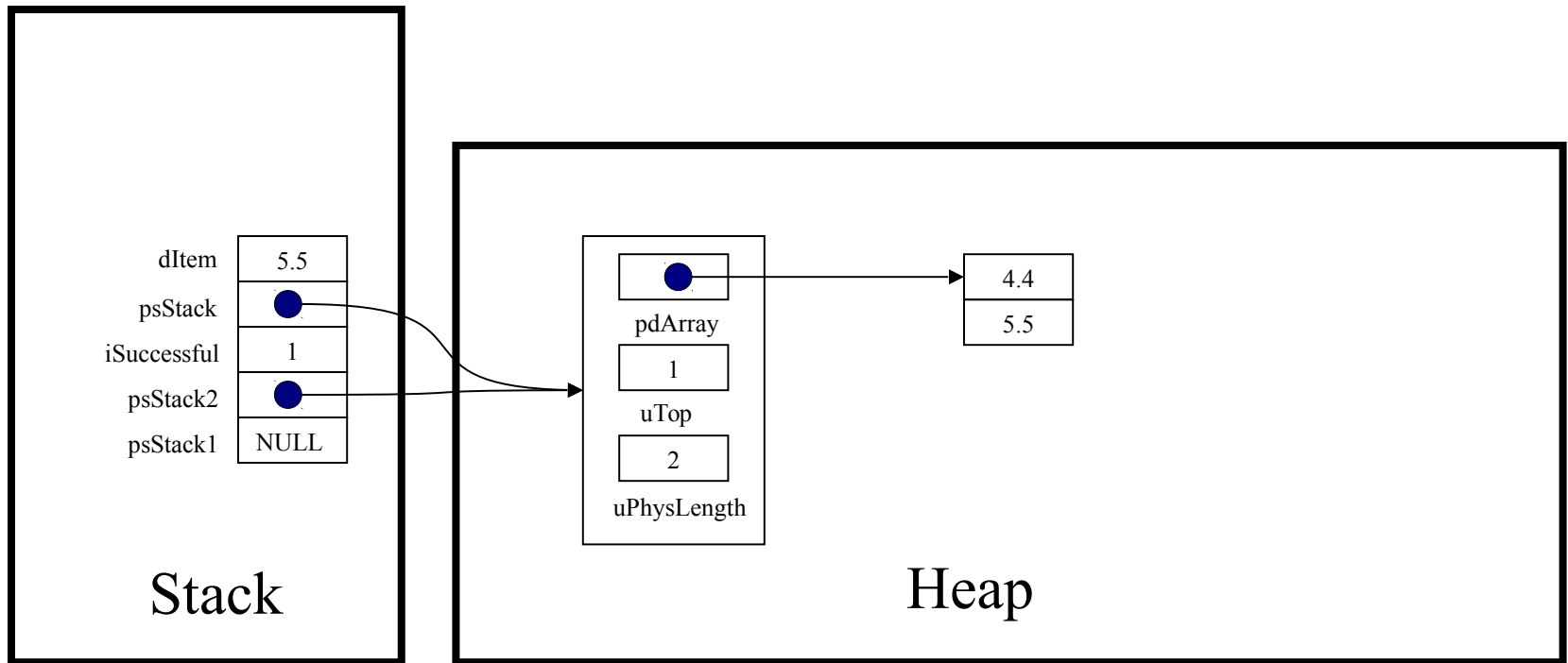
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Trace of teststack (Version 1)

```
if (psStack->uTop == psStack->uPhysLength)  
...
```



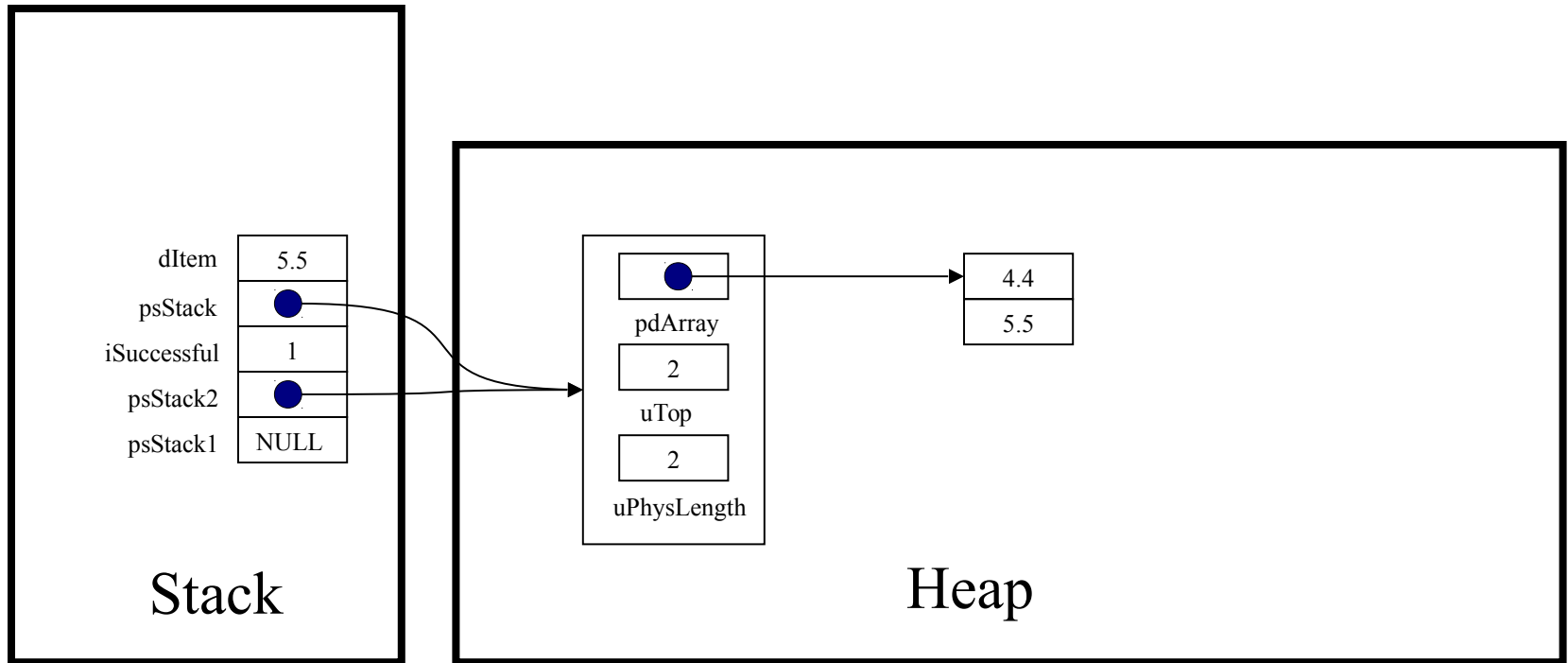
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Trace of teststack (Version 1)

```
(psStack->pdArray)[psStack->uTop] = dItem;
```



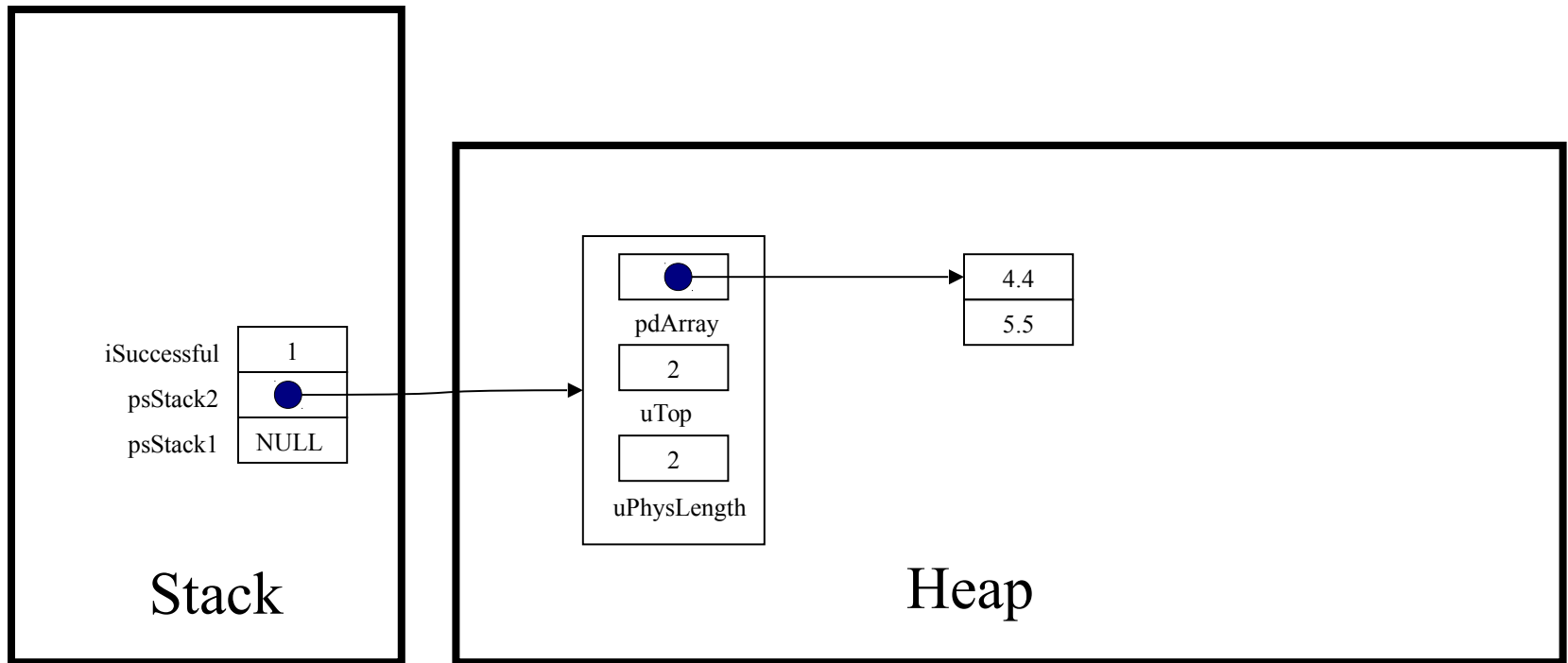
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```
(psStack->uTop) ++;
```



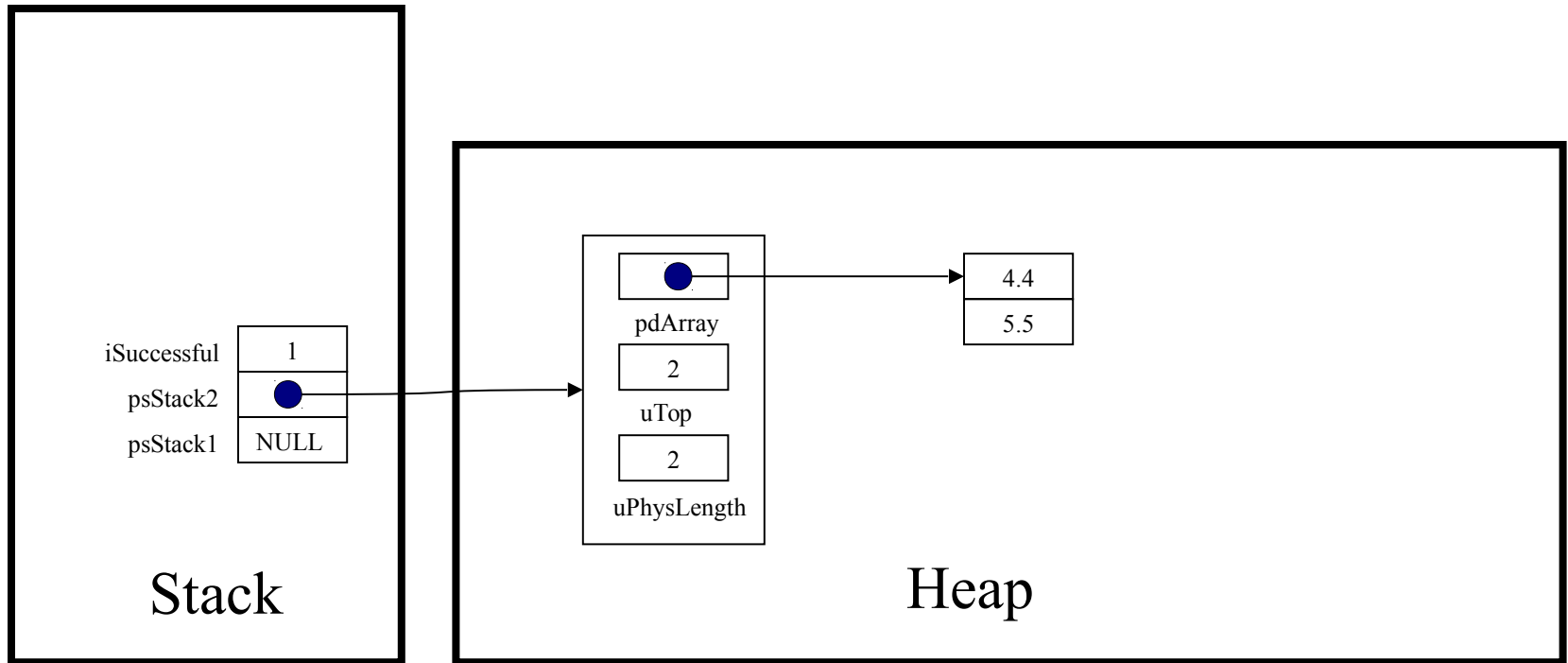
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Trace of teststack (Version 1)

```
return 1;
```



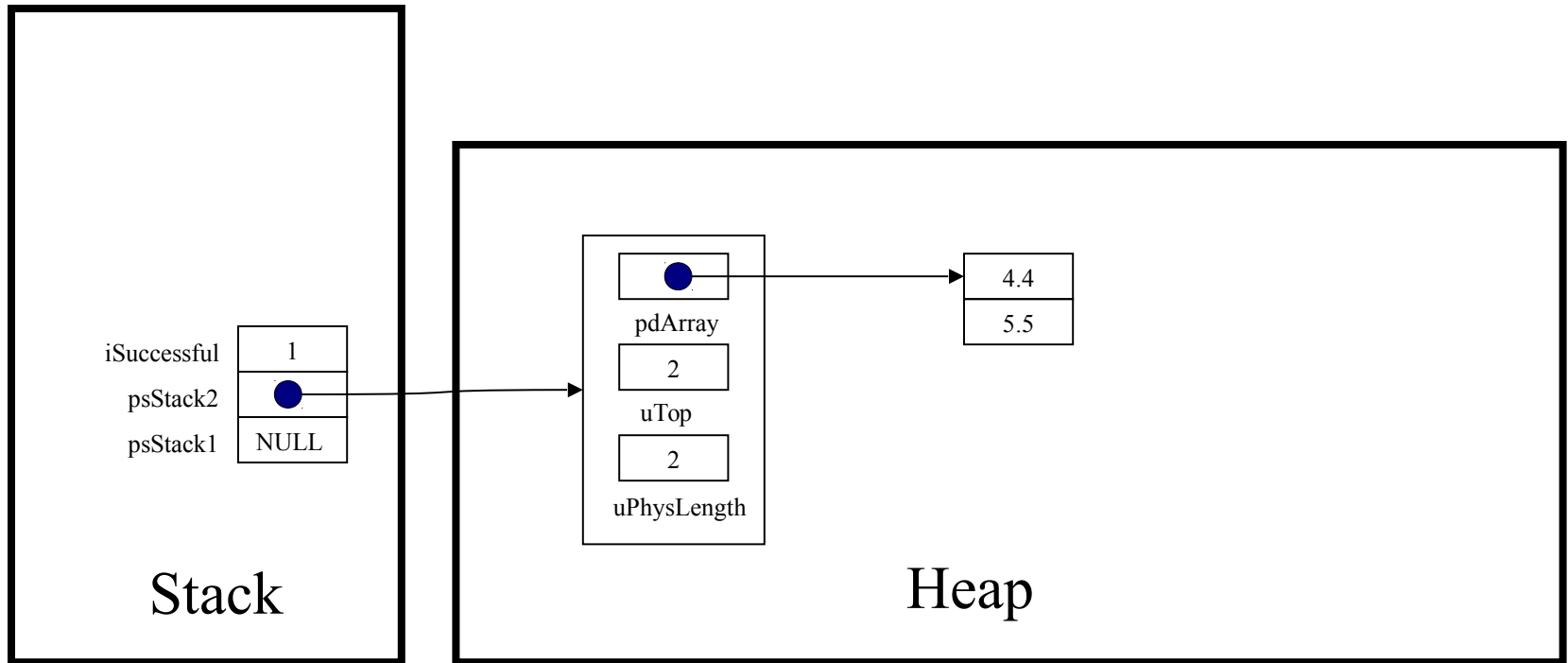
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Trace of teststack (Version 1)

```
iSuccessful = Stack_push(psStack2, 5.5);
```



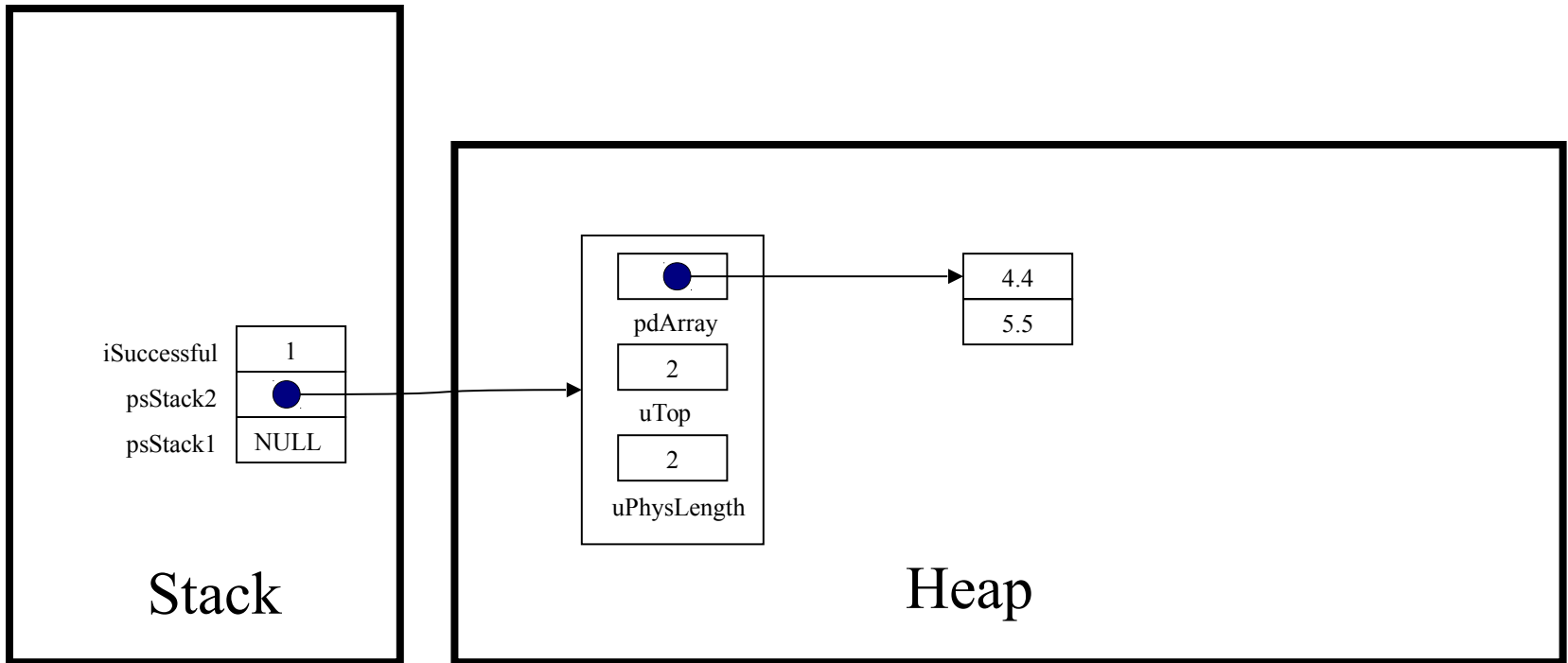
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Trace of teststack (Version 1)

```
if (! iSuccessful) handleMemoryError();
```



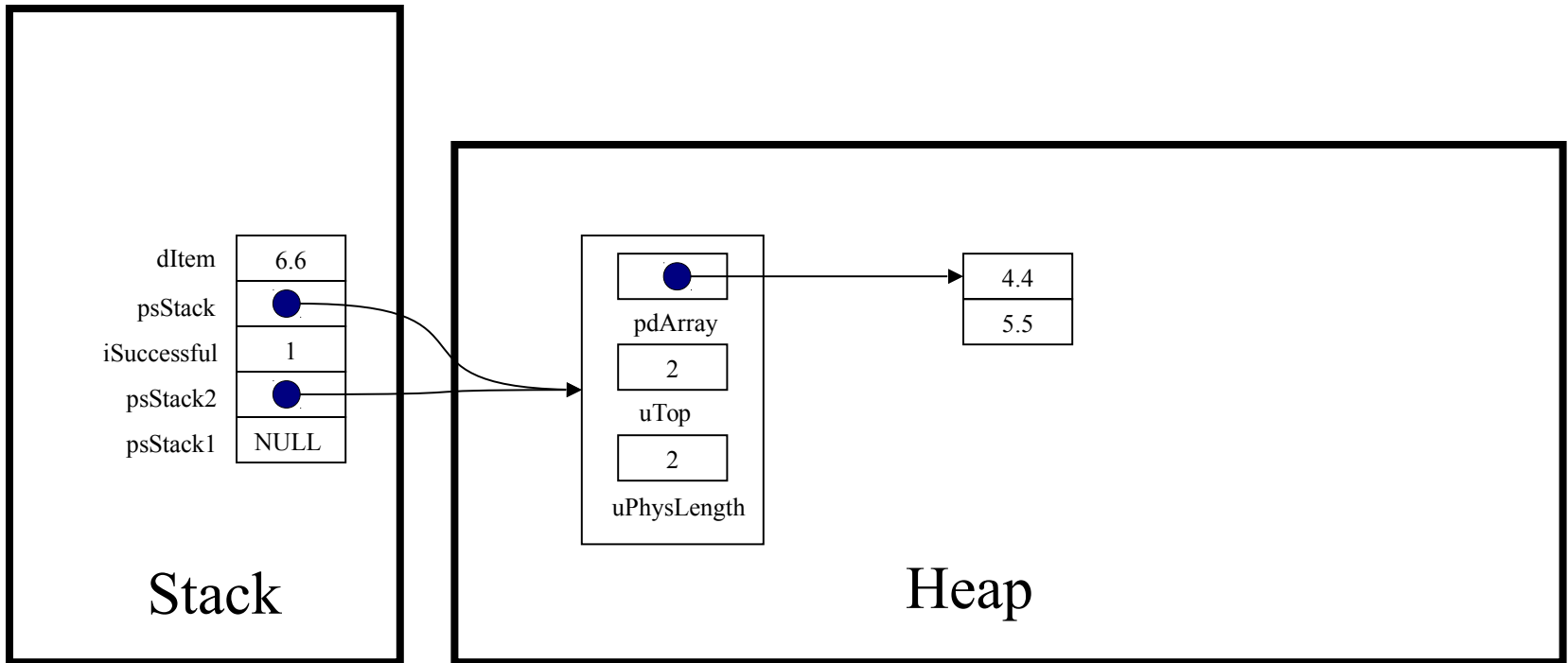
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Trace of teststack (Version 1)

```
iSuccessful = Stack_push(psStack2, 6.6);
```



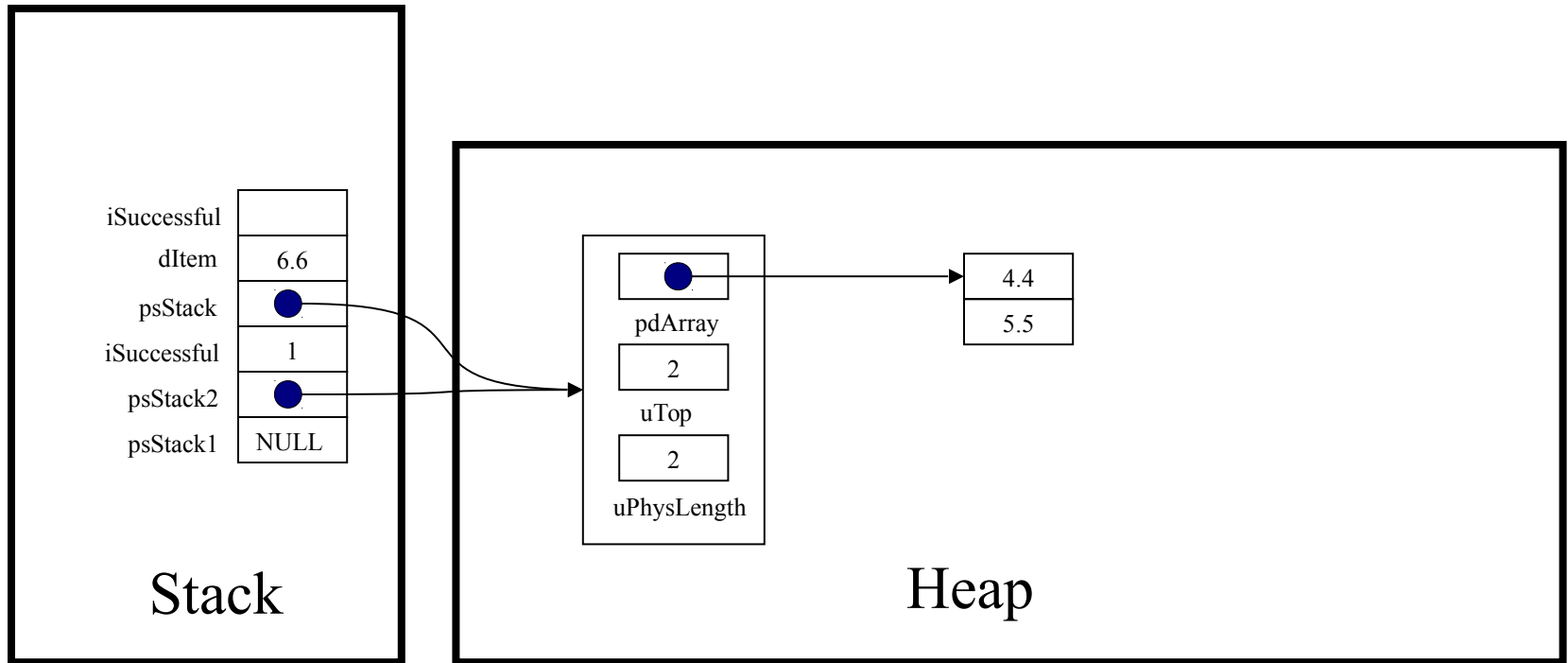
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Trace of teststack (Version 1)

```
int Stack_push(struct Stack *psStack, double dItem)
```



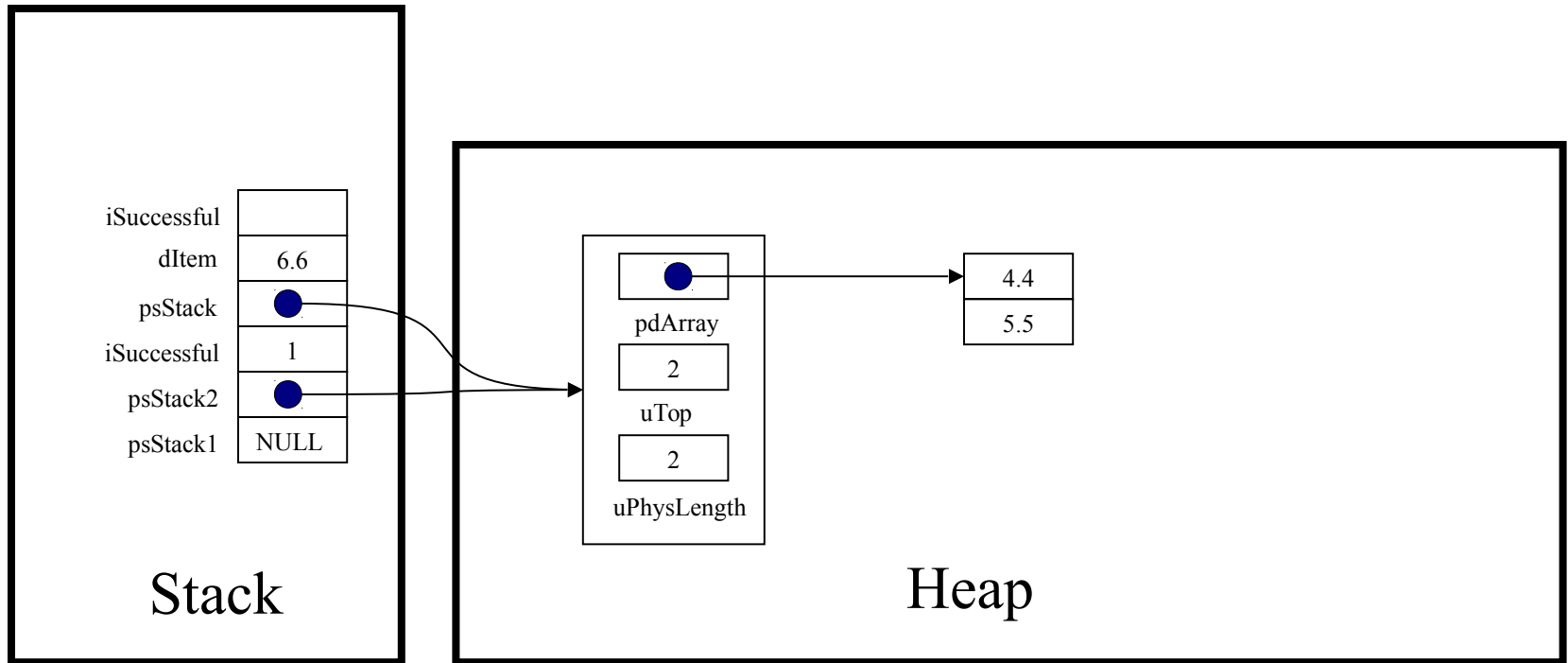
Princeton University
COS 217: Introduction to Programming Systems
Trace of teststack (Version 1)

```
int iSuccessful;
```



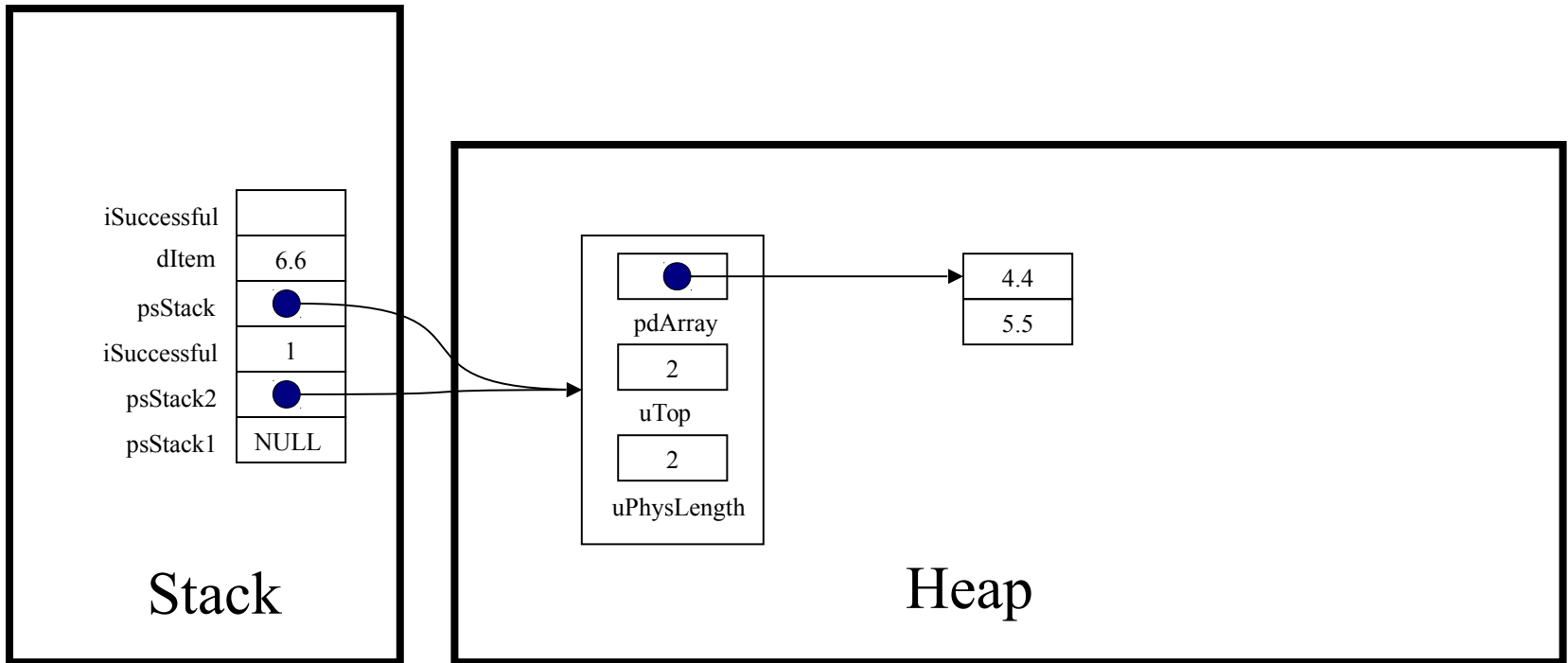
Princeton University
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



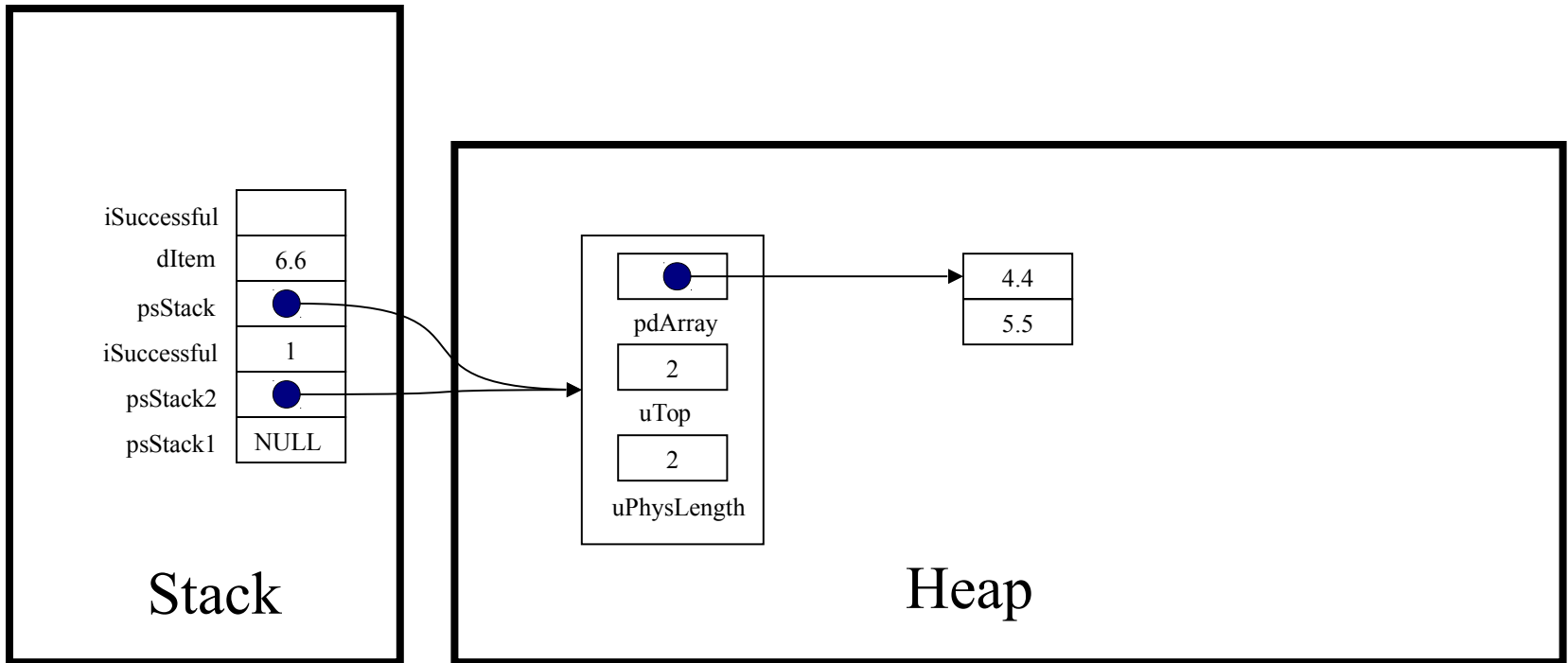
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Trace of teststack (Version 1)

```
if (psStack->uTop == psStack->uPhysLength)
```



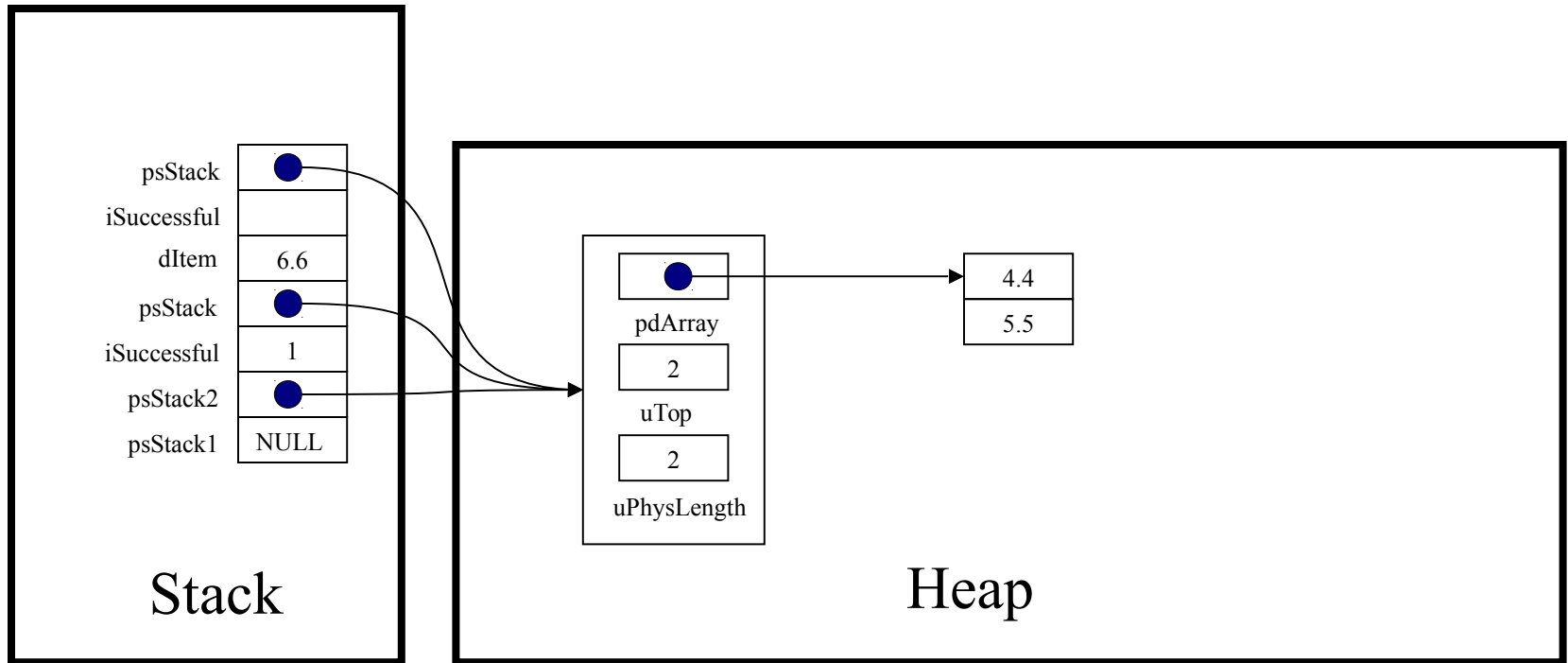
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Trace of teststack (Version 1)

```
iSuccessful = Stack_grow(psStack);
```



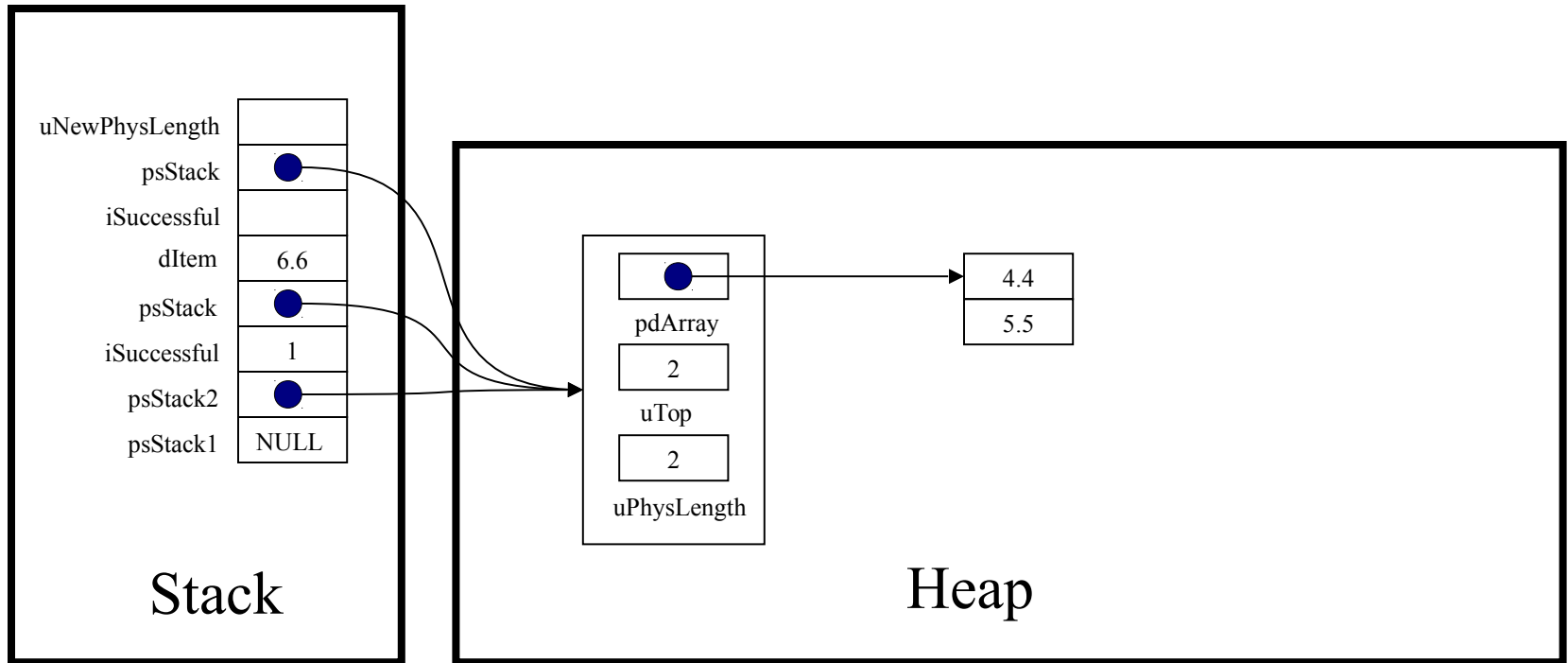
Princeton University
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Trace of teststack (Version 1)

```
static int Stack_grow(struct Stack *psStack)
```



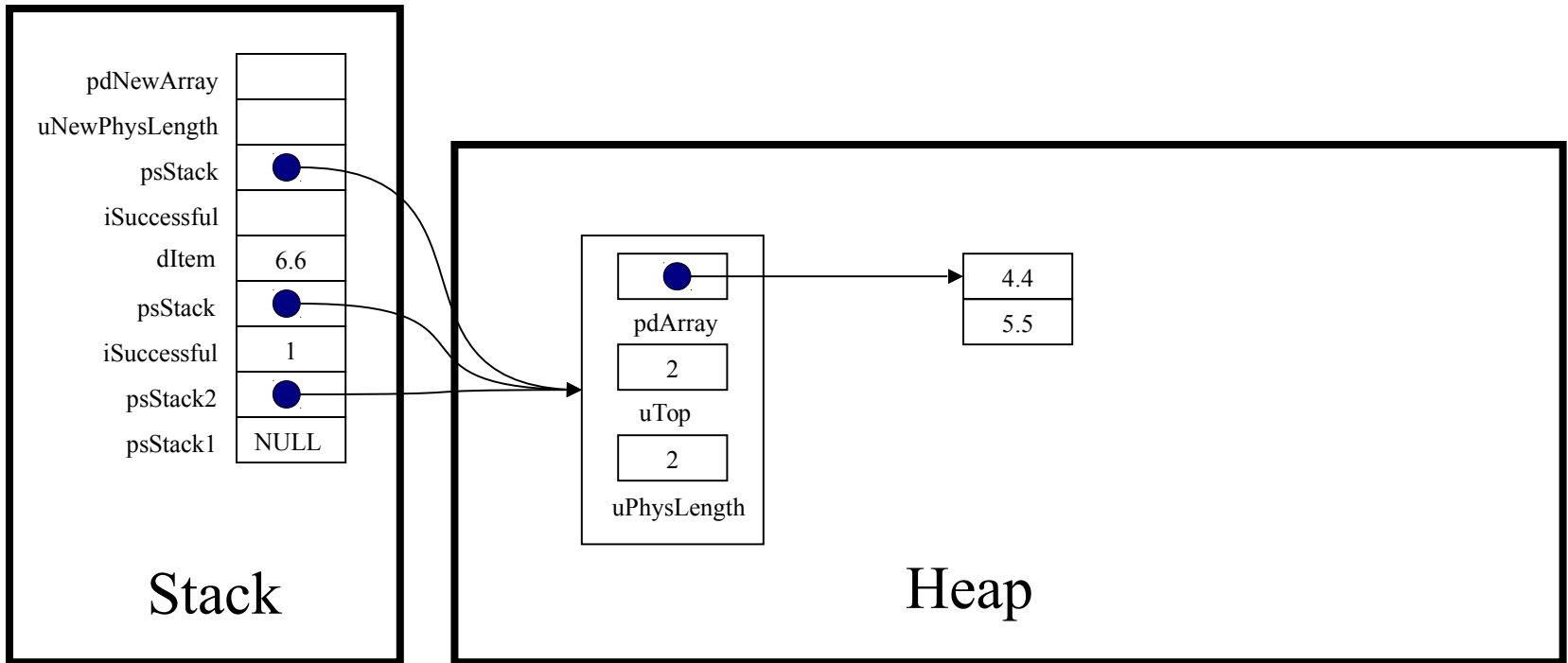
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Trace of teststack (Version 1)

```
size_t uNewPhysLength;
```



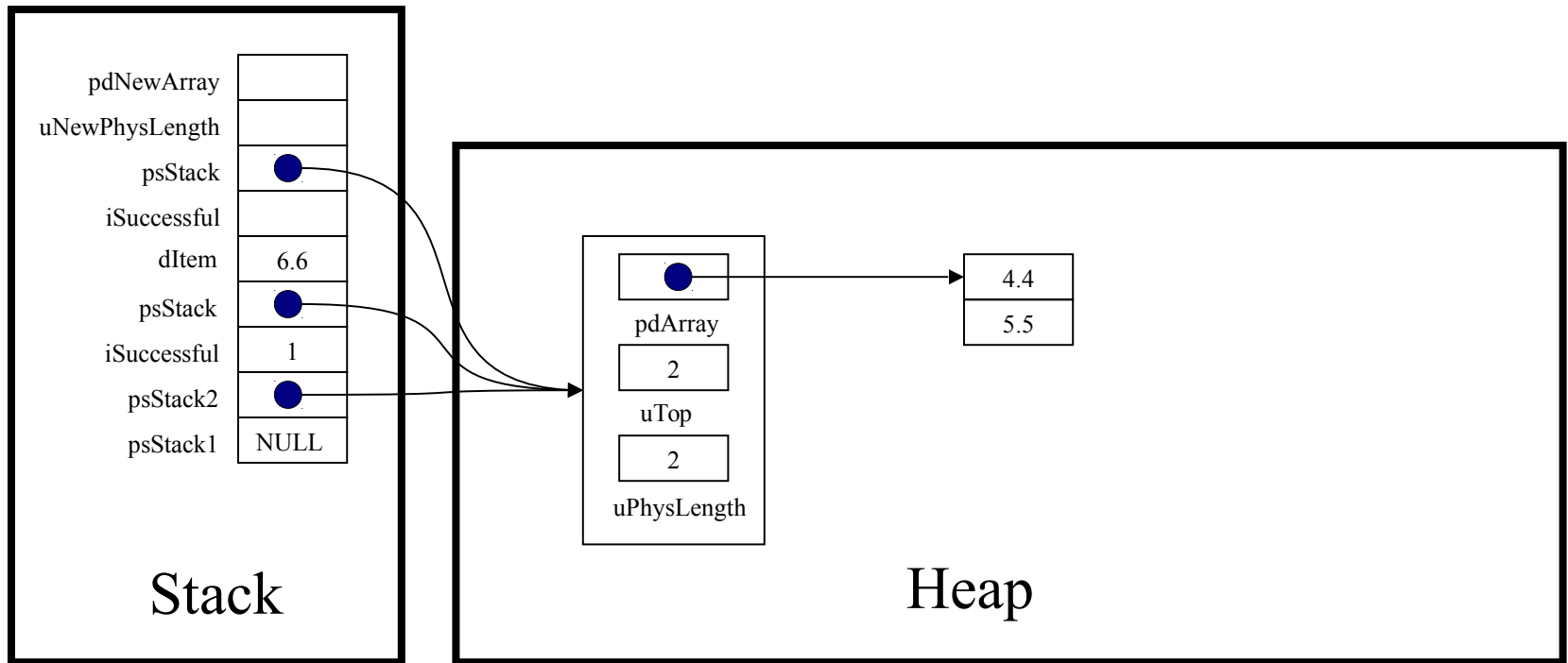
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Trace of teststack (Version 1)

```
double *pdNewArray;
```



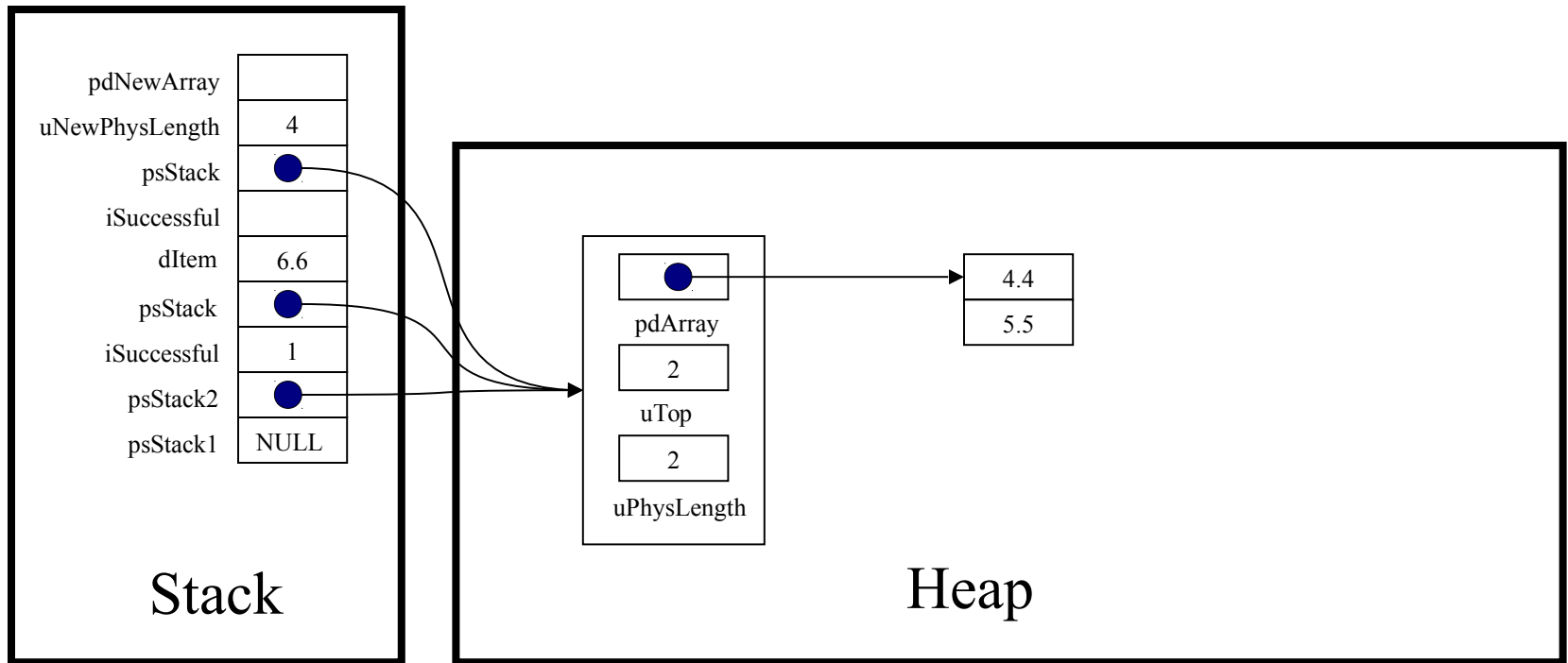
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



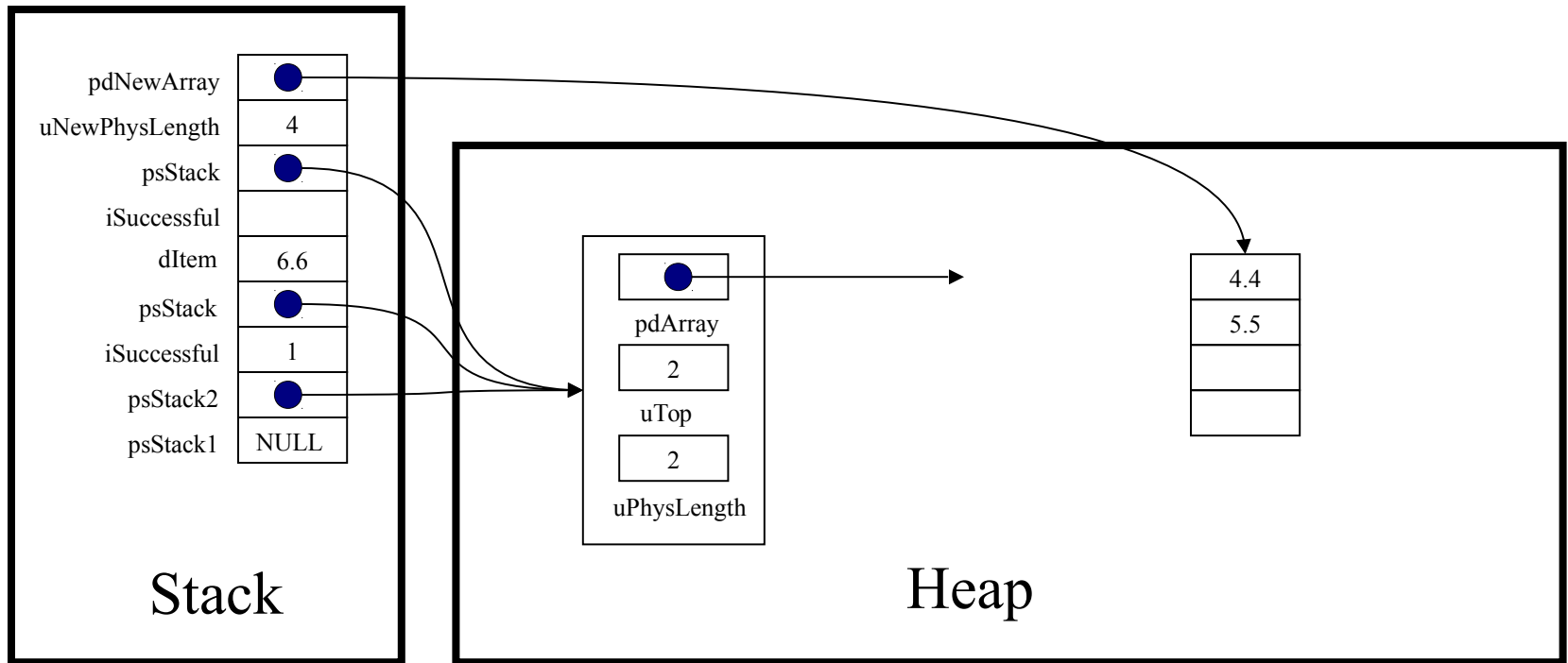
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Trace of teststack (Version 1)

```
uNewPhysLength = GROWTH_FACTOR * pcStack->uPhysLength;
```



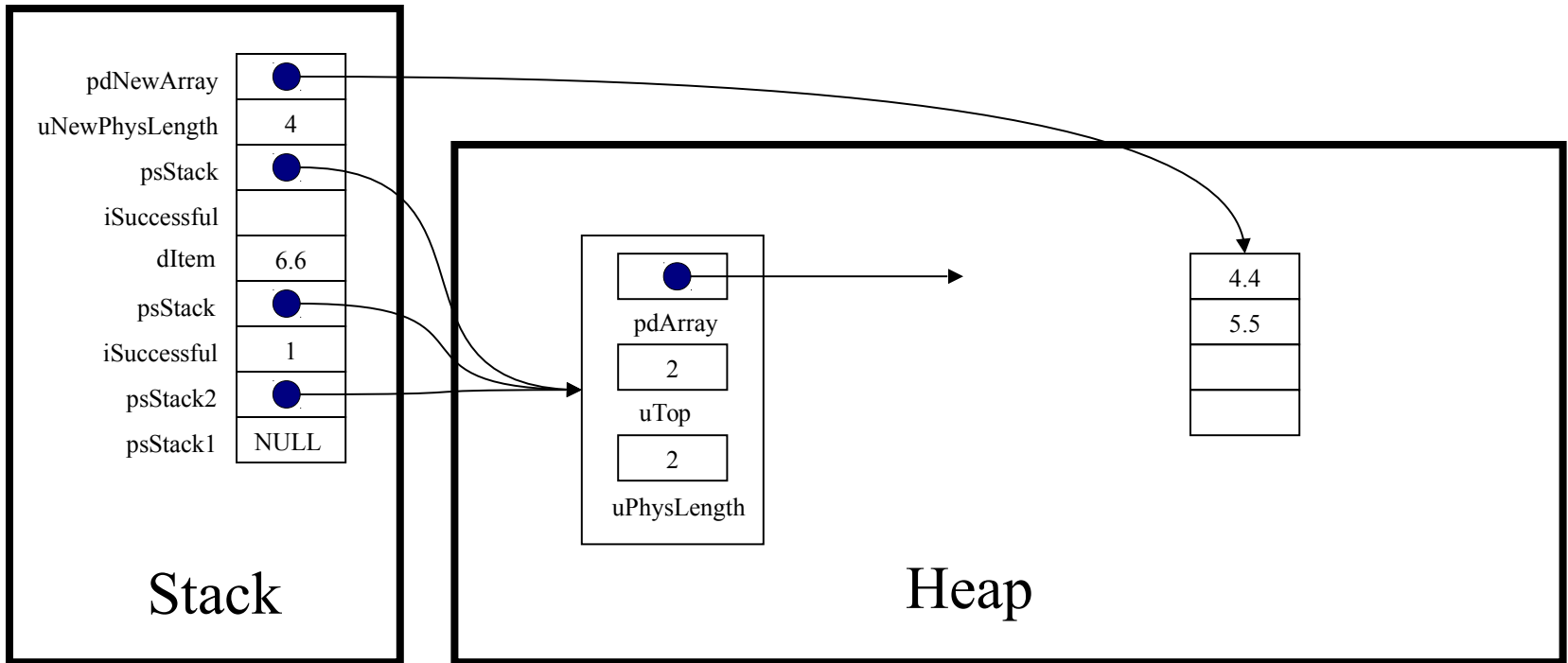
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Trace of teststack (Version 1)

```
pdNewArray = (double*)  
  realloc(psStack->pdArray, sizeof(double) * uNewPhysLength);
```



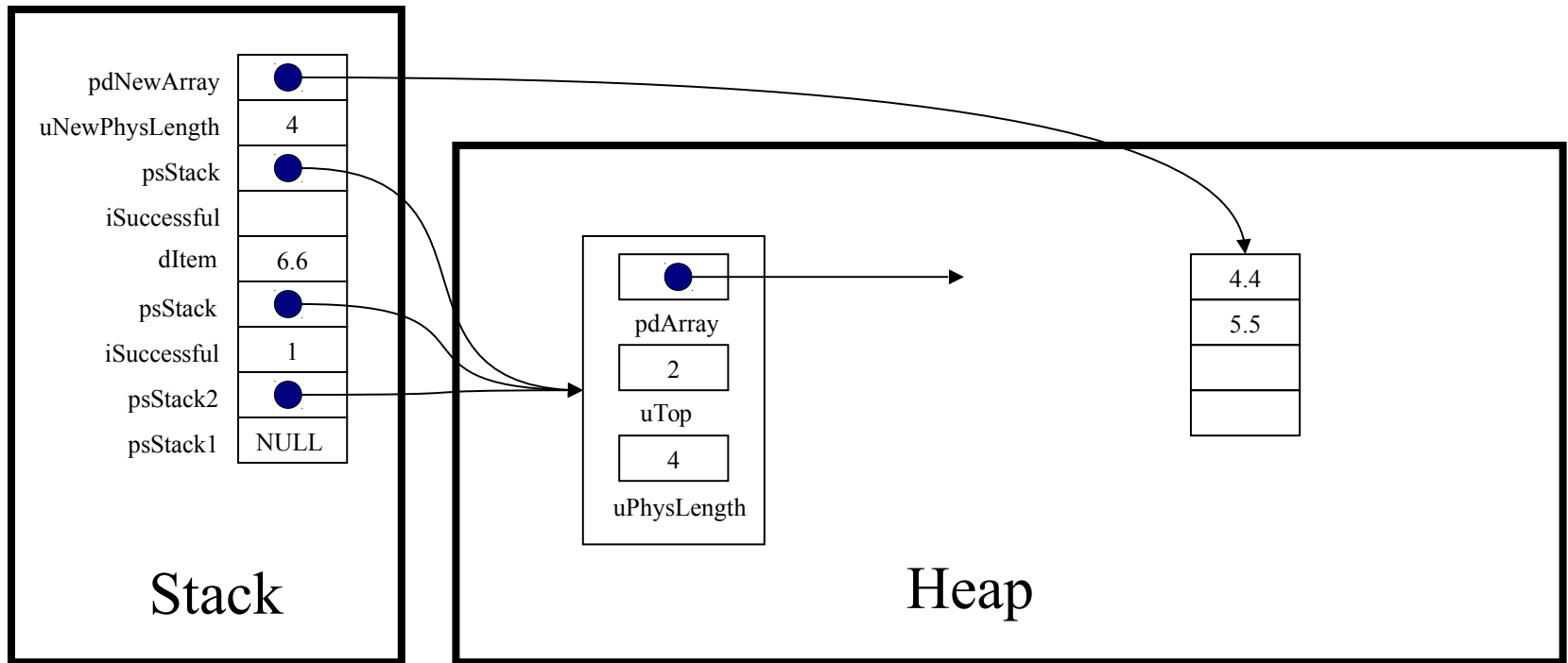
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Trace of teststack (Version 1)

```
if (pdNewArray == NULL)  
    return 0;
```



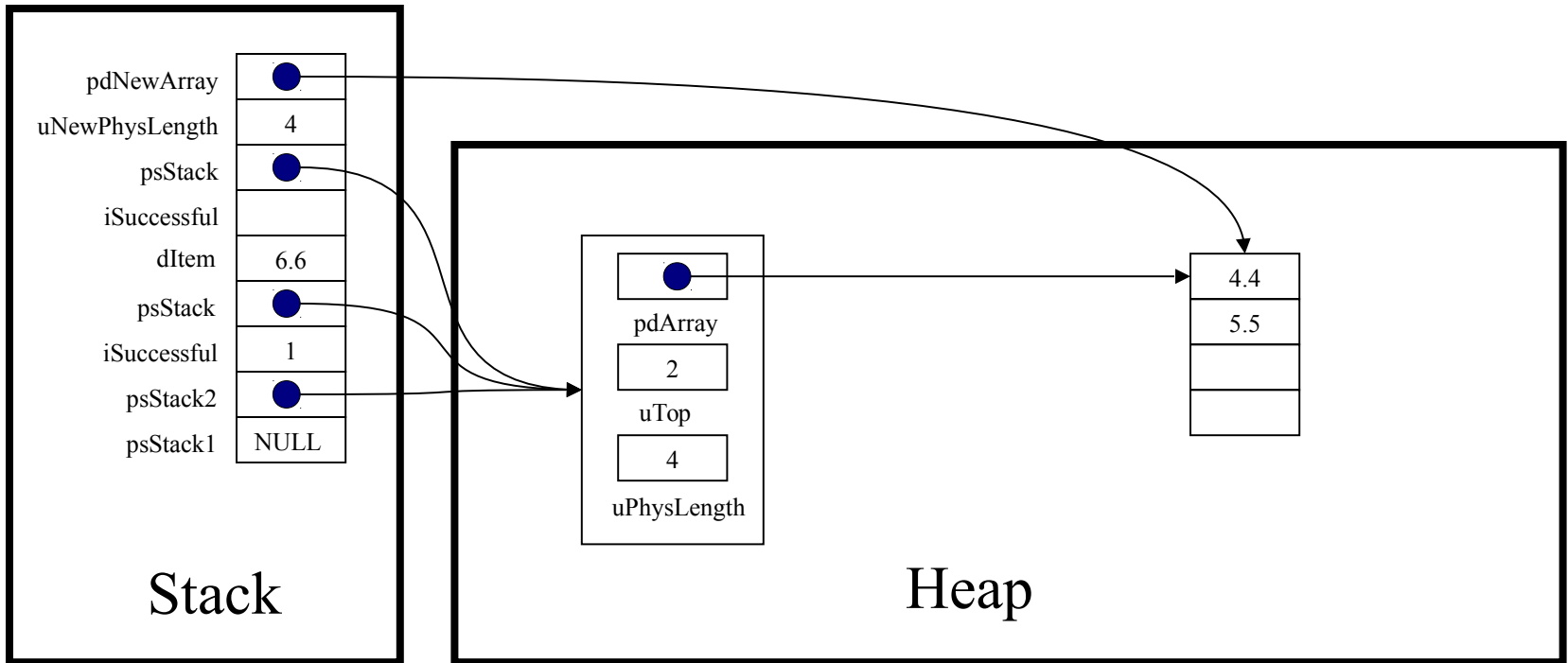
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```
psStack->uPhysLength = uNewPhysLength;
```



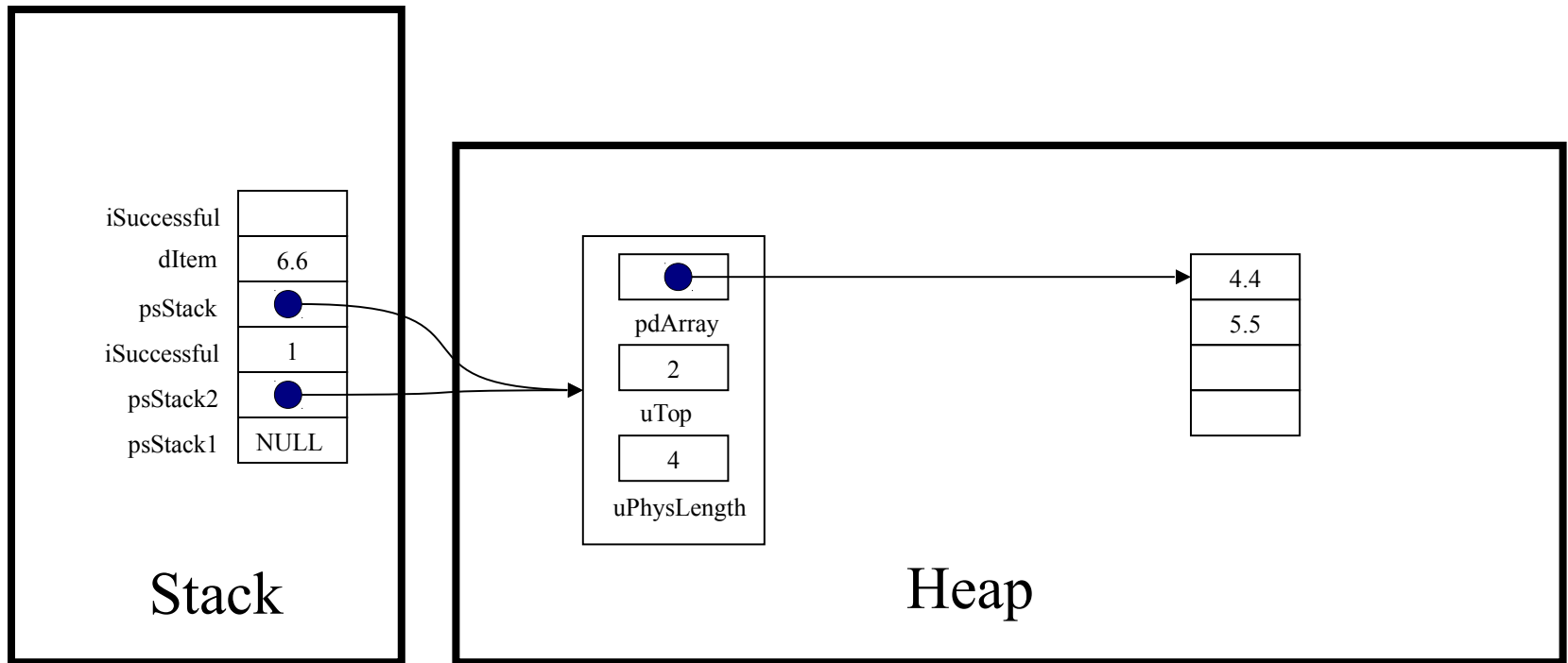
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Trace of teststack (Version 1)

```
psStack->pdArray = pdNewArray;
```



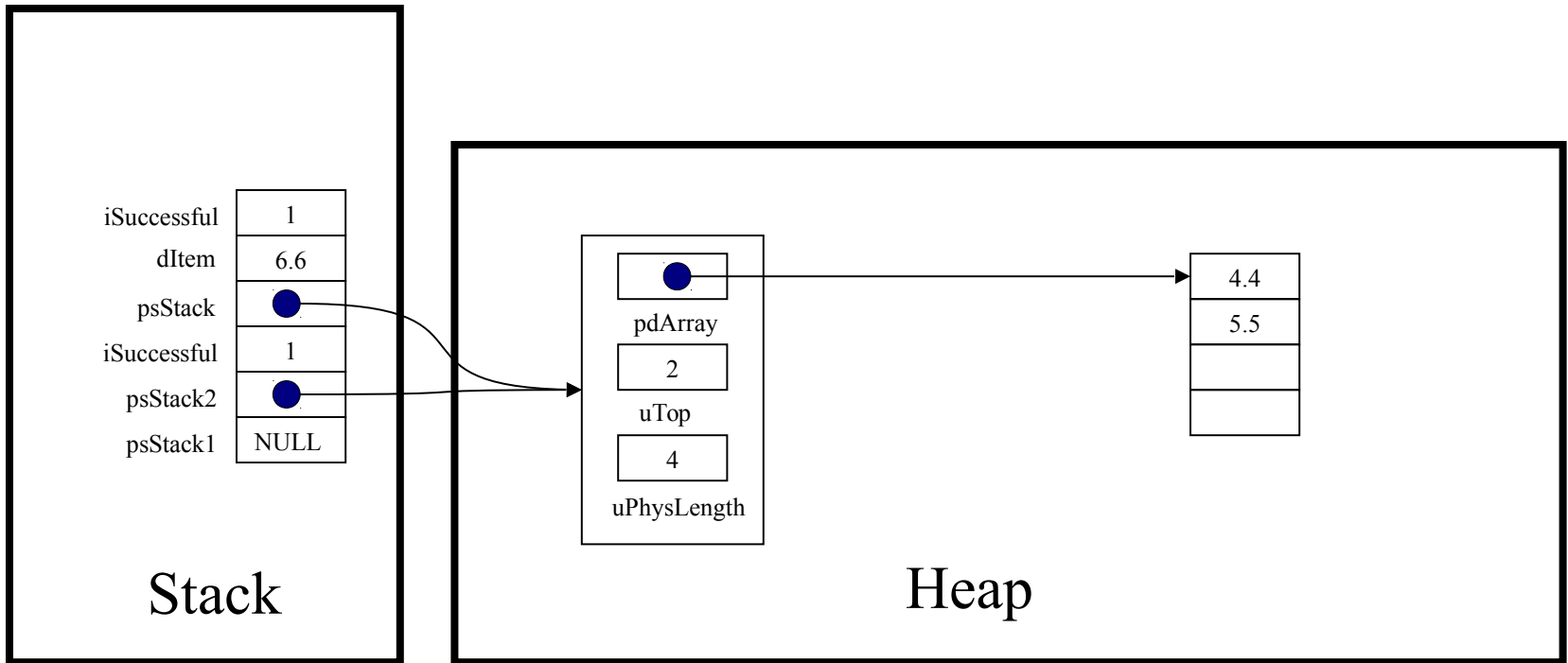
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Trace of teststack (Version 1)

```
return 1;
```



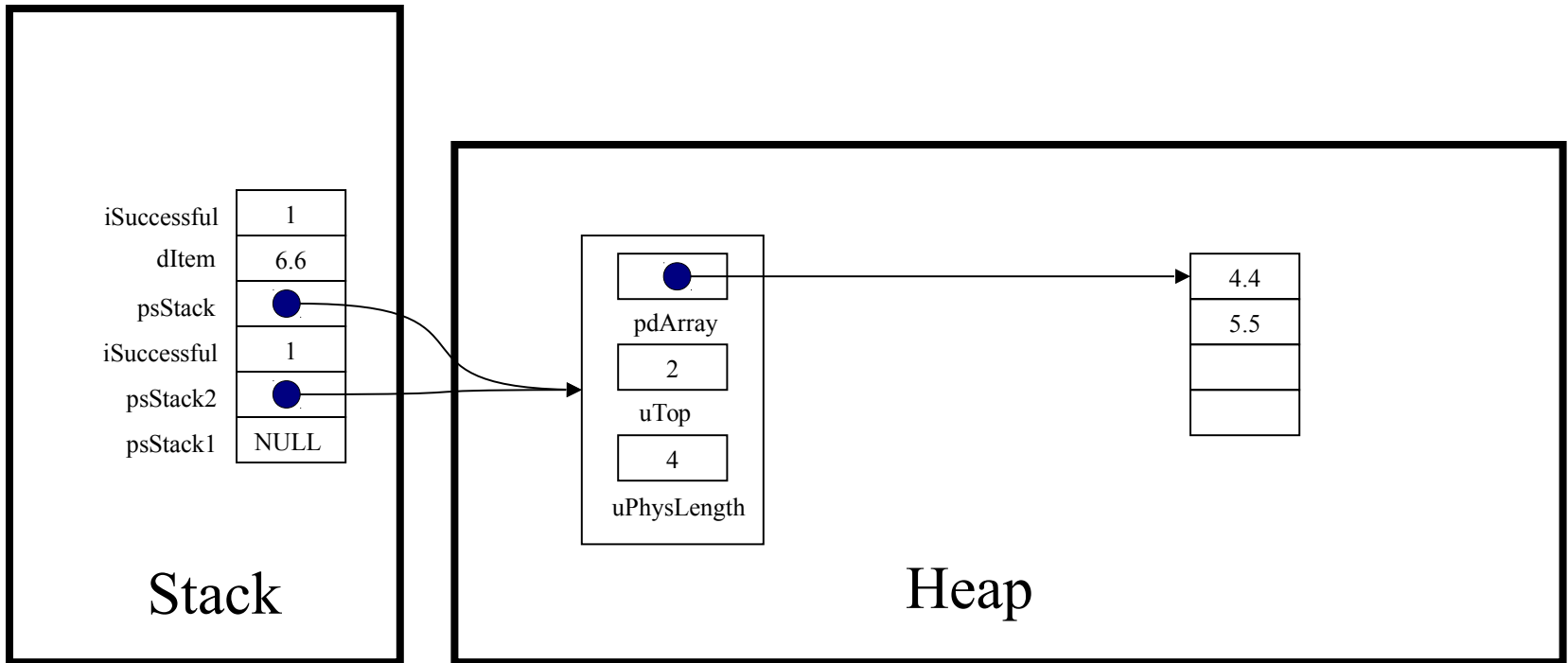
Princeton University
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Trace of teststack (Version 1)

```
iSuccessful = Stack_grow(psStack);
```



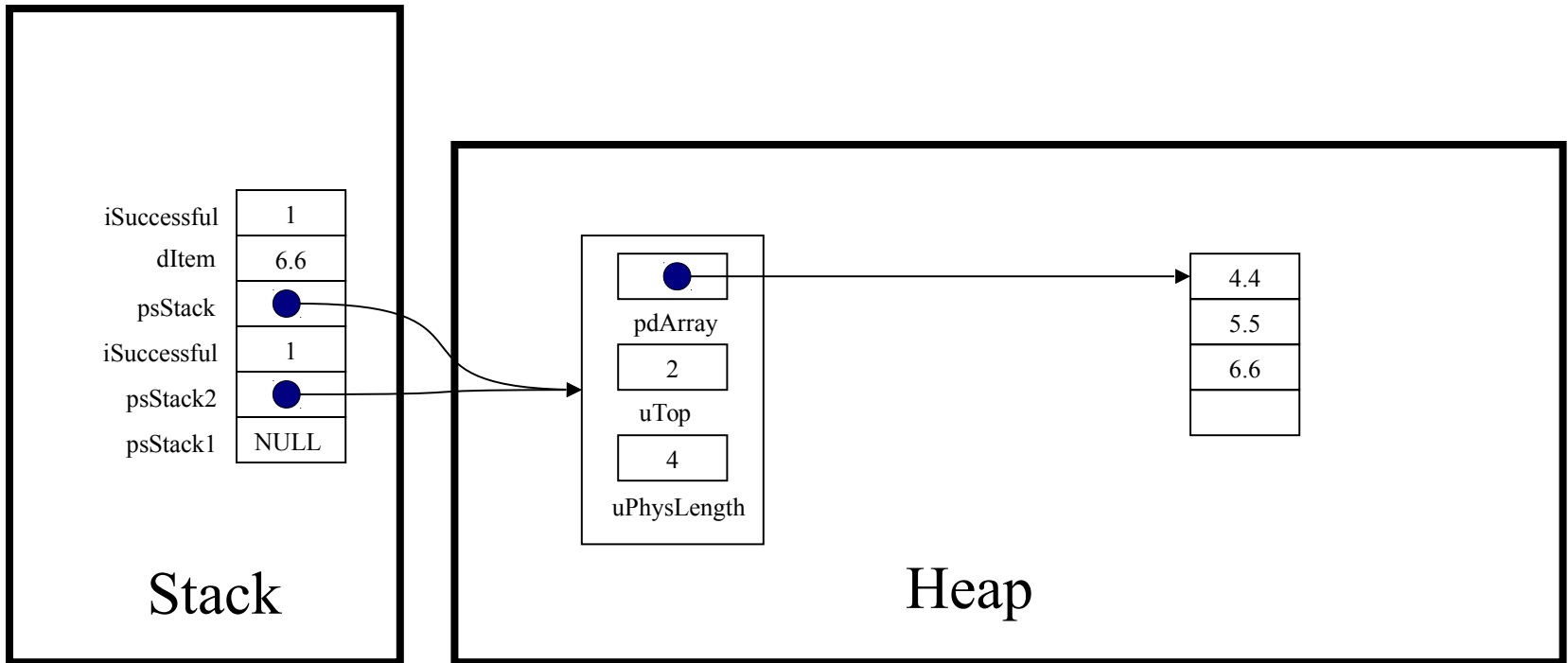
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Trace of teststack (Version 1)

```
if (! iSuccessful)  
    return 0;
```



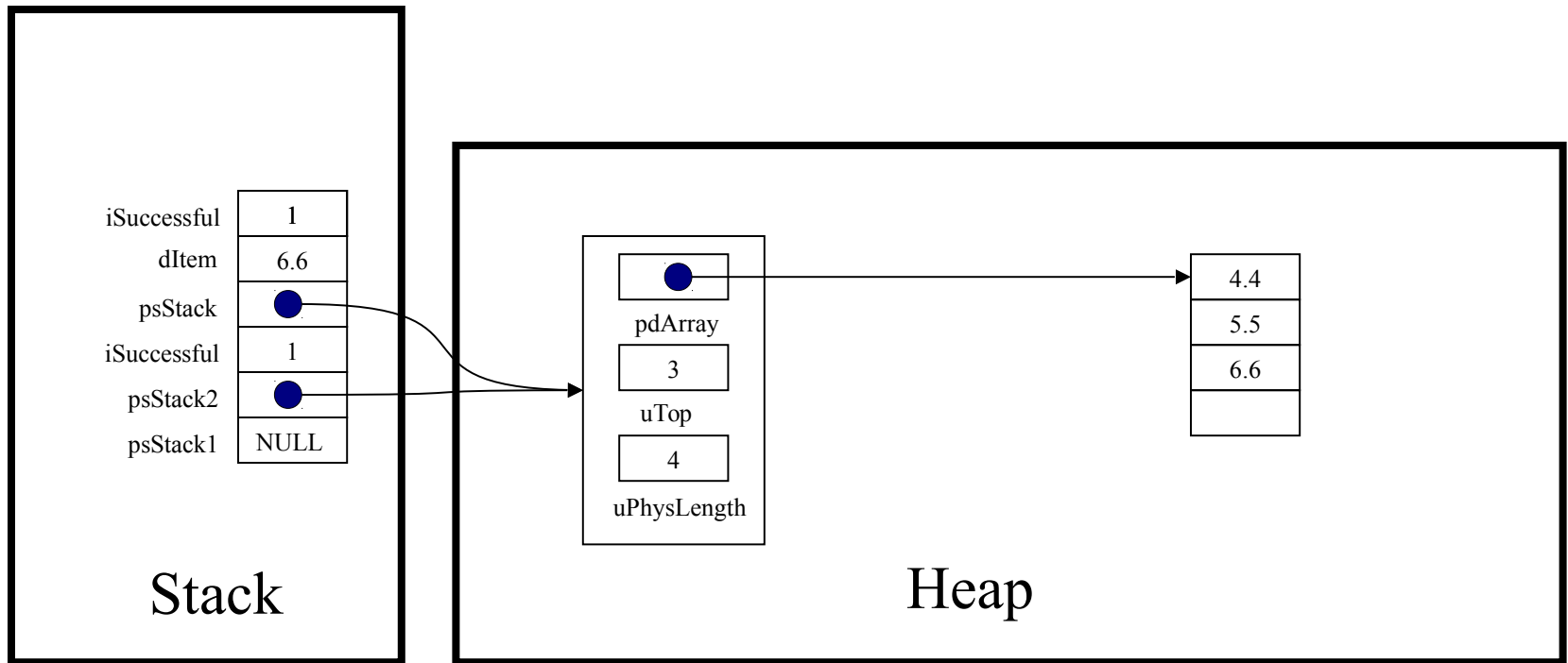
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Trace of teststack (Version 1)

```
(psStack->pdArray)[psStack->uTop] = dItem;
```



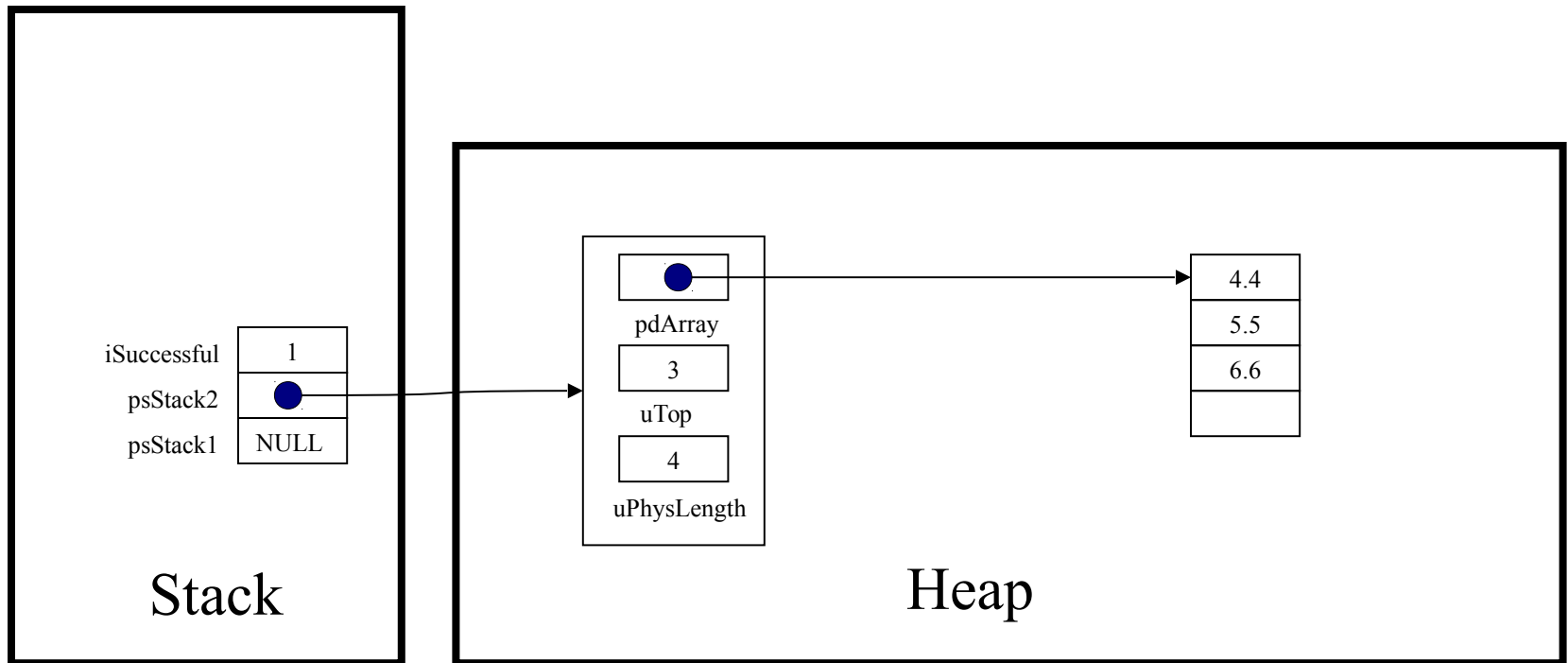
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Trace of teststack (Version 1)

```
(psStack->uTop) ++;
```



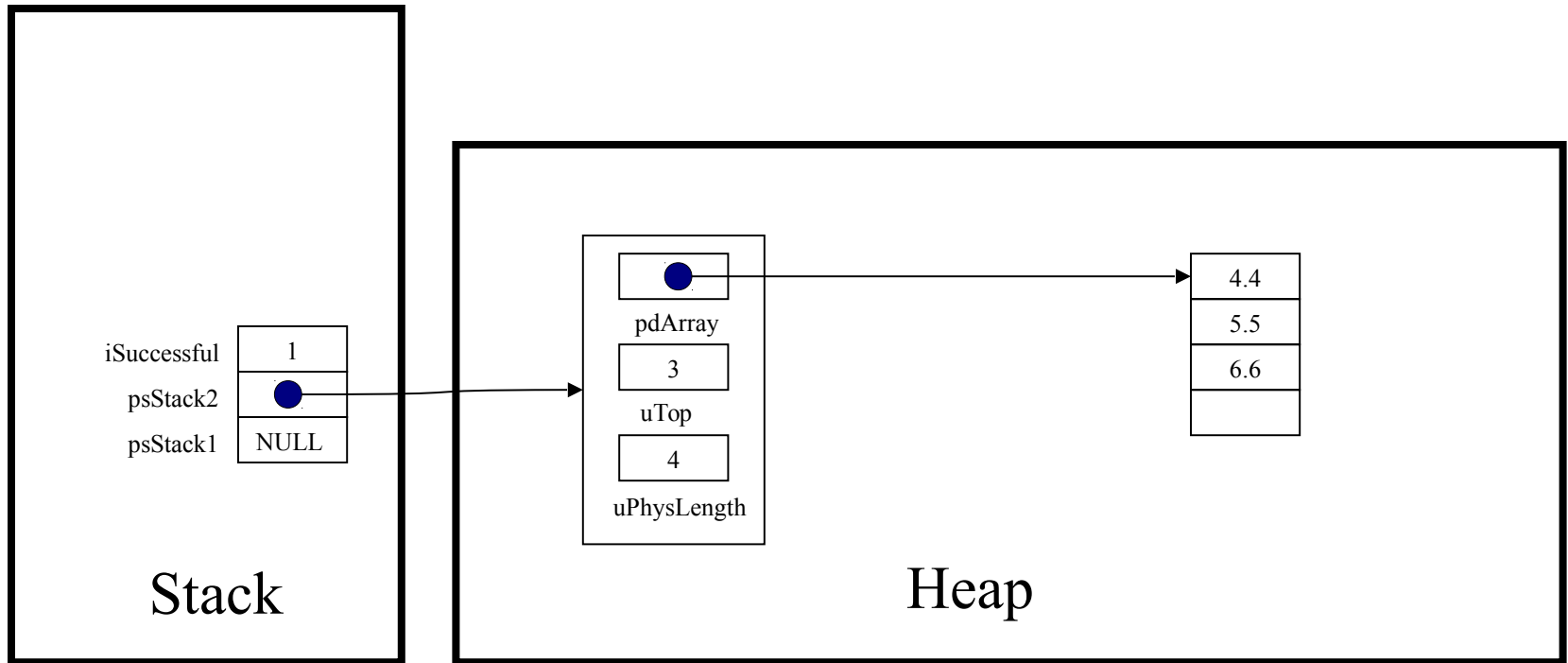
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Trace of teststack (Version 1)

```
return 1;
```



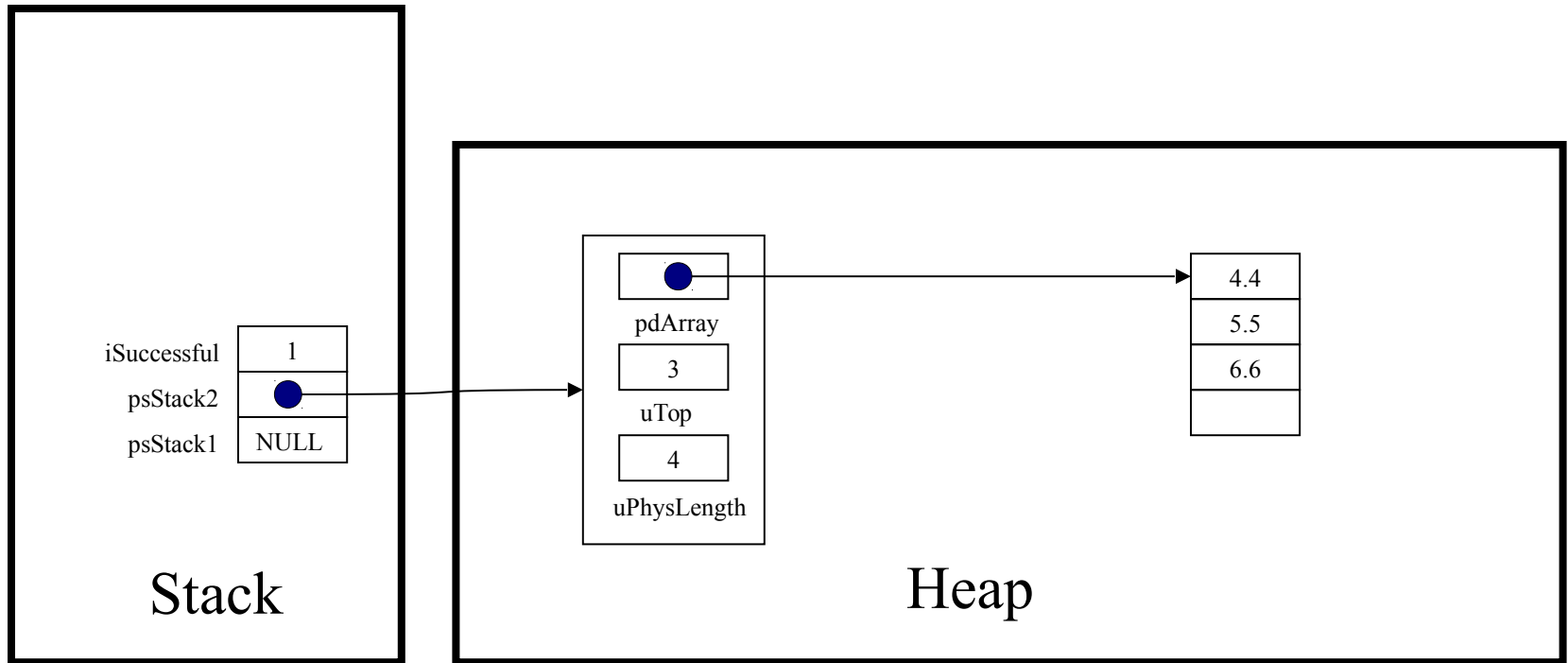
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Trace of teststack (Version 1)

```
iSuccessful = Stack_push(psStack2, 6.6);
```



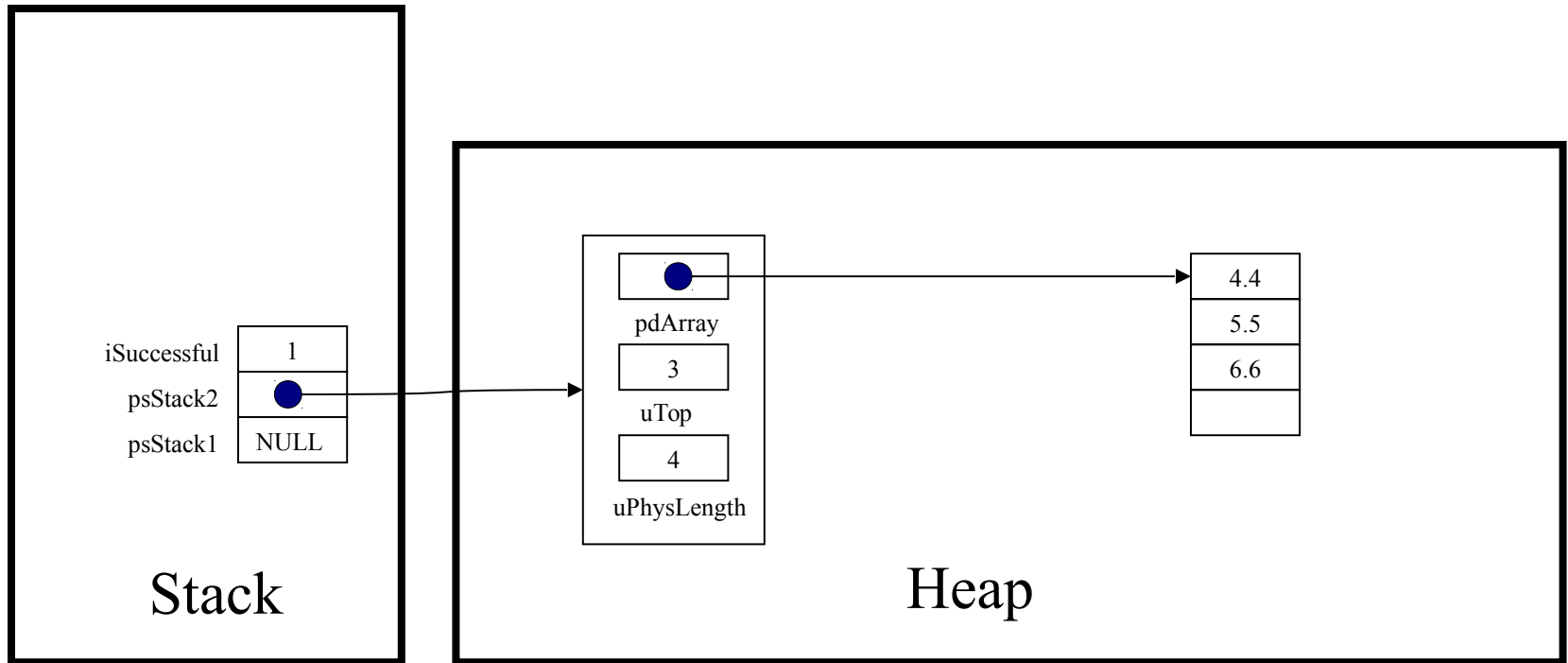
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```
if (! iSuccessful) handleMemoryError();
```



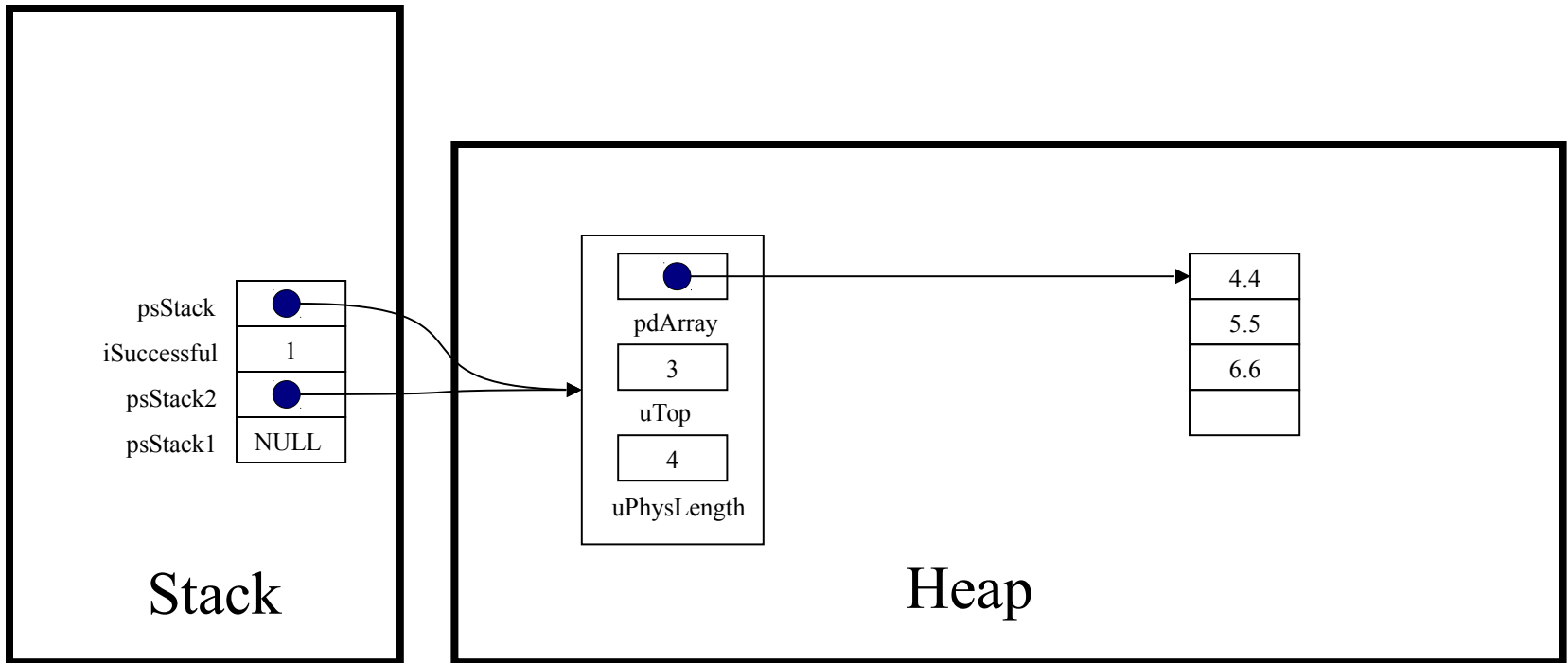
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack2))  
    ...
```



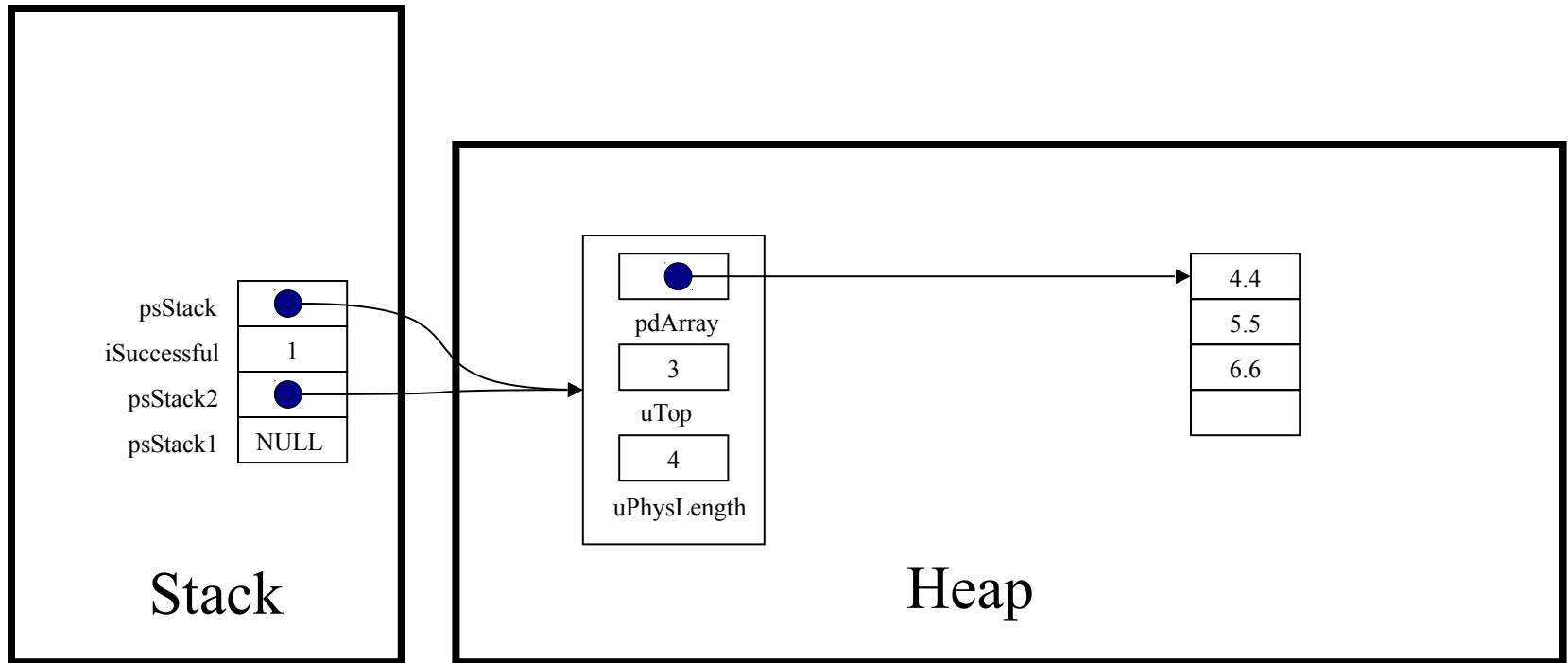
Princeton University
COS 217: Introduction to Programming Systems
Trace of teststack (Version 1)

```
int Stack_isEmpty(struct Stack *psStack)
```



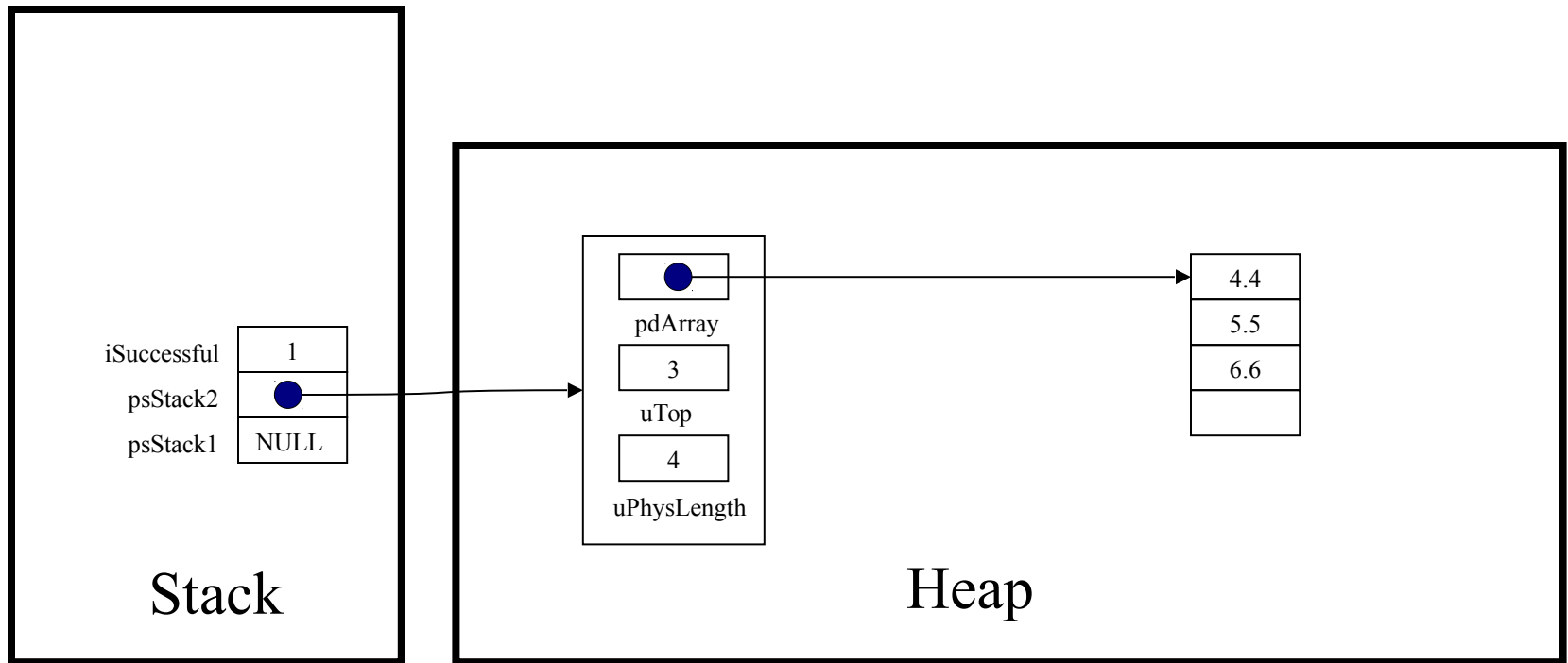
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



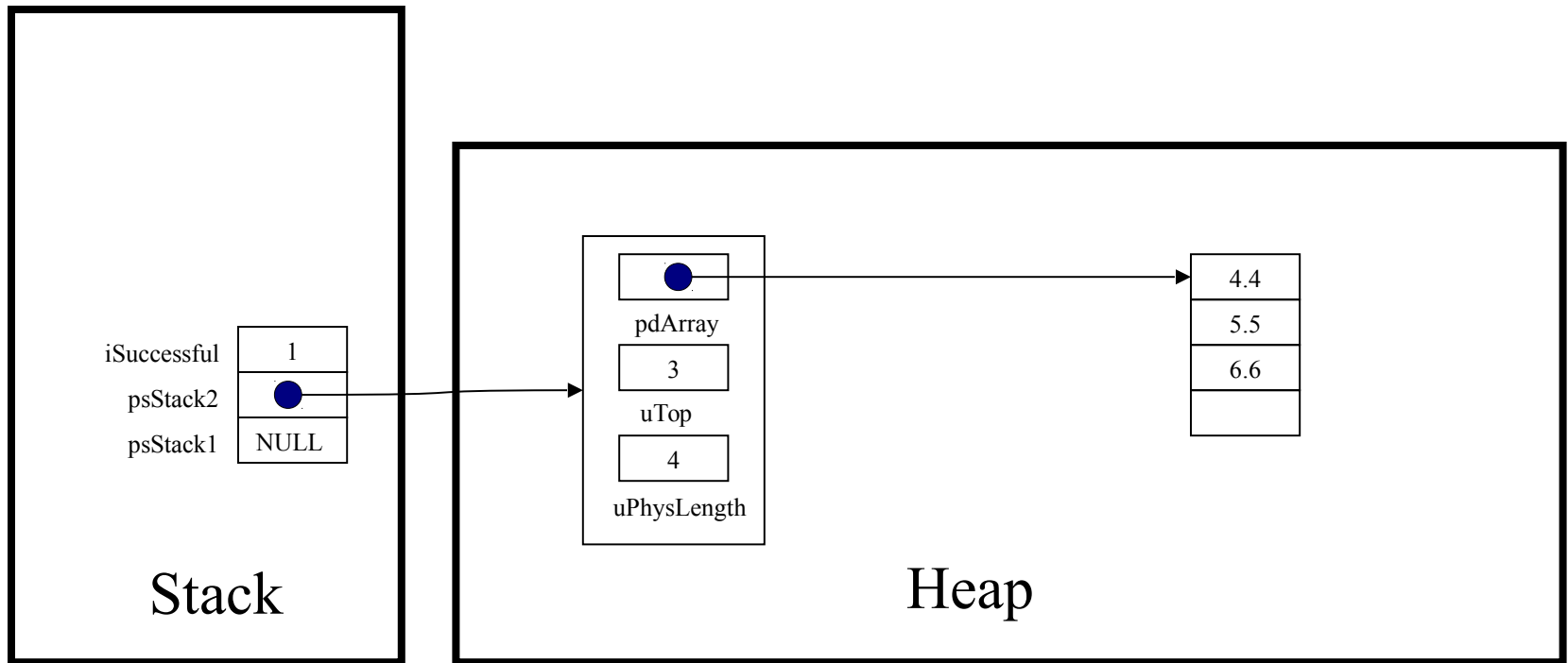
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Trace of teststack (Version 1)

```
return psStack->uTop == 0;
```



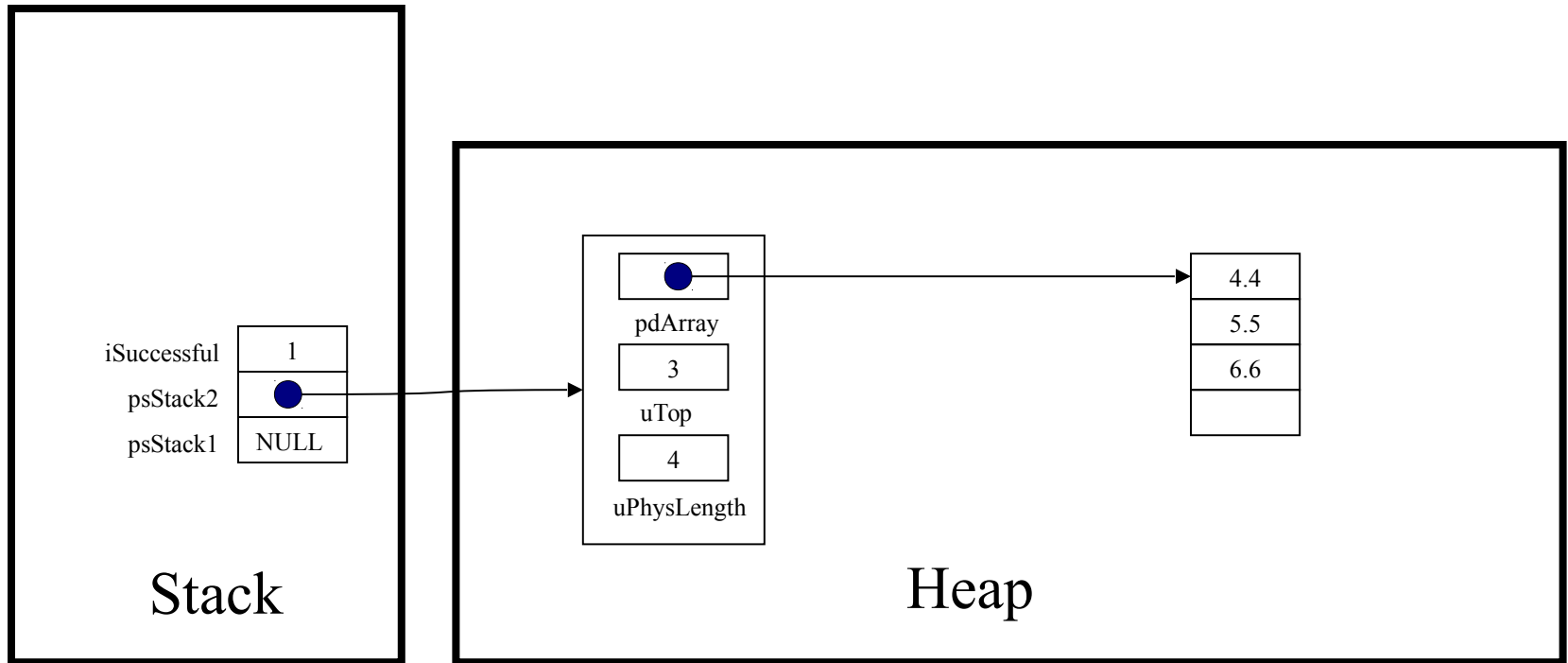
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack2))
```



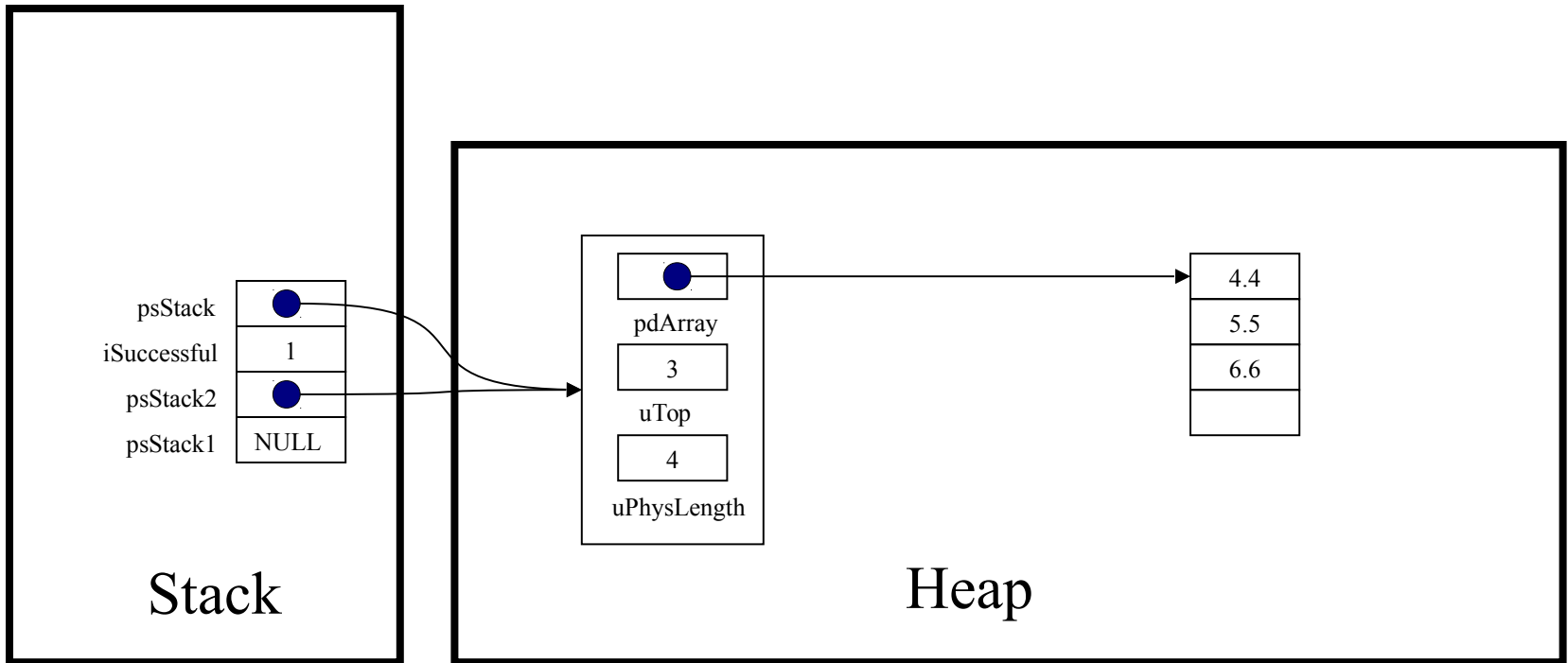
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Trace of teststack (Version 1)

```
printf("%g\n", Stack_pop(psStack2));
```



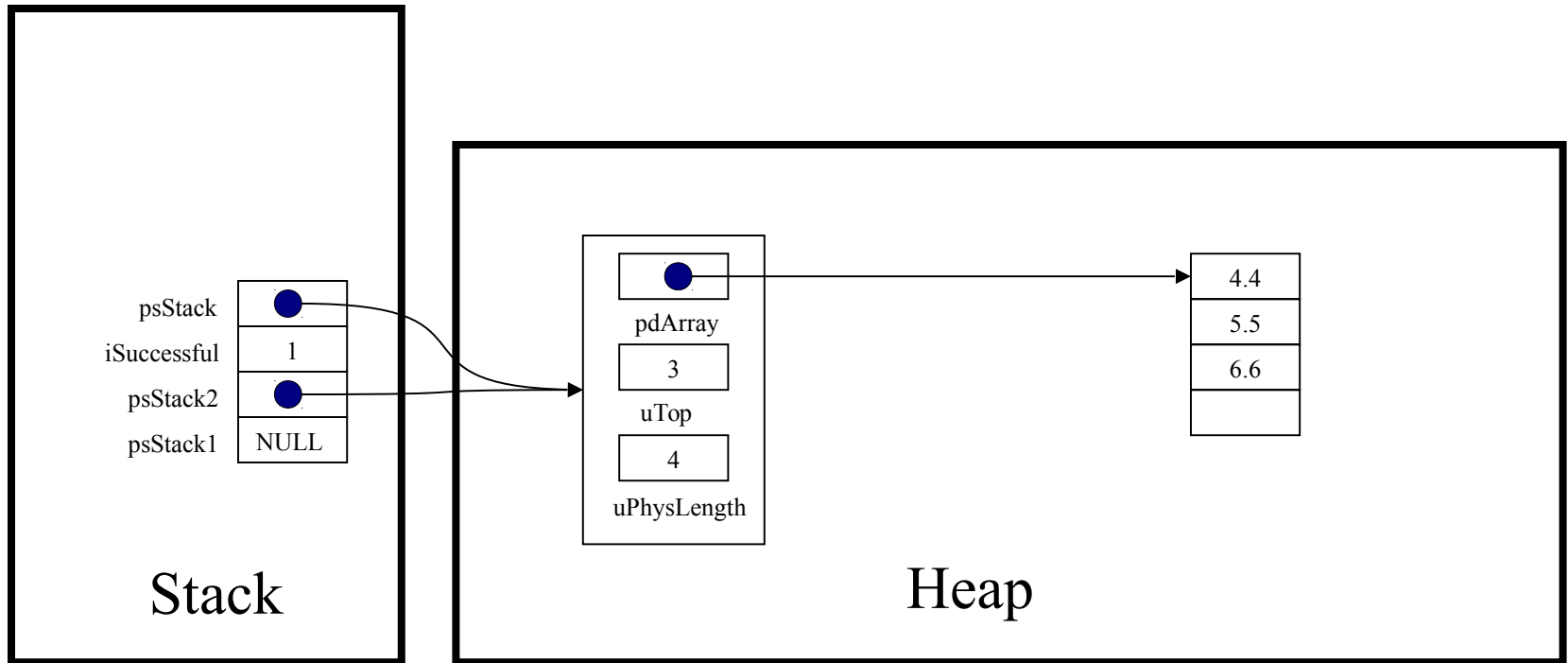
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Trace of teststack (Version 1)

```
double Stack_pop(struct Stack *psStack)
```



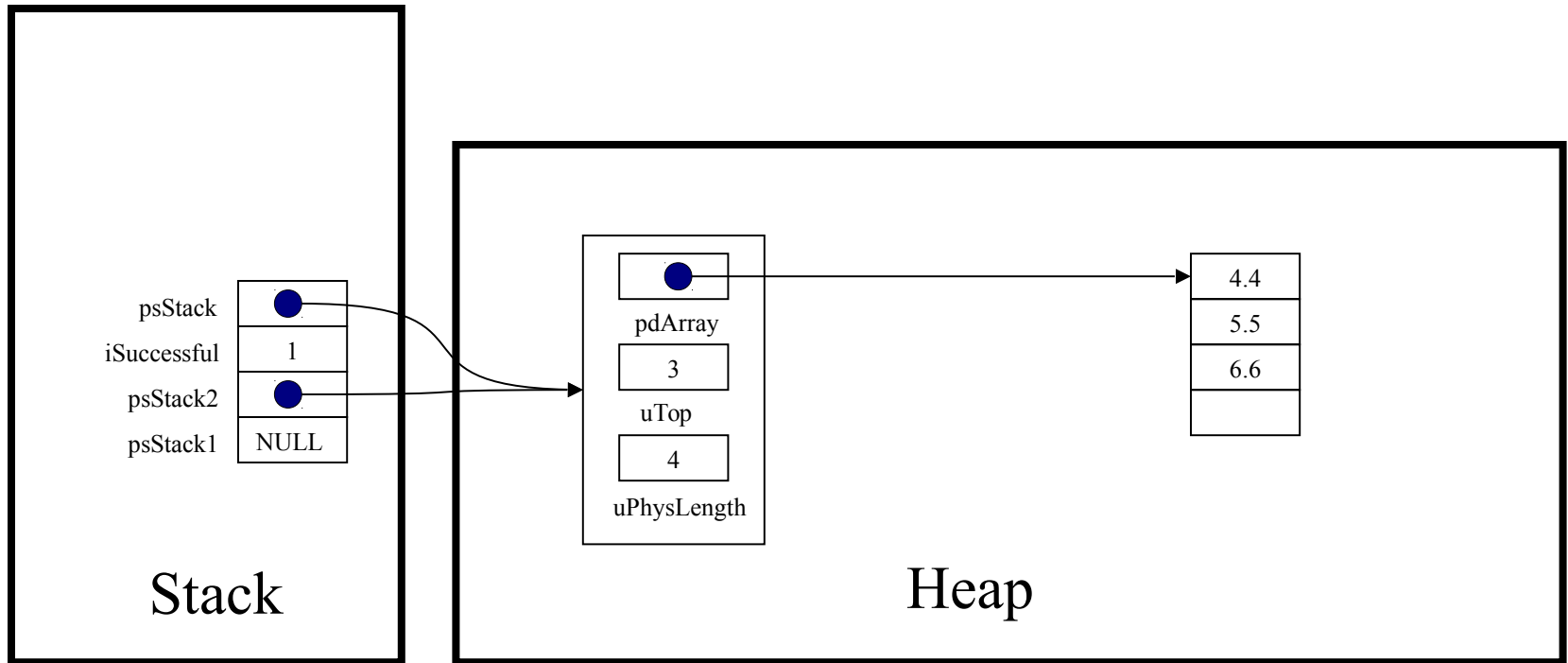
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



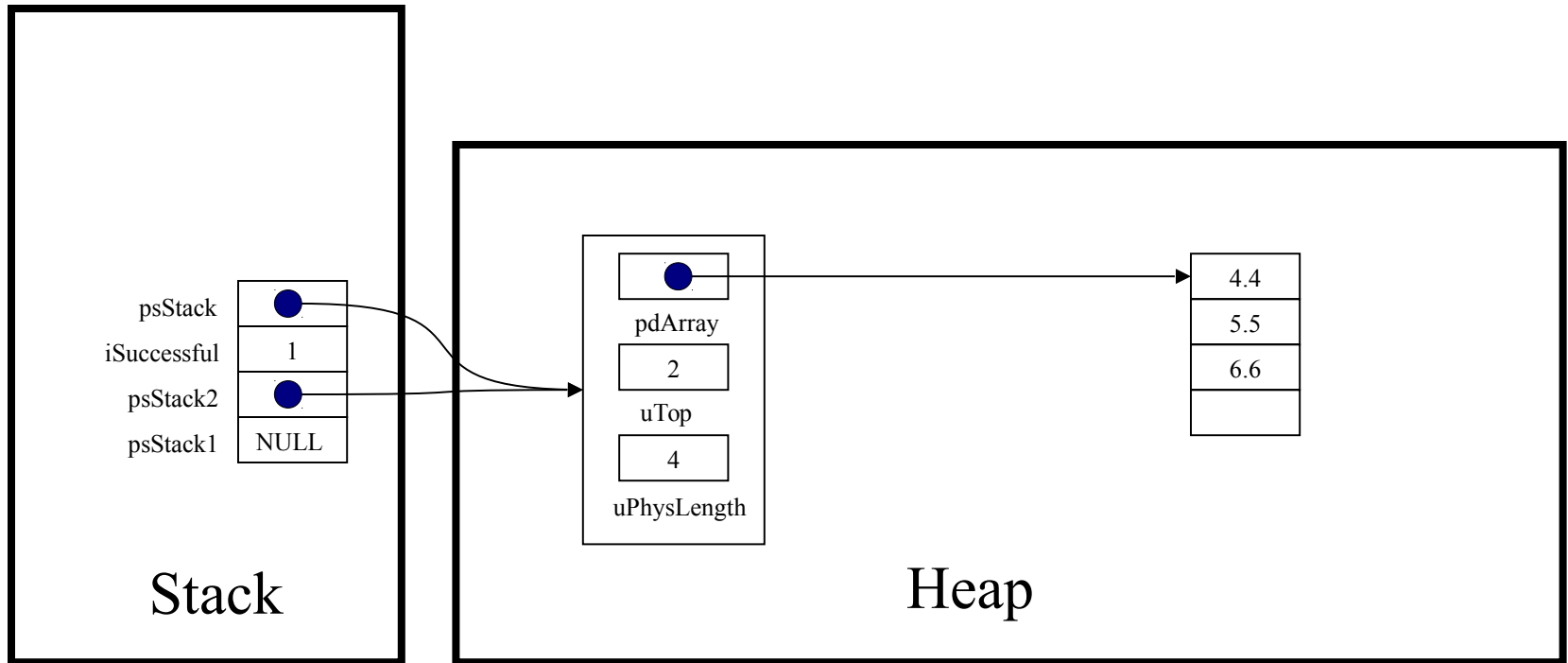
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Trace of teststack (Version 1)

```
assert (psStack->uTop > 0);
```



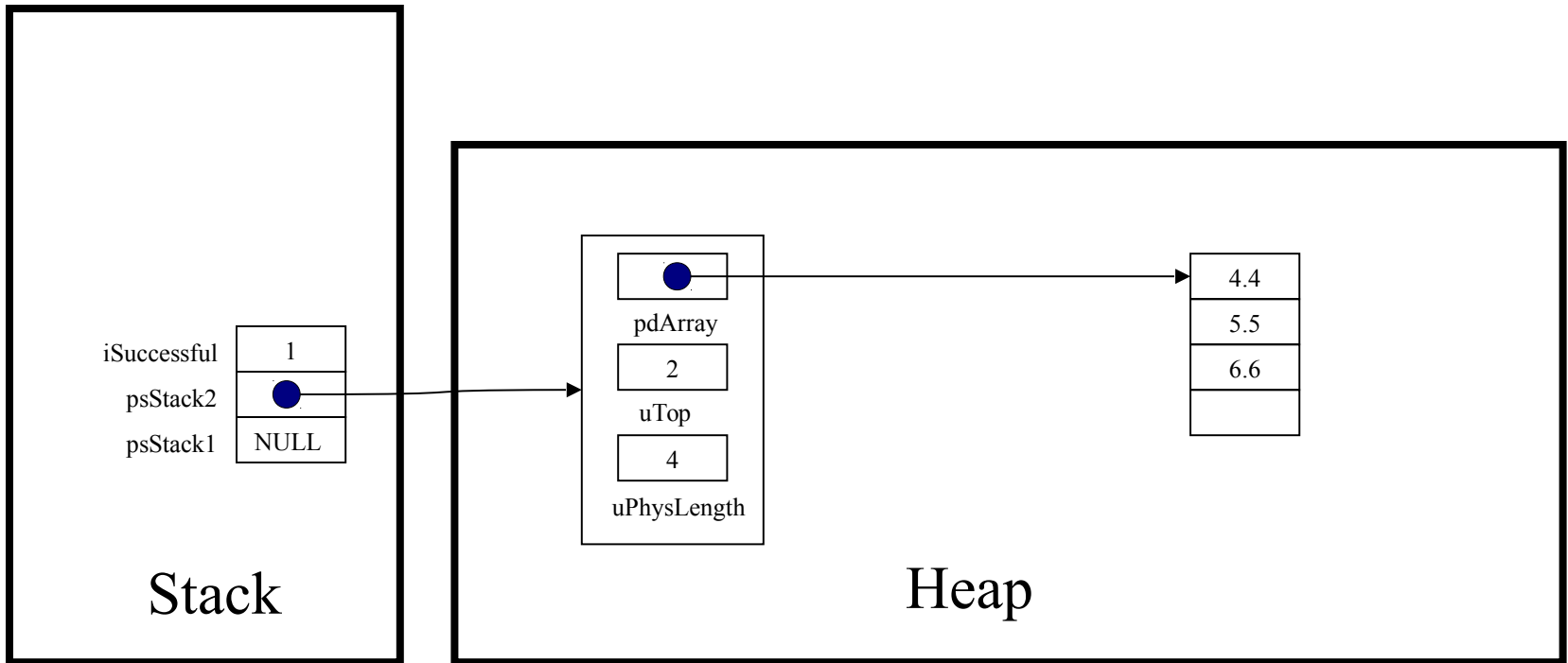
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Trace of teststack (Version 1)

```
(psStack->uTop) --;
```



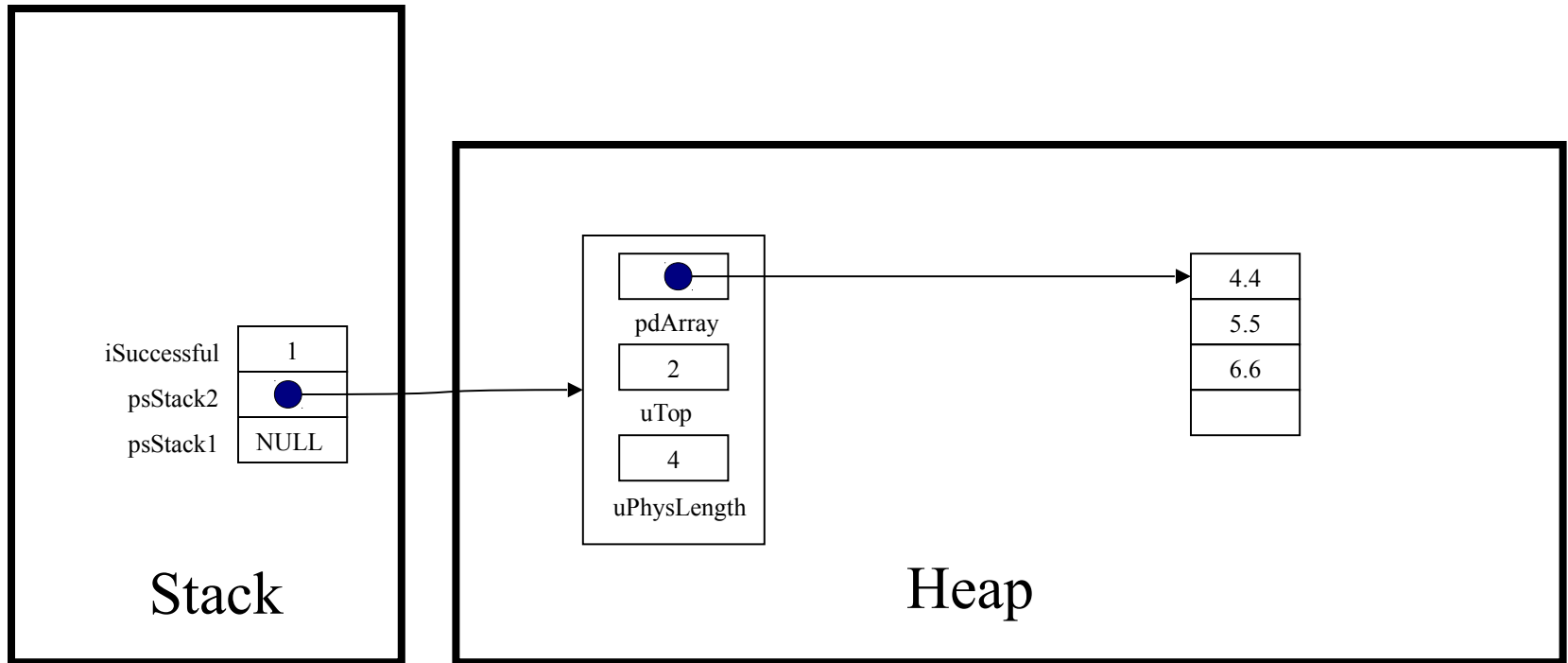
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Trace of teststack (Version 1)

```
return (psStack->pdArray)[psStack->uTop];
```



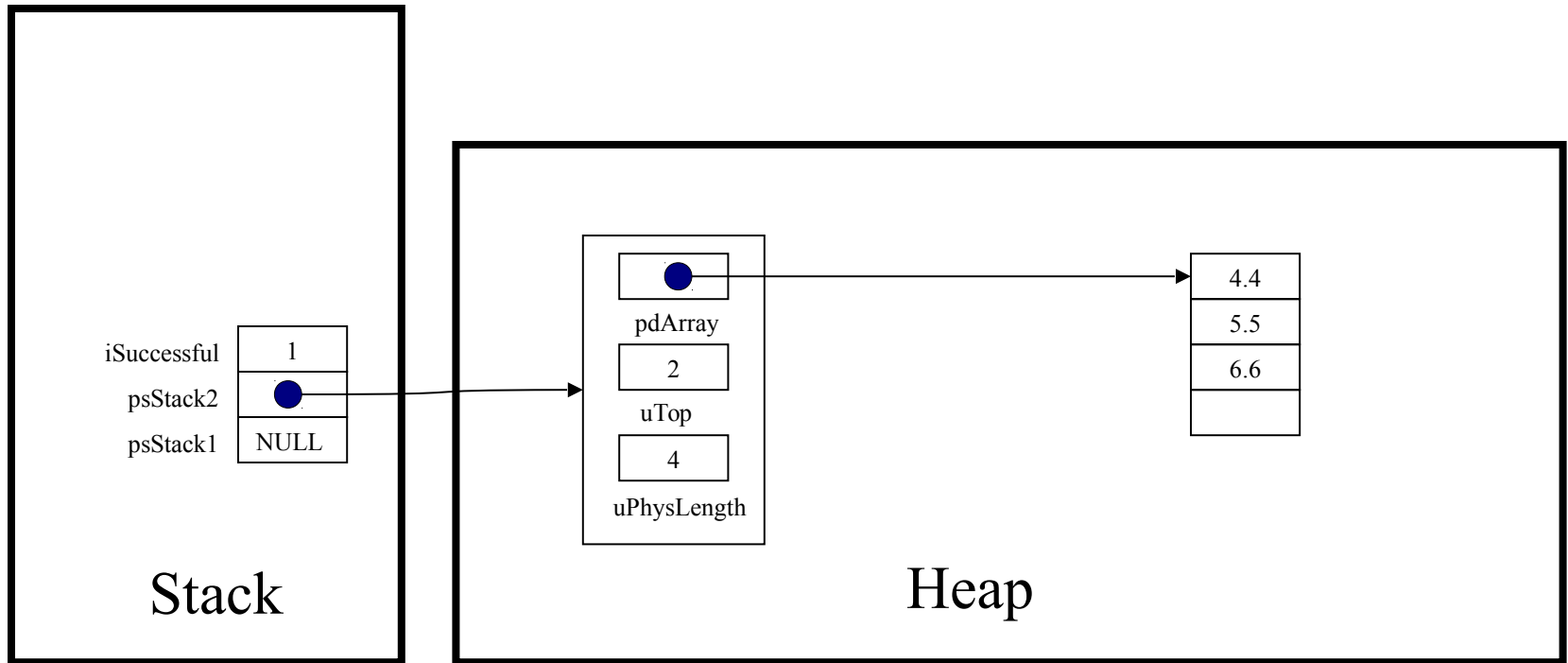
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Trace of teststack (Version 1)

```
printf("%g\n", Stack_pop(psStack2));
```



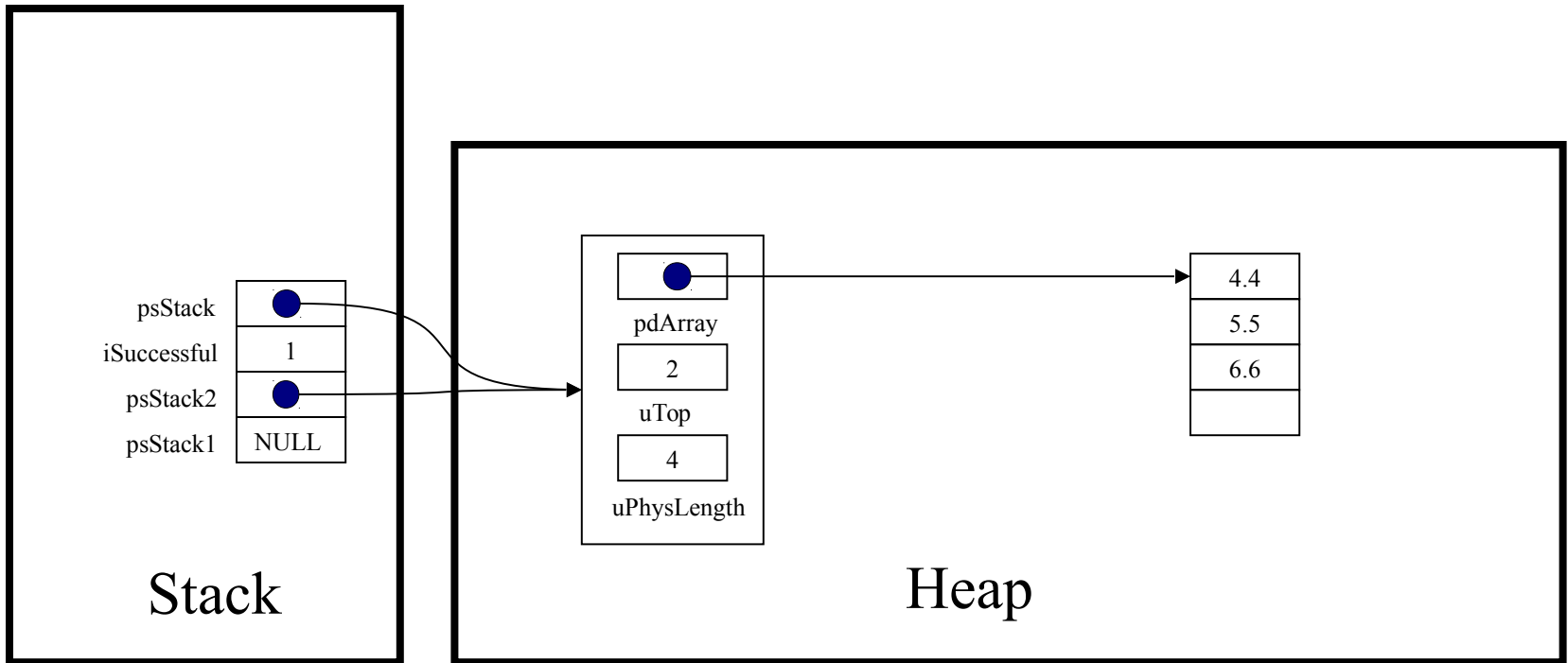
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack2))  
    ...
```



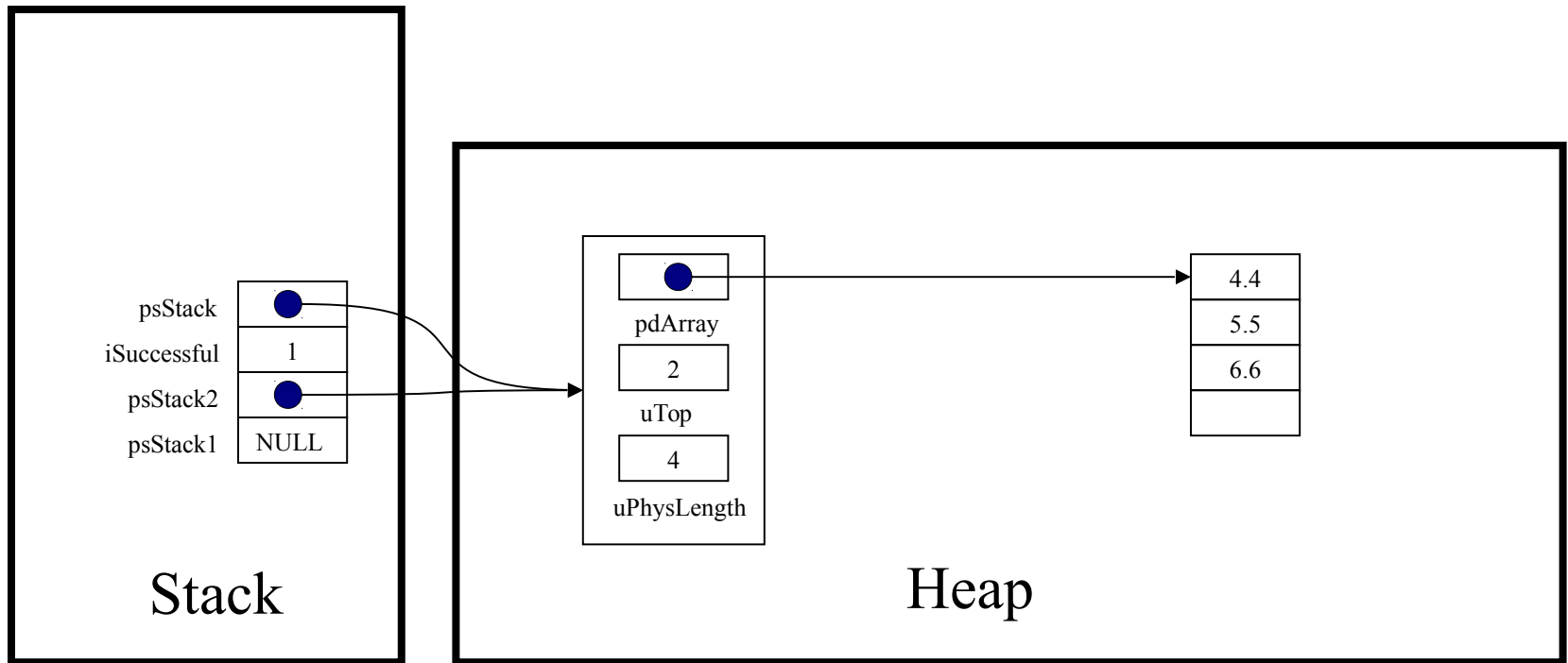
Princeton University
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Trace of teststack (Version 1)

```
int Stack_isEmpty(struct Stack *psStack)
```



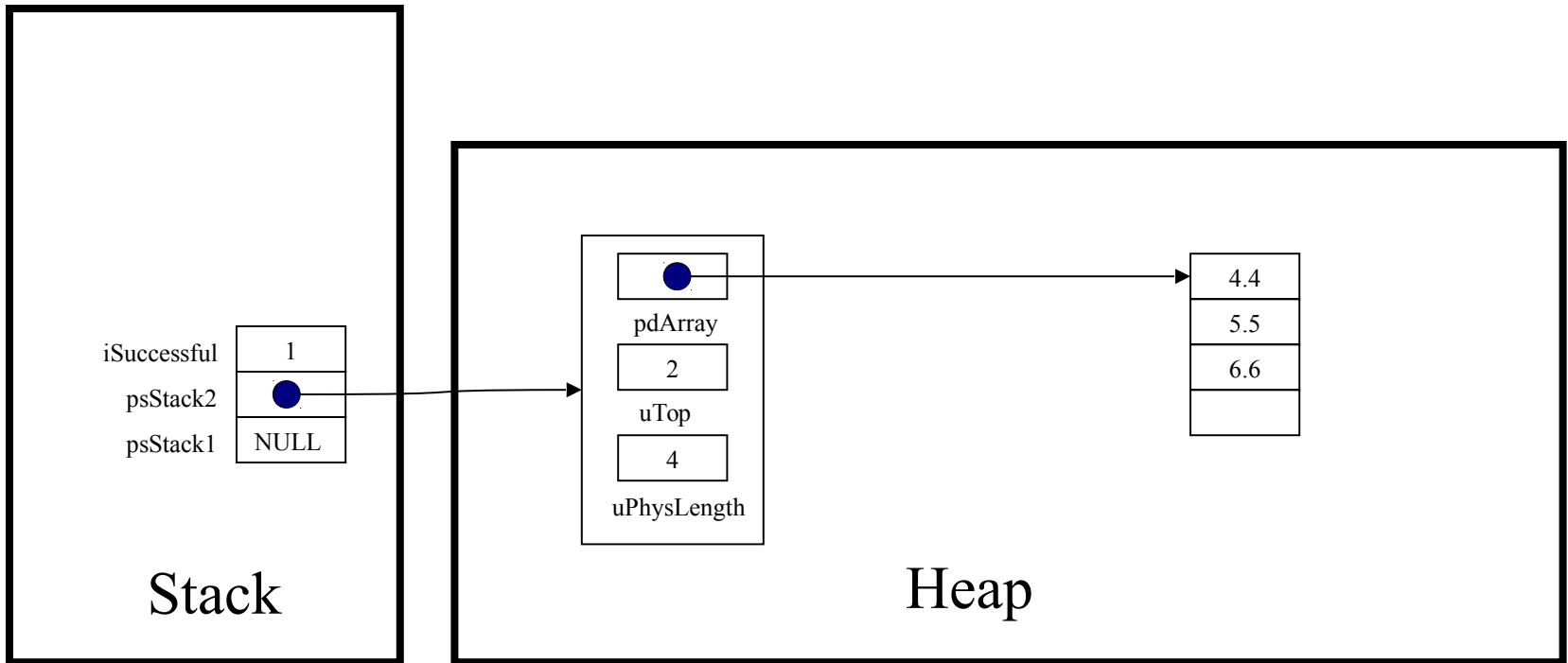
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



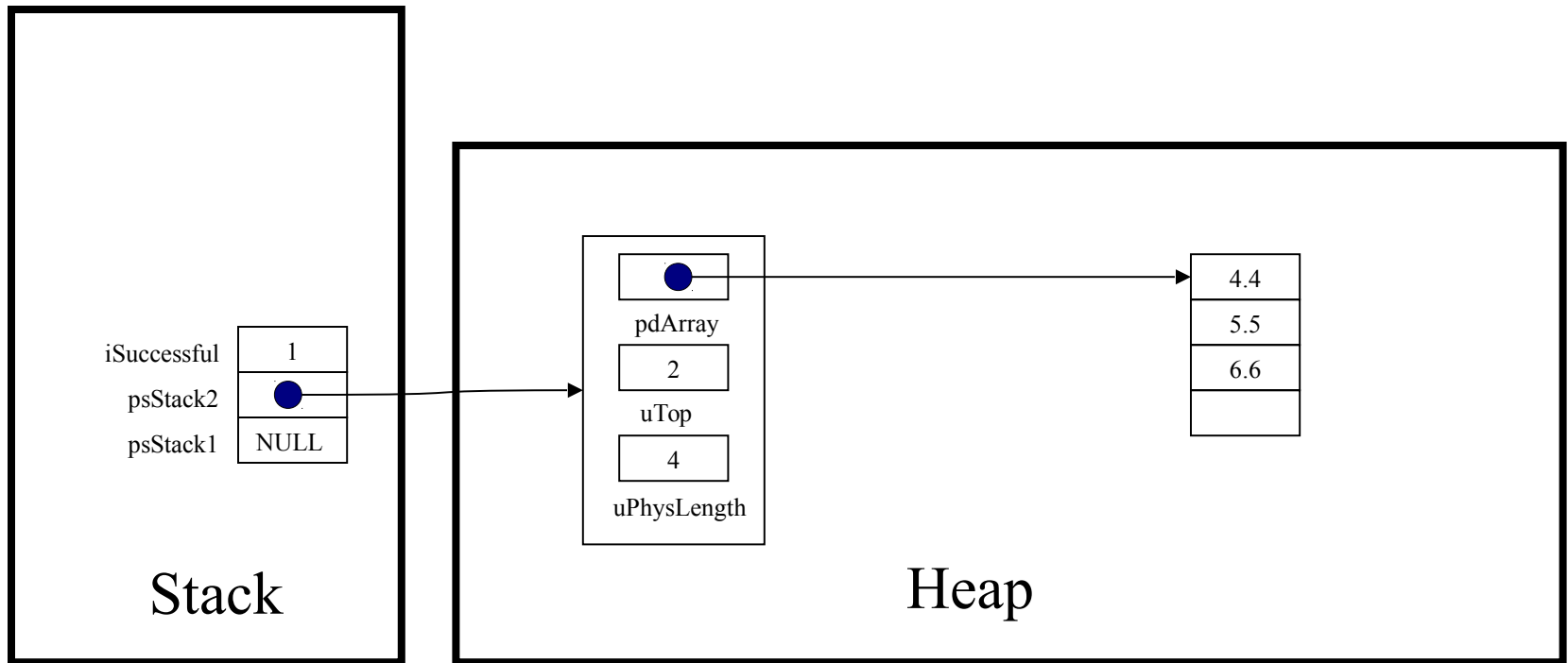
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Trace of teststack (Version 1)

```
return psStack->uTop == 0;
```



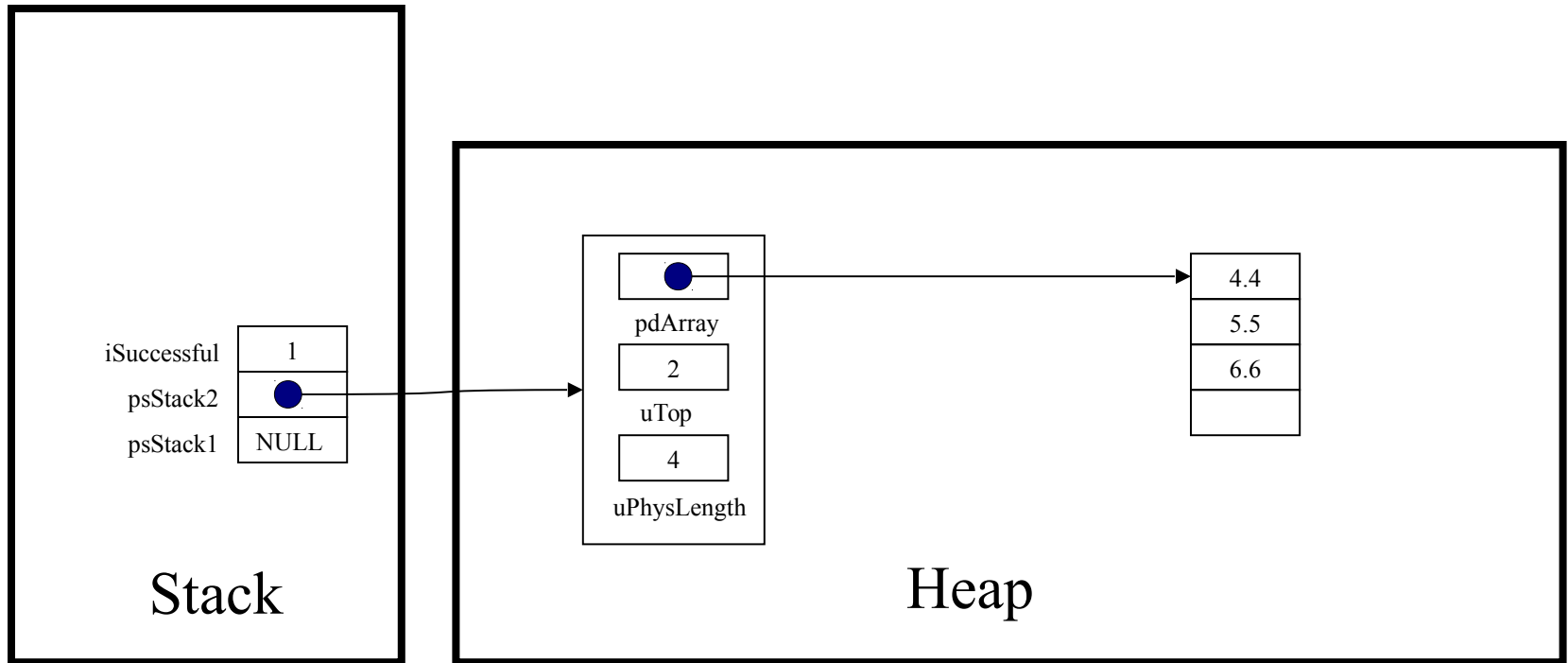
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack2))
```



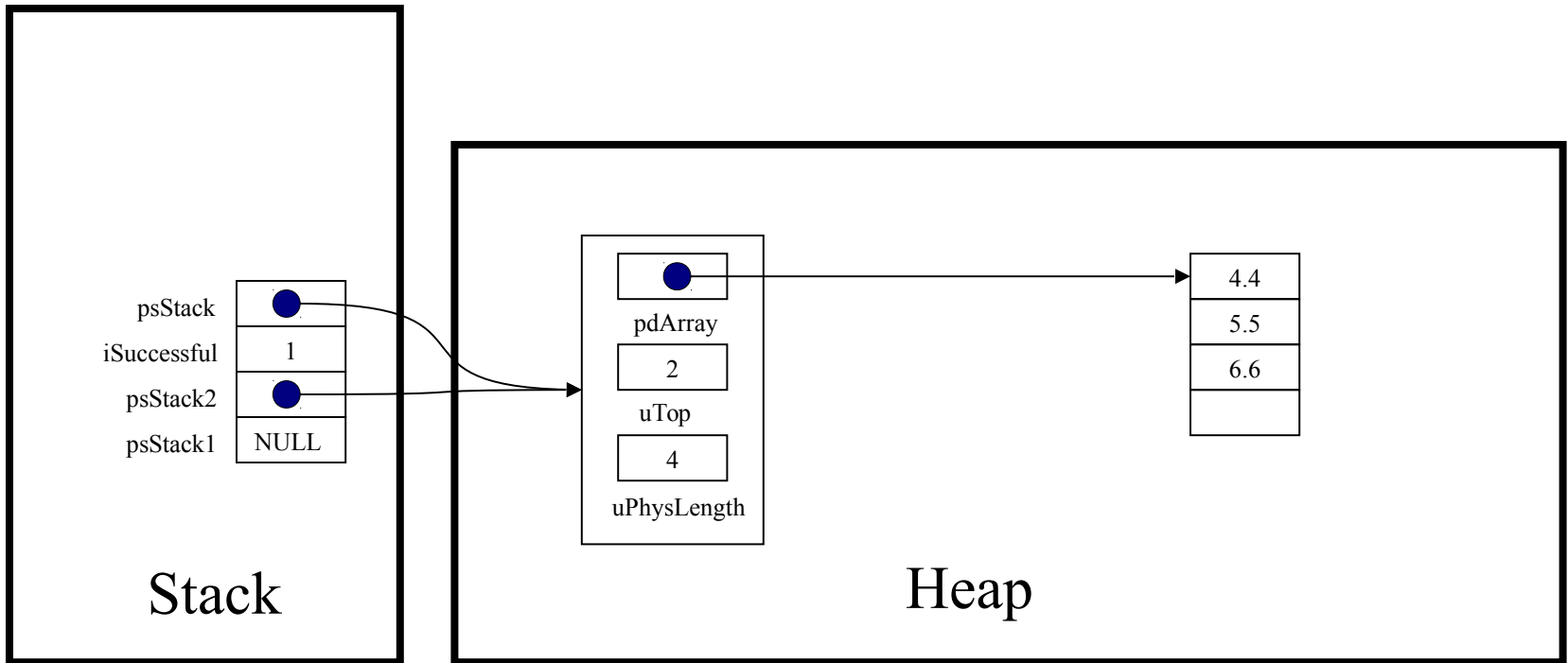
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Trace of teststack (Version 1)

```
printf("%g\n", Stack_pop(psStack2));
```



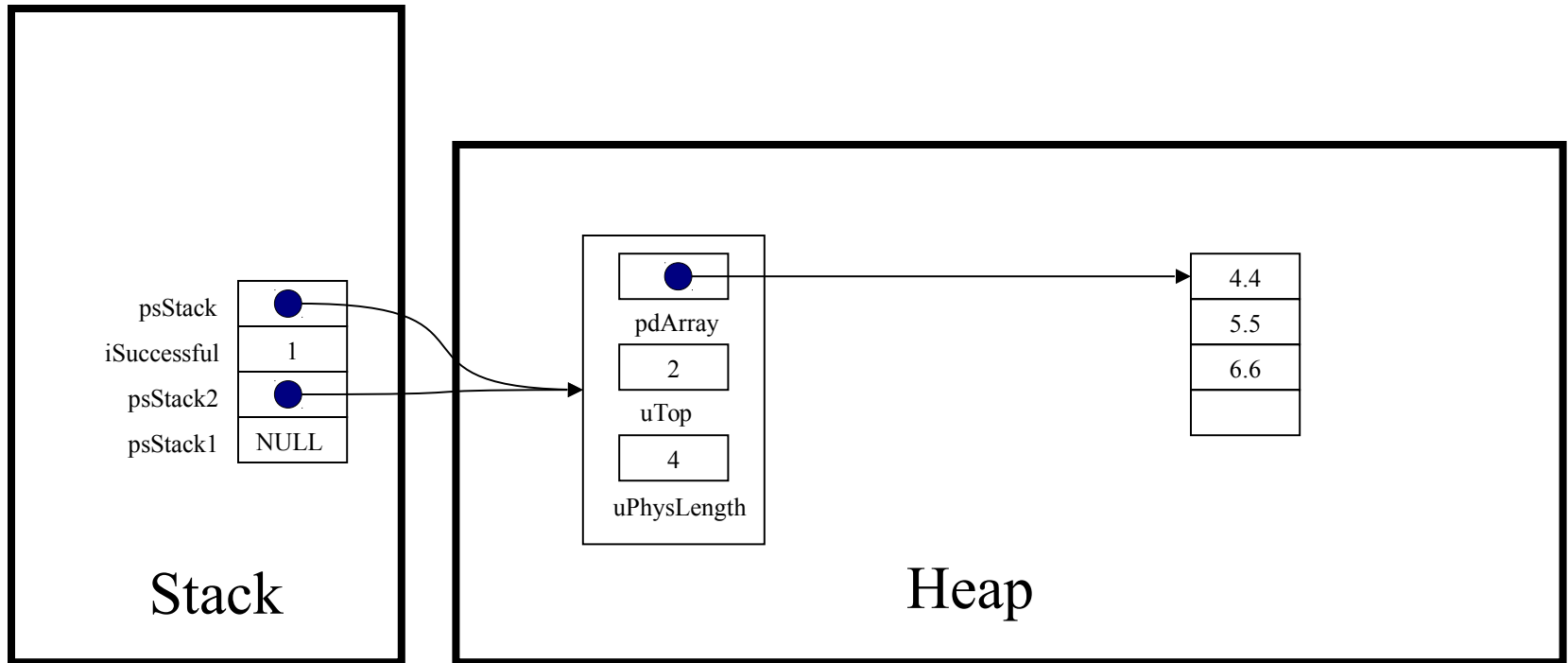
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Trace of teststack (Version 1)

```
double Stack_pop(struct Stack *psStack)
```



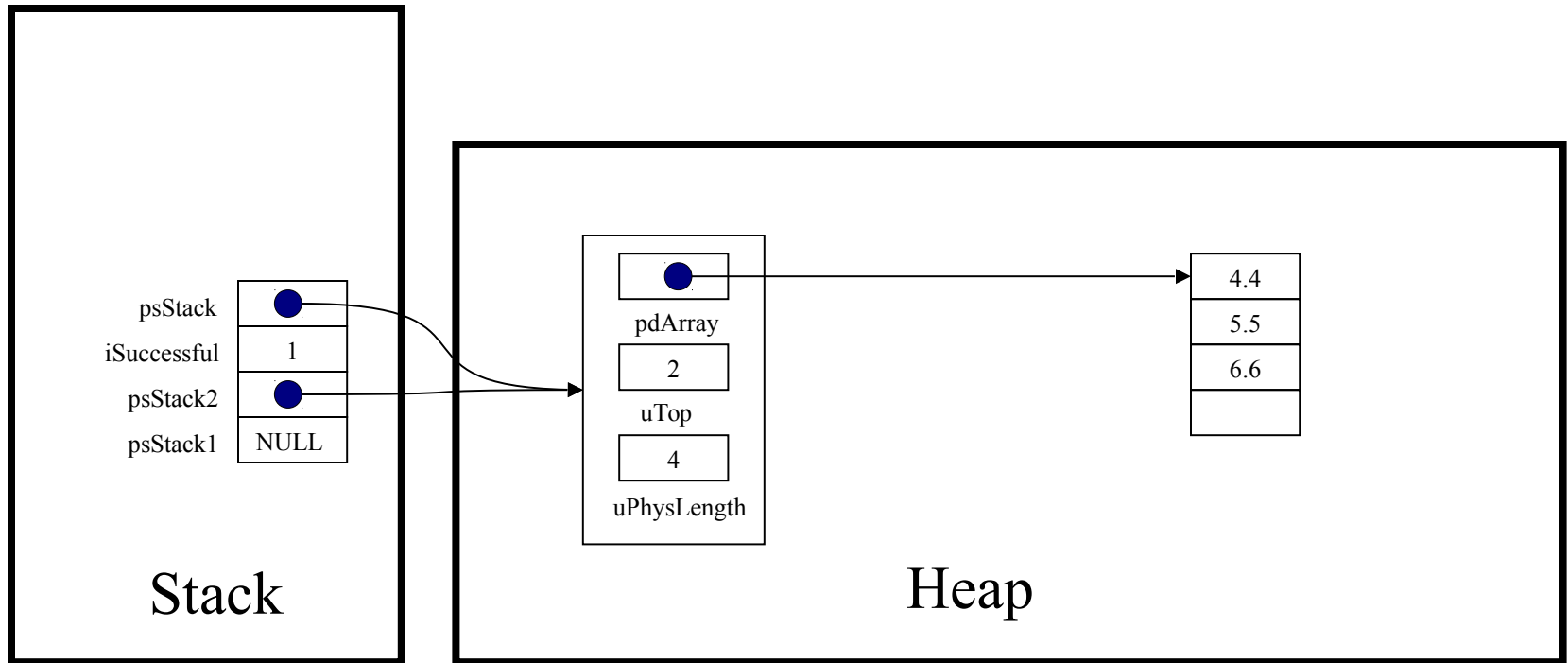
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



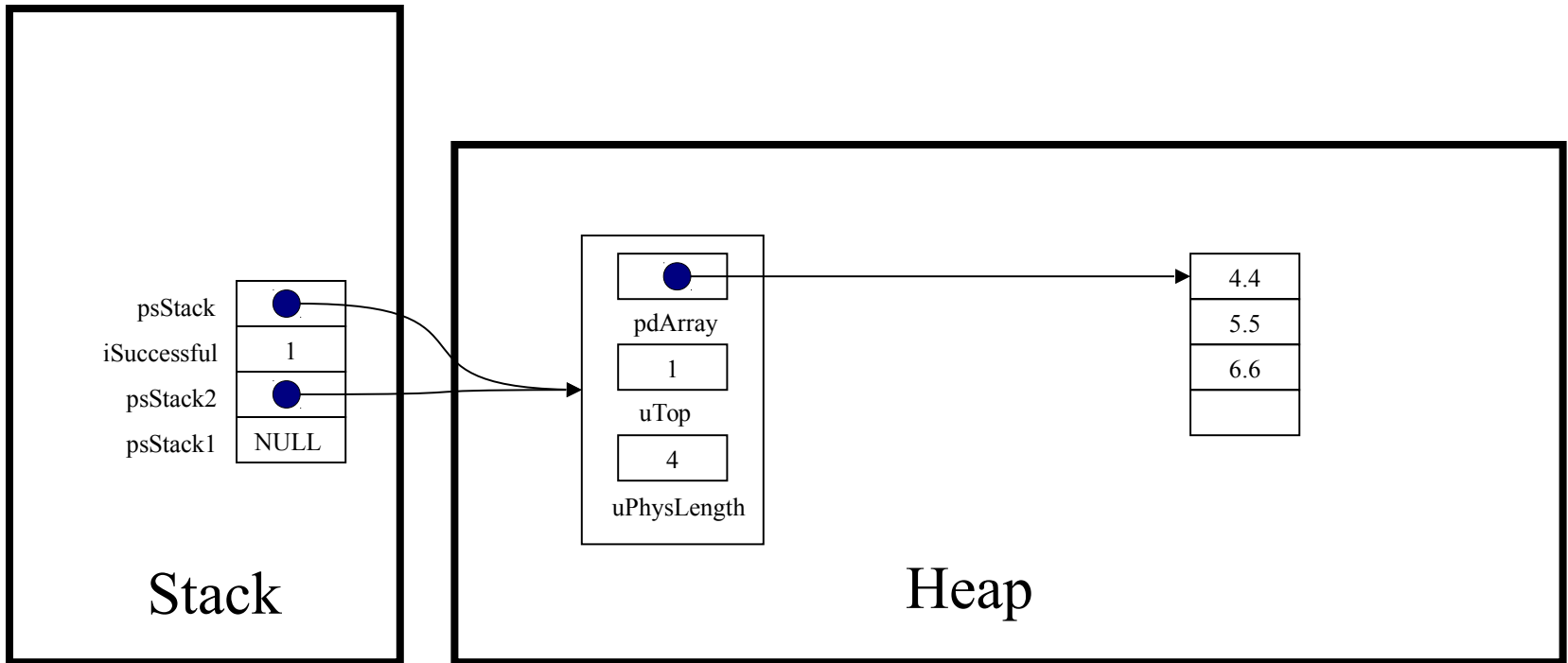
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Trace of teststack (Version 1)

```
assert (psStack->uTop > 0);
```



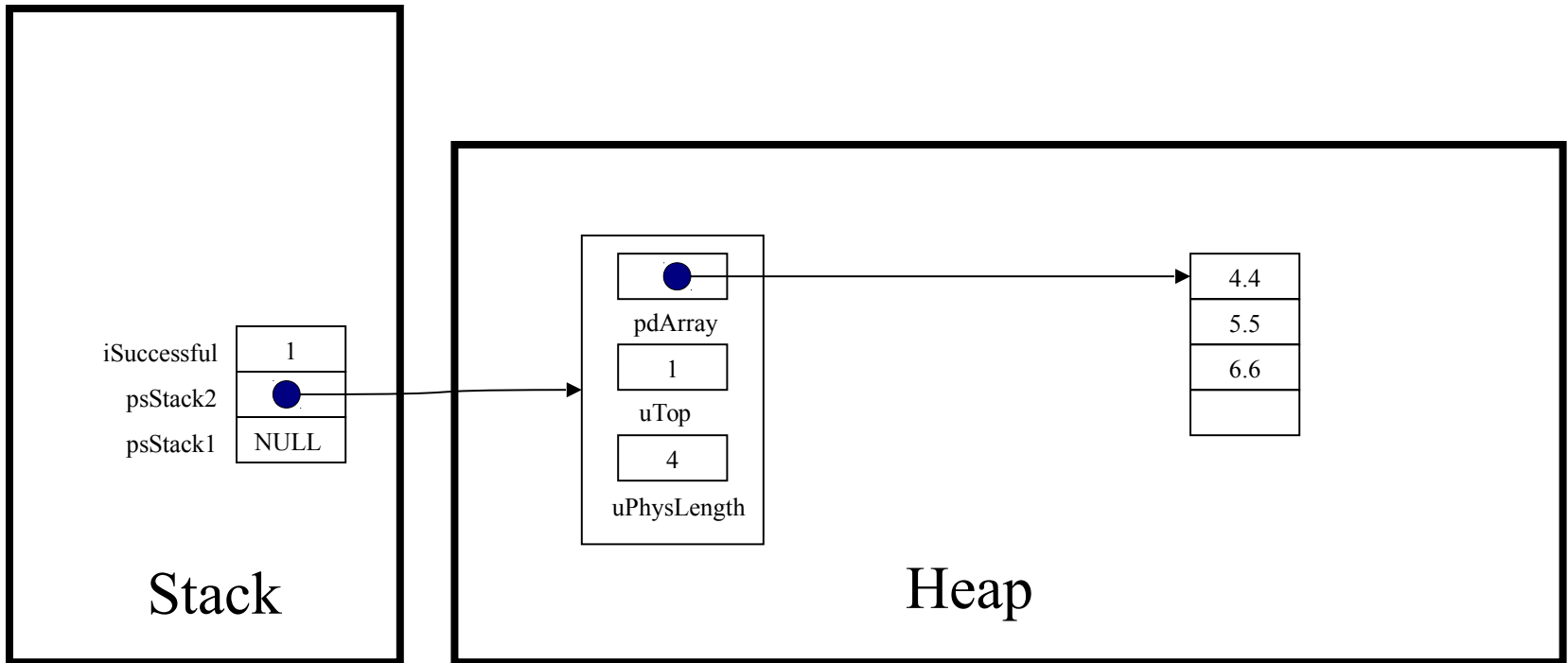
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Trace of teststack (Version 1)

```
(psStack->uTop) --;
```



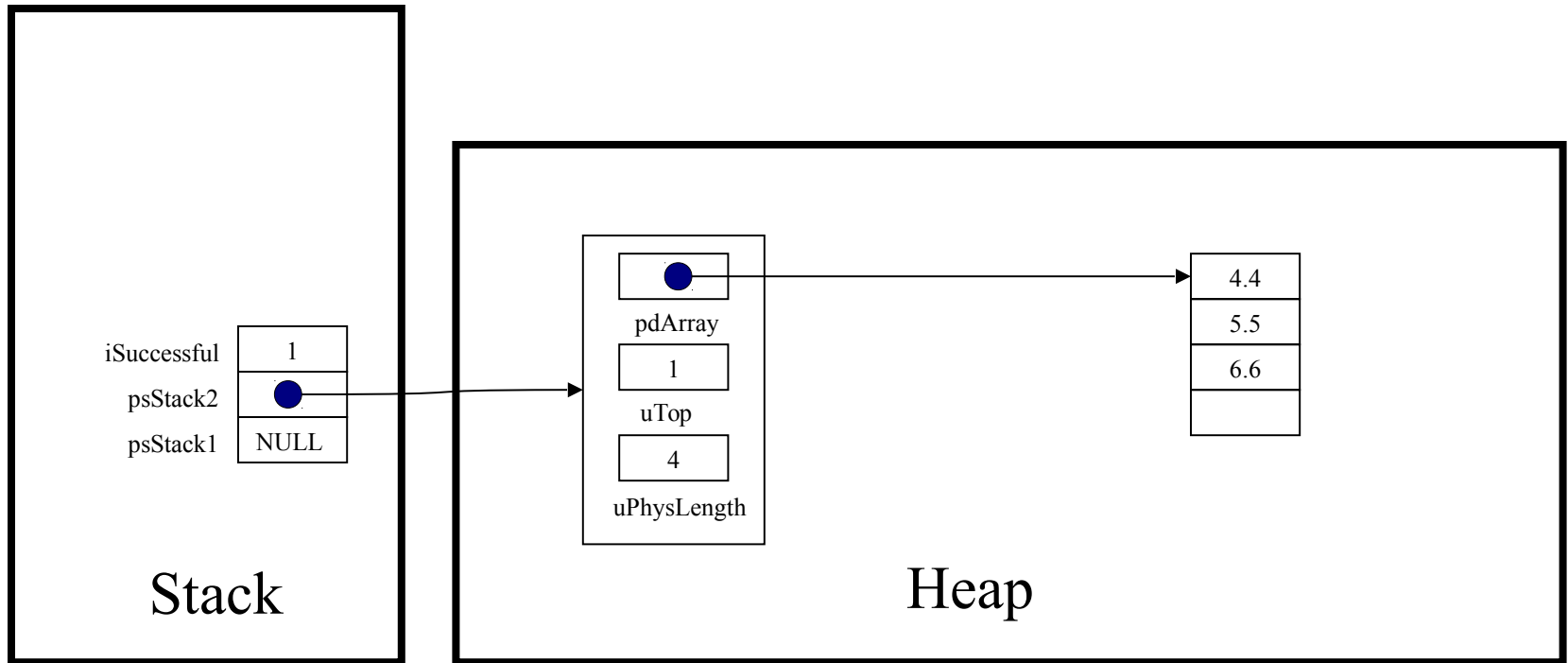
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Trace of teststack (Version 1)

```
return (psStack->pdArray)[psStack->uTop];
```



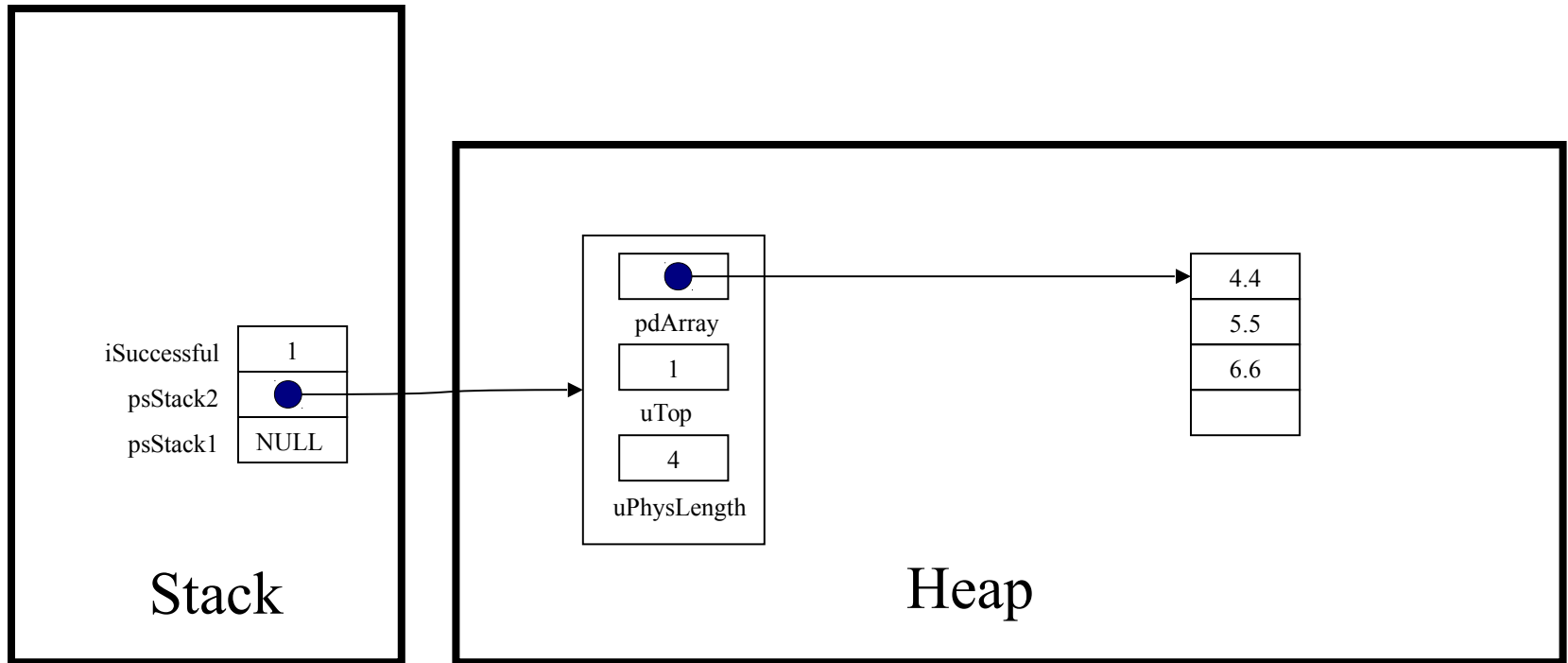
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Trace of teststack (Version 1)

```
printf("%g\n", Stack_pop(psStack2));
```



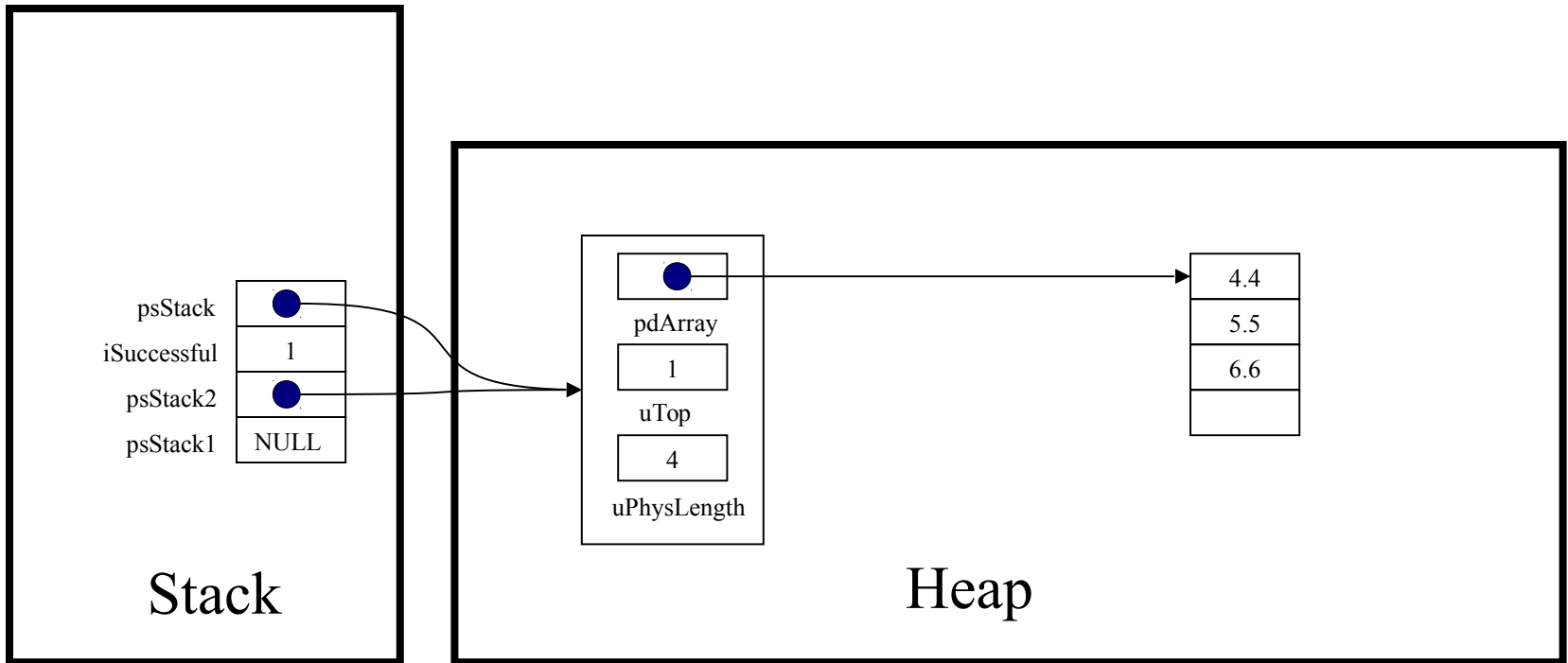
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack2))  
    ...
```



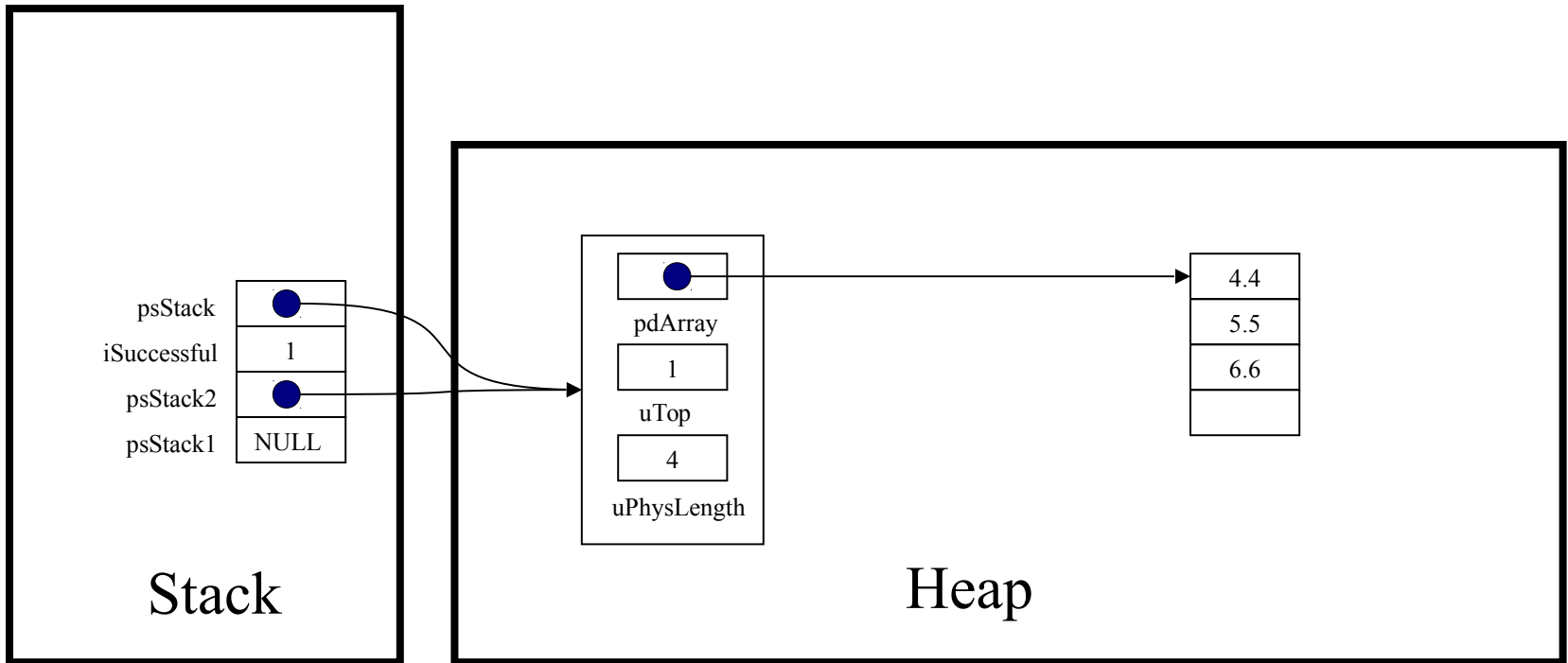
Princeton University
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Trace of teststack (Version 1)

```
int Stack_isEmpty(struct Stack *psStack)
```



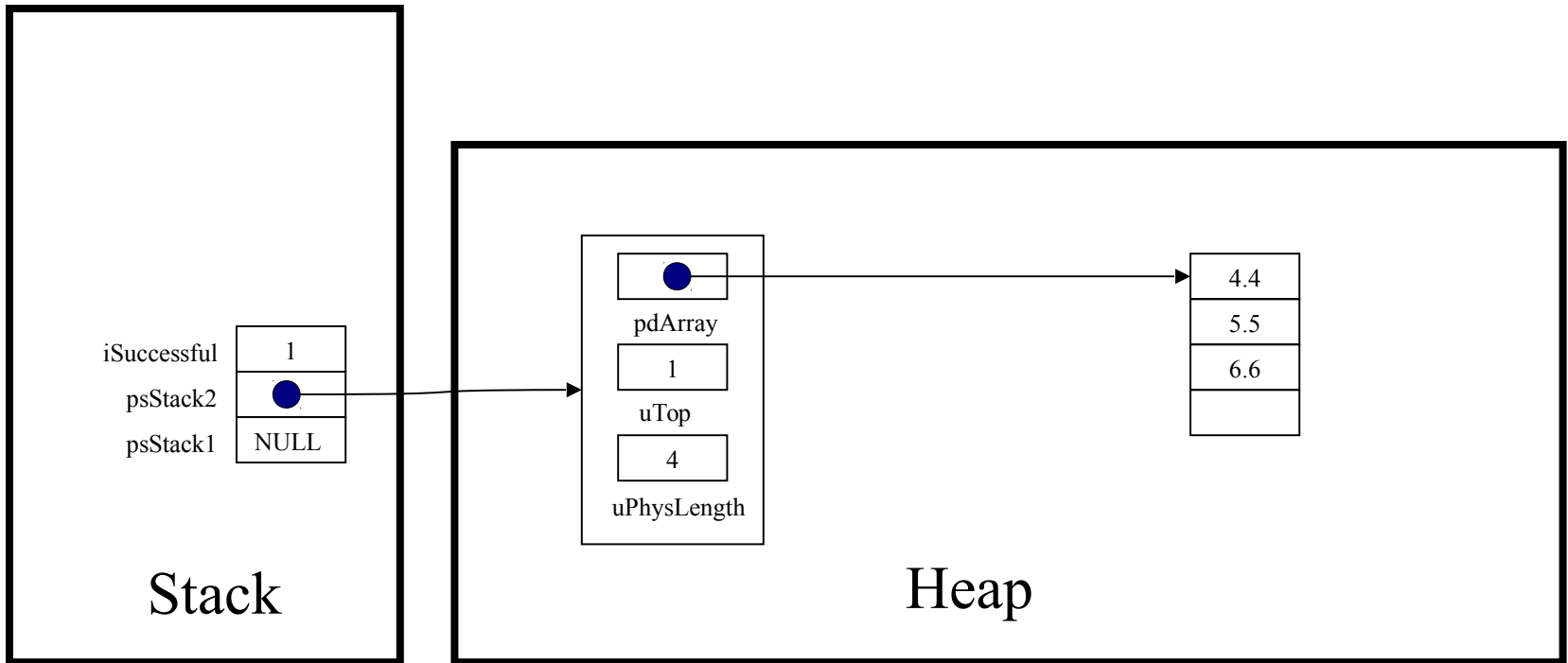
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Trace of teststack (Version 1)

```
assert (psStack != NULL);
```



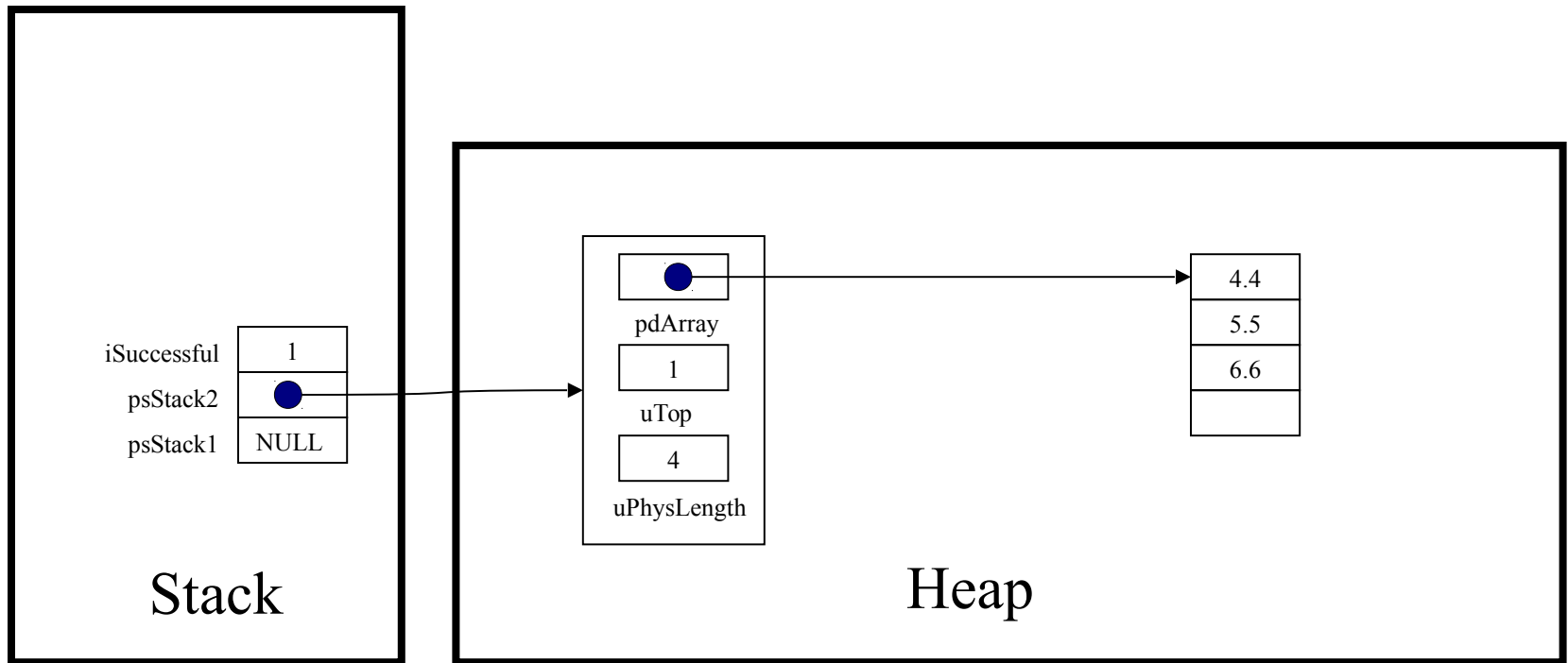
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Trace of teststack (Version 1)

```
return psStack->uTop == 0;
```



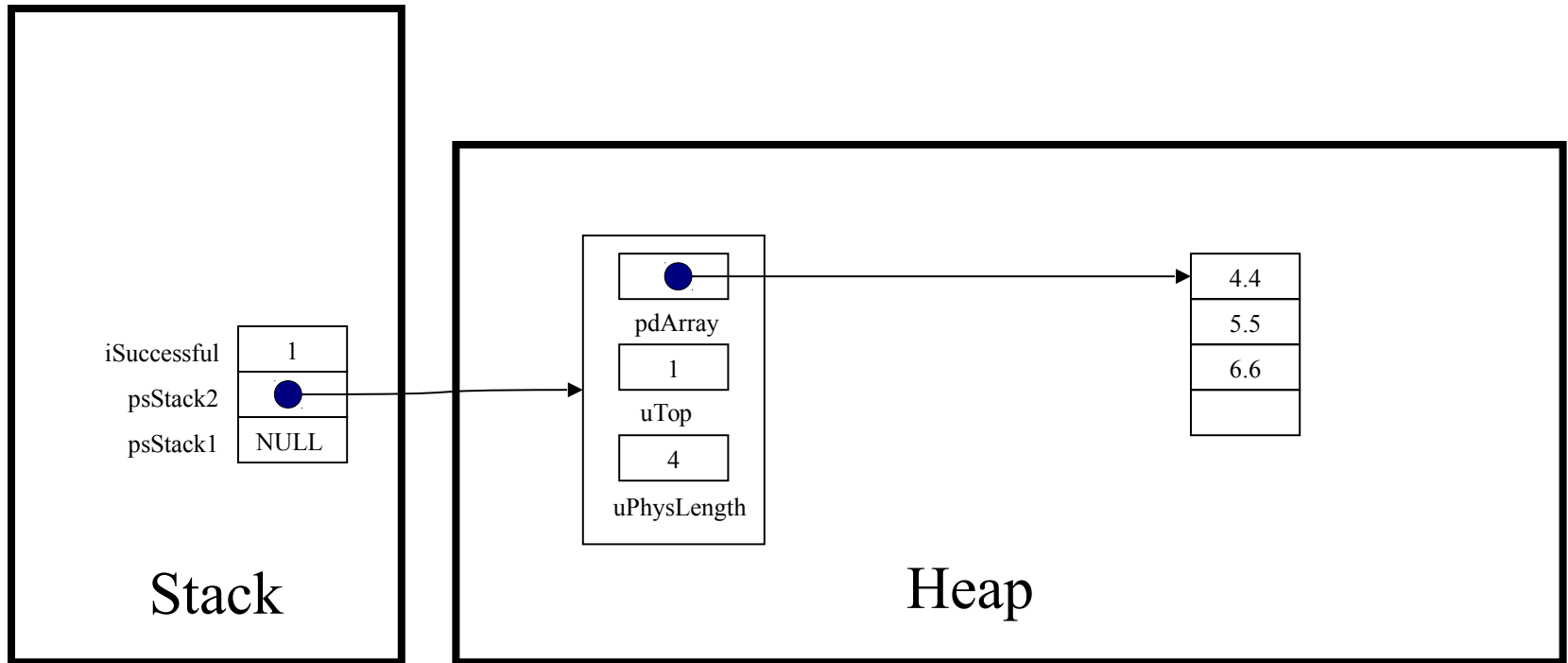
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Trace of teststack (Version 1)

```
while (! Stack_isEmpty(psStack2))
```



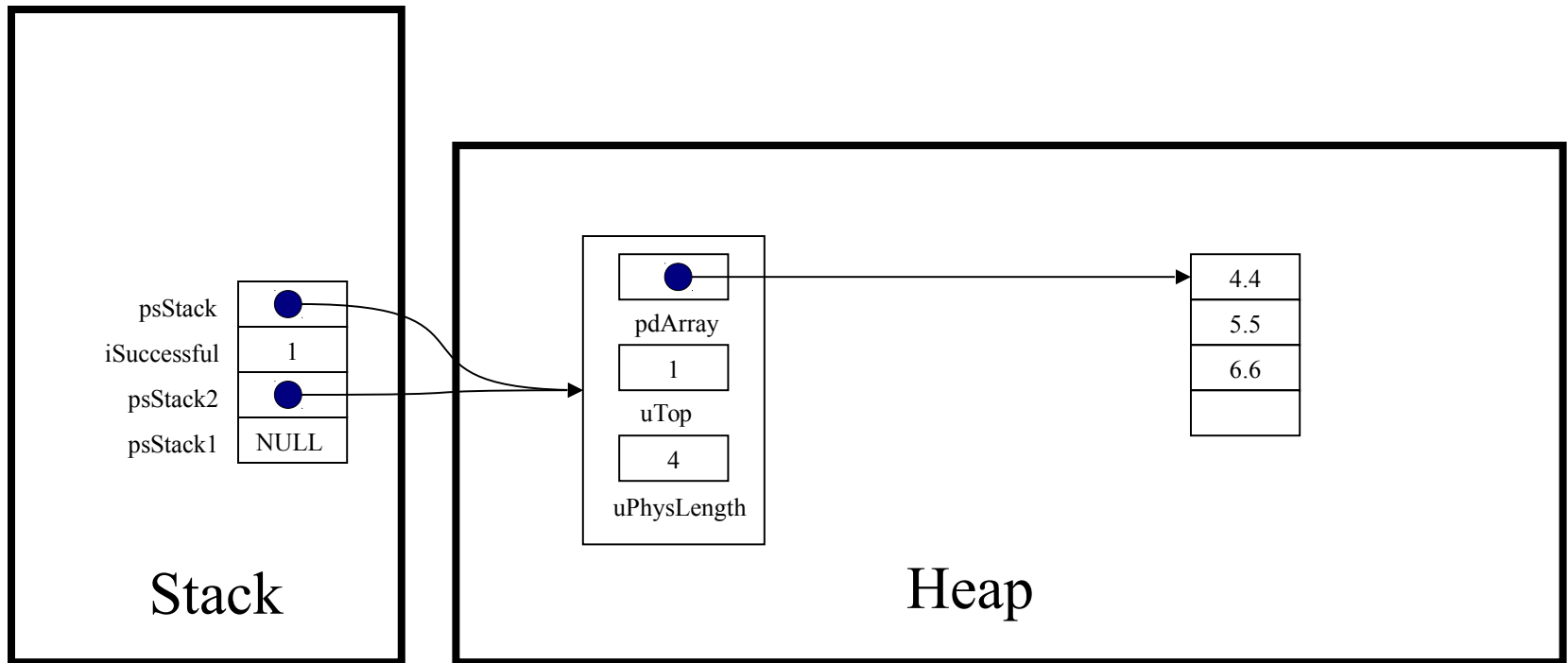
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```
printf("%g\n", Stack_pop(psStack2));
```



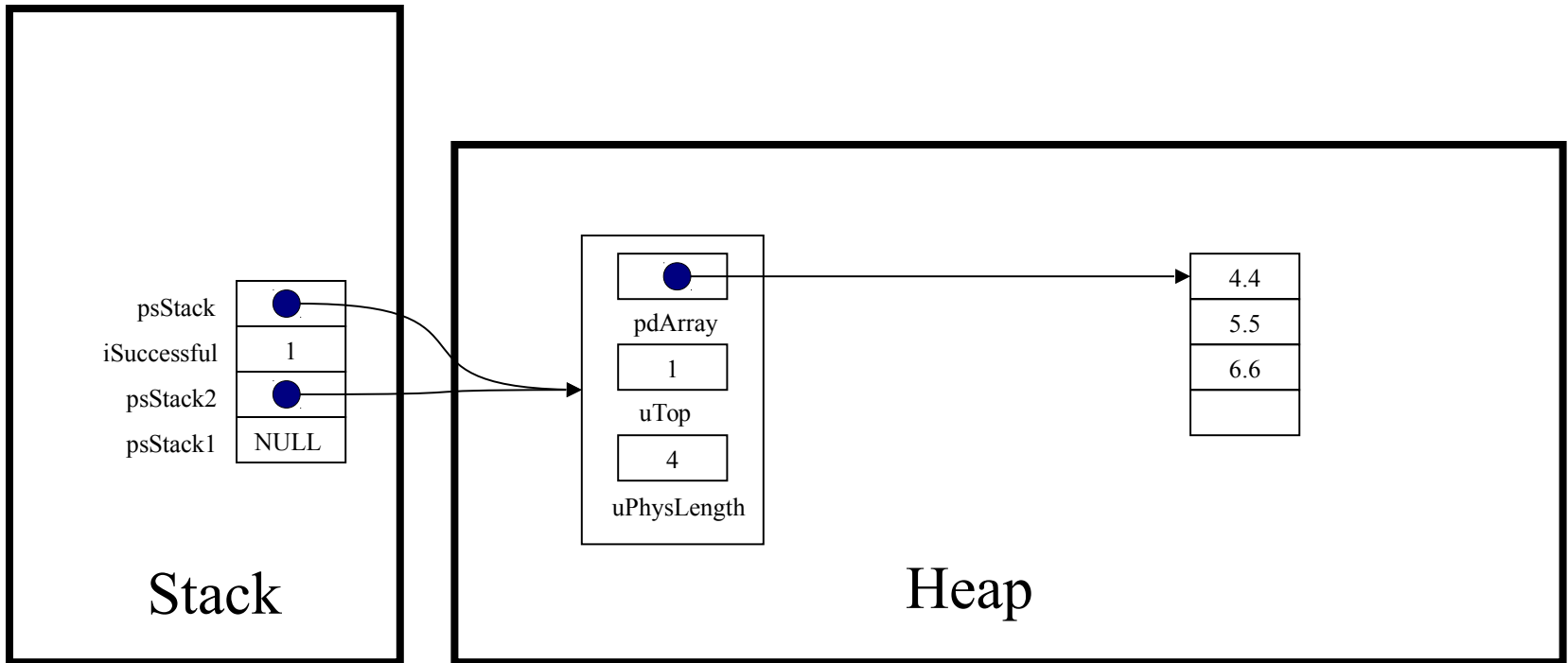
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```
double Stack_pop(struct Stack *psStack)
```



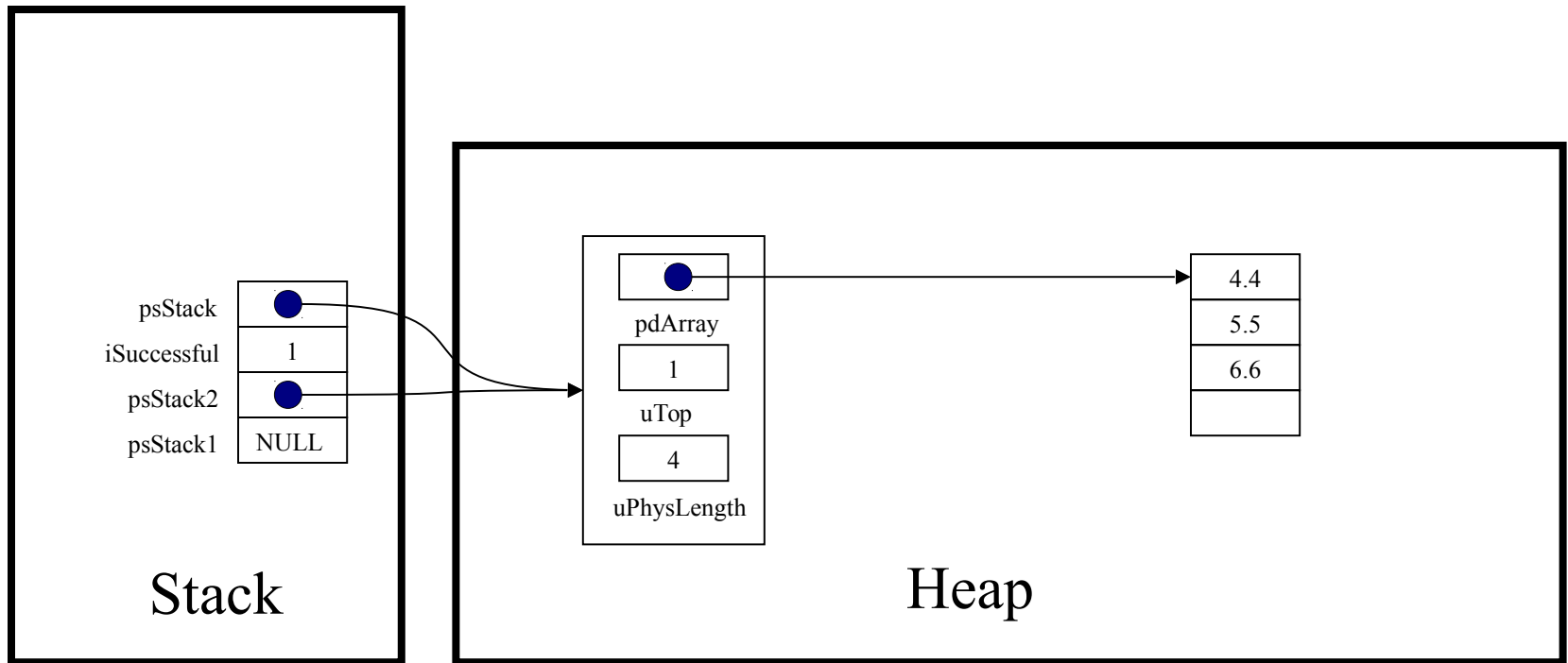
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```
assert (psStack != NULL);
```



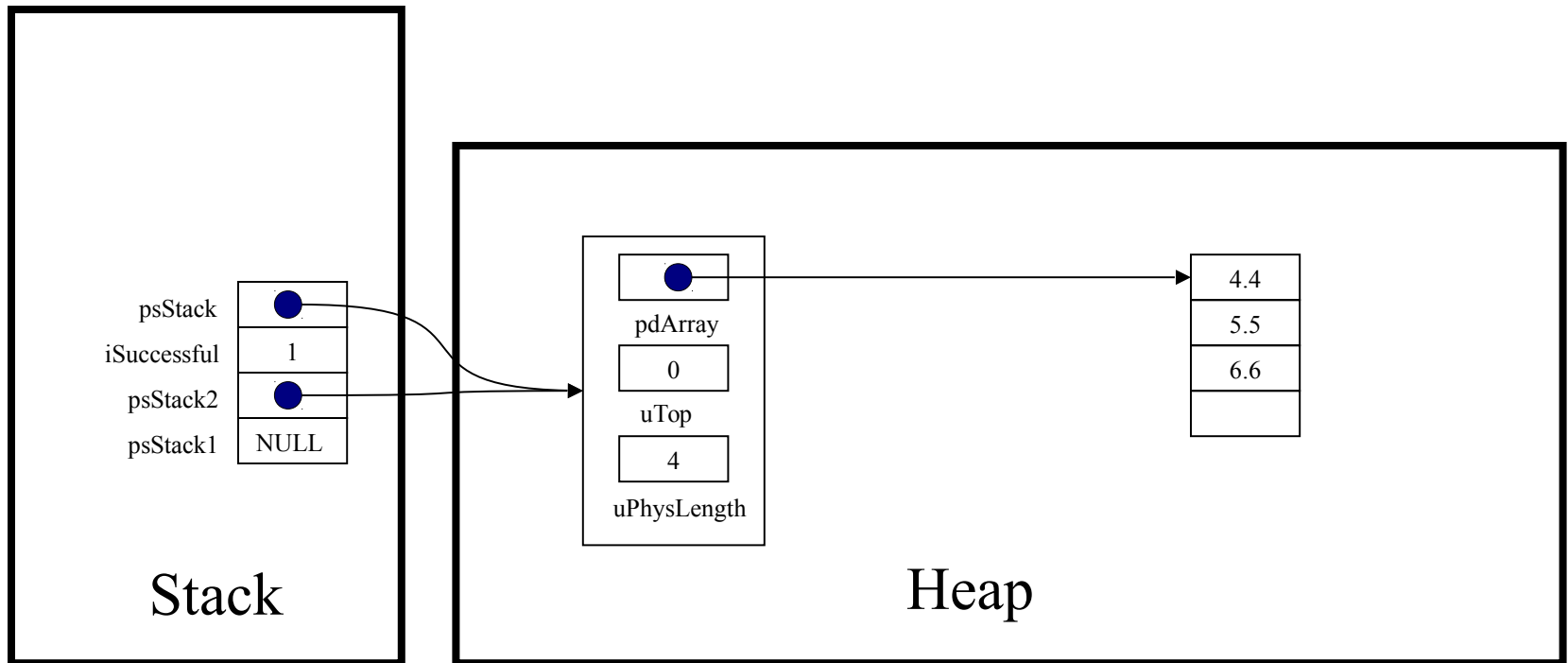
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```
assert (psStack->uTop > 0);
```



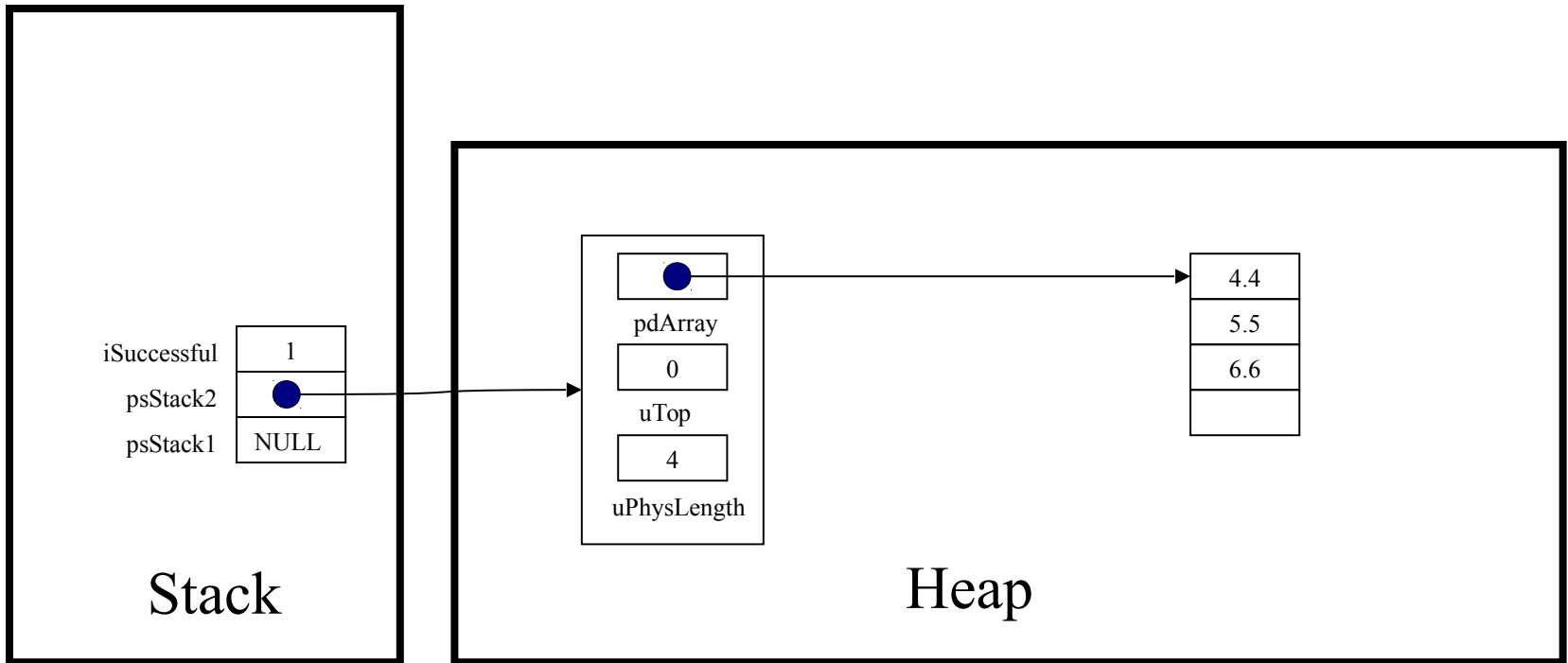
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```
(psStack->uTop) --;
```



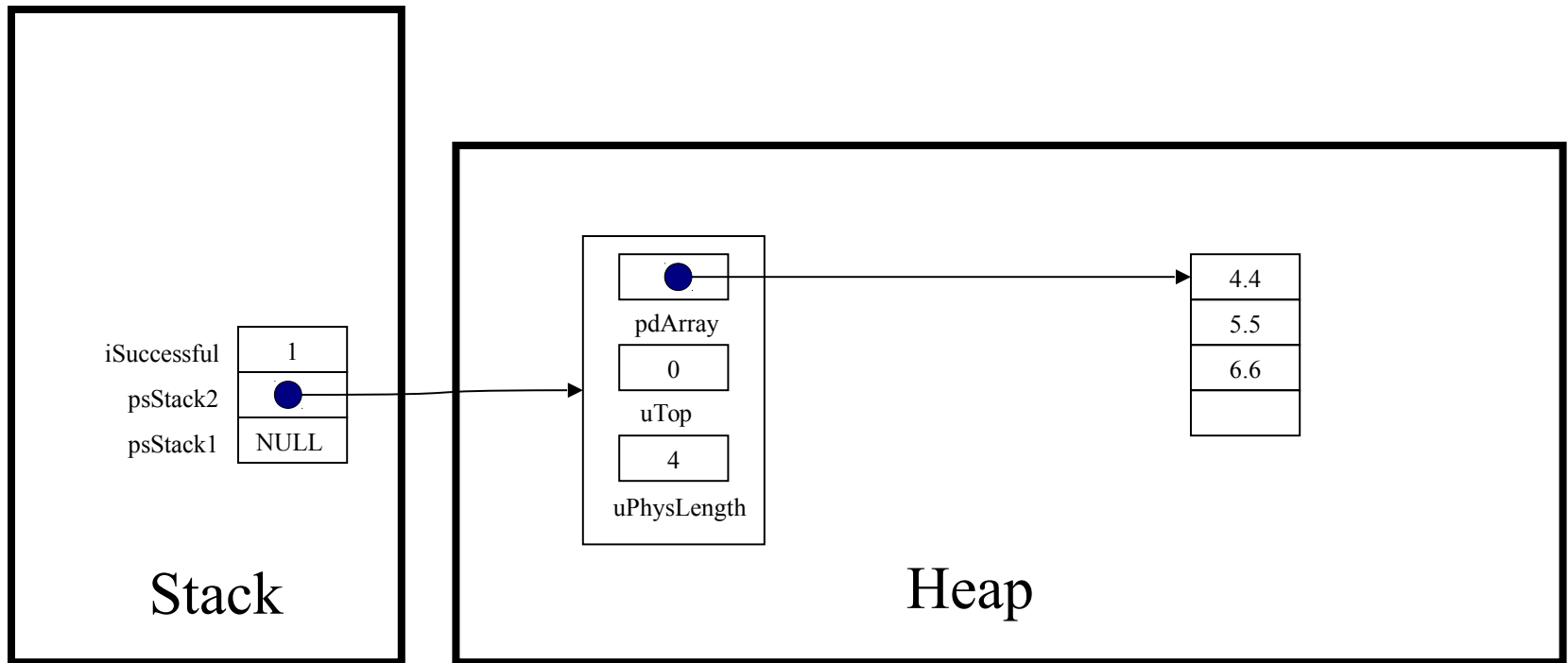
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```
return (psStack->pdArray)[psStack->uTop];
```



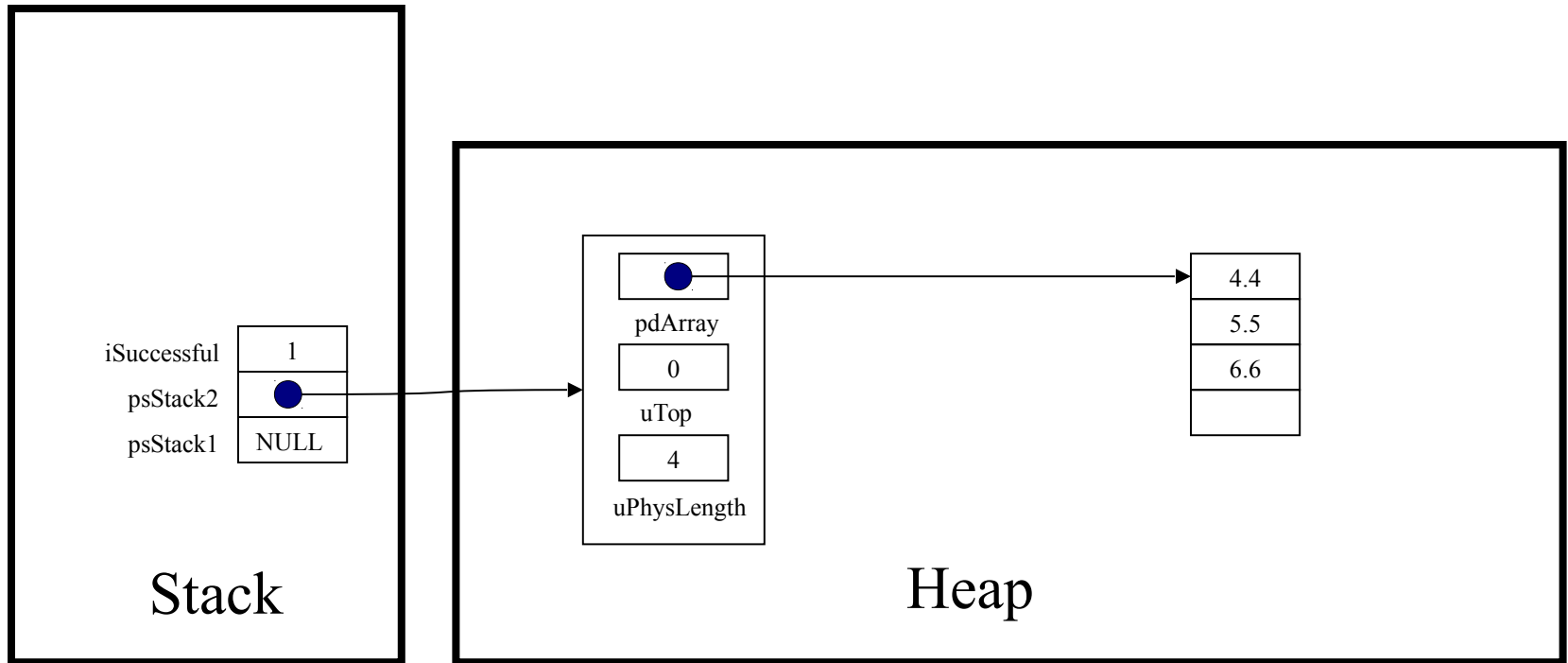
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```
printf("%g\n", Stack_pop(psStack2));
```



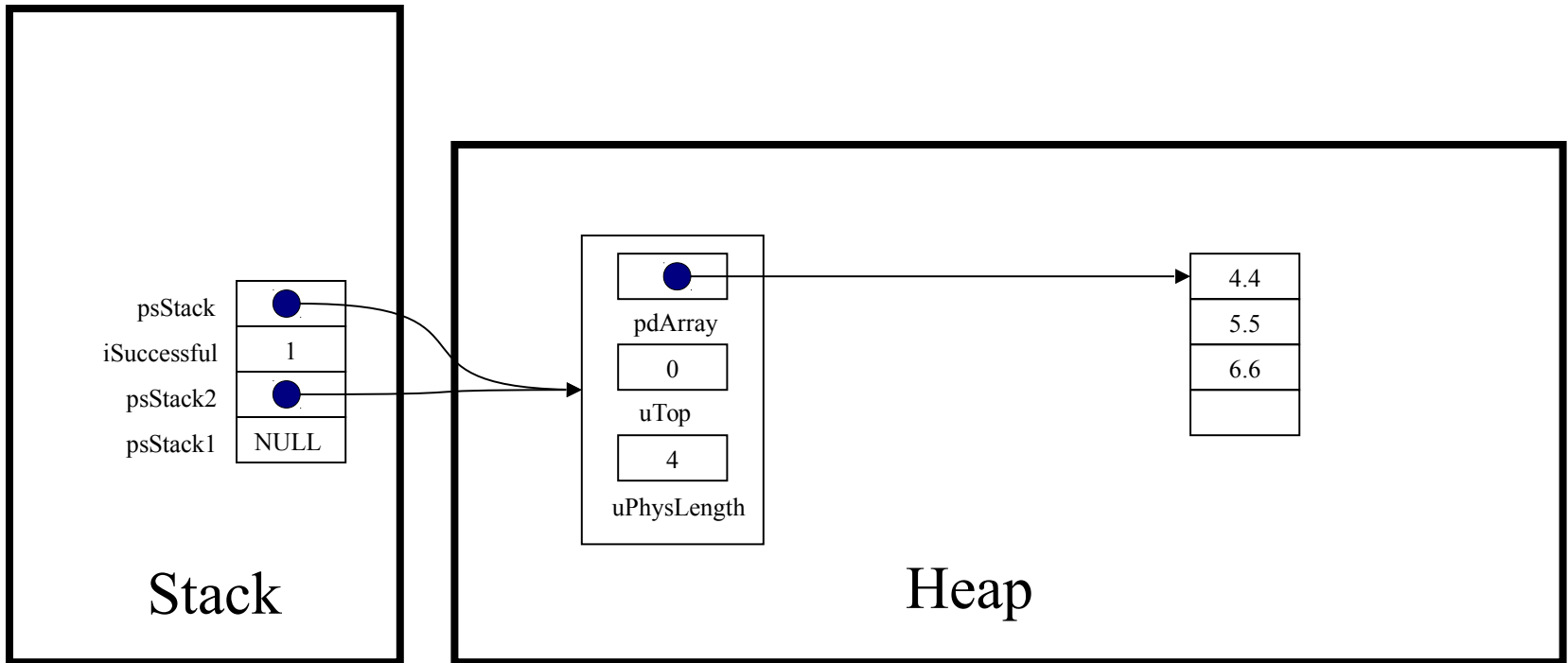
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```
while (! Stack_isEmpty(psStack2))  
    ...
```



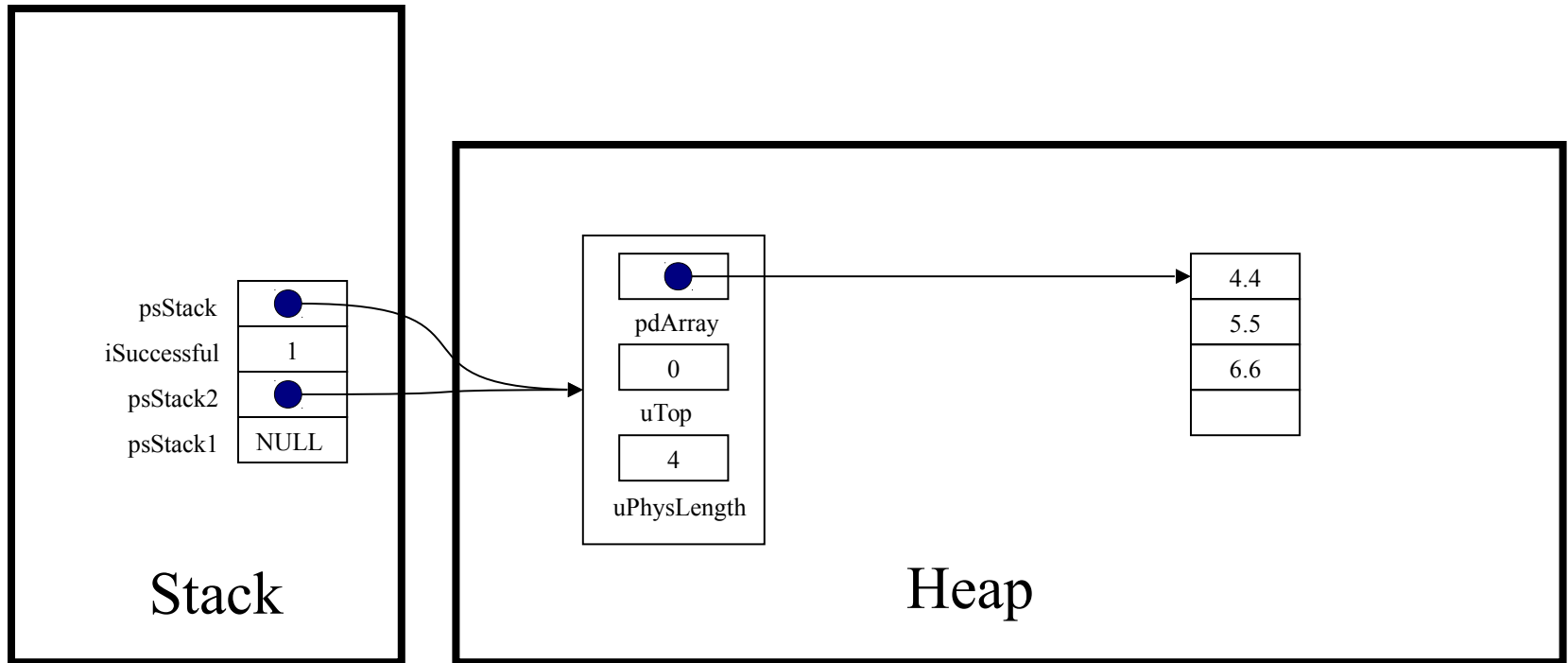
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Trace of teststack (Version 1)

```
int Stack_isEmpty(struct Stack *psStack)
```



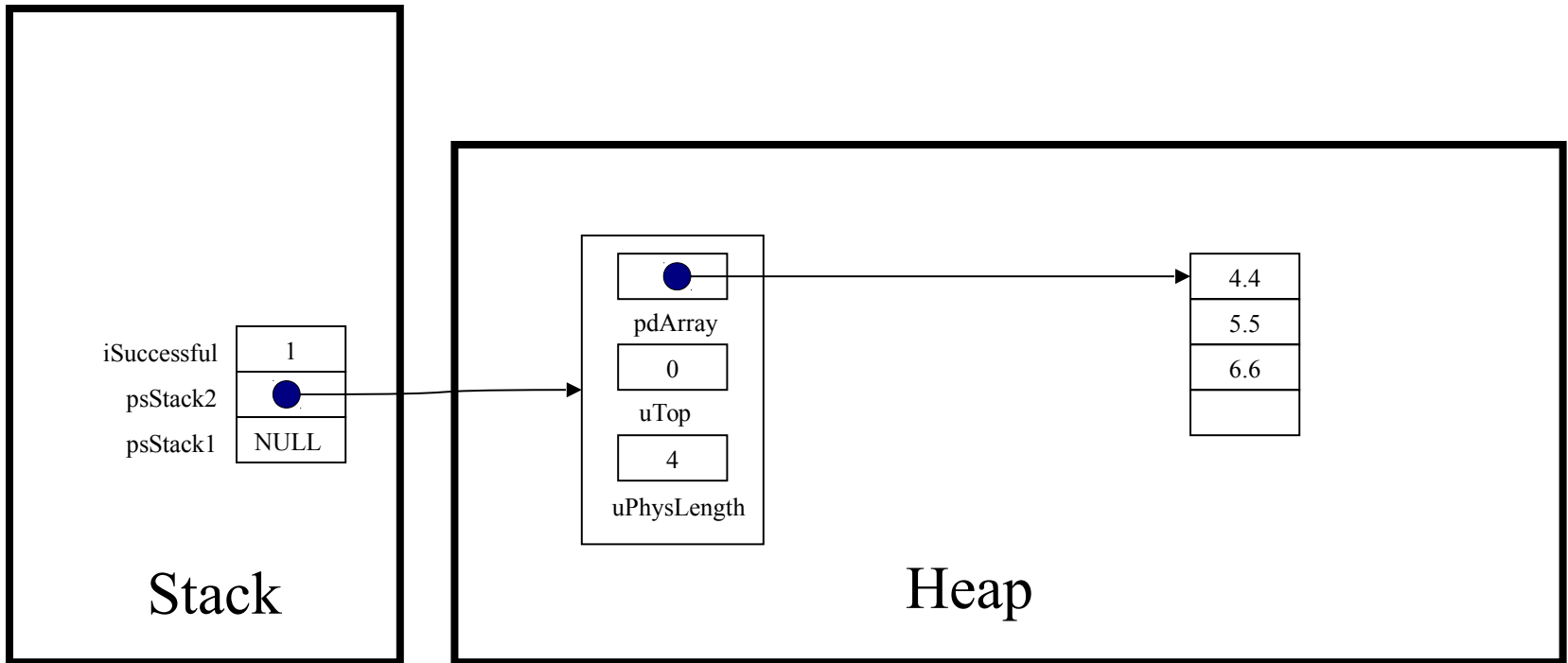
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```
assert (psStack != NULL);
```



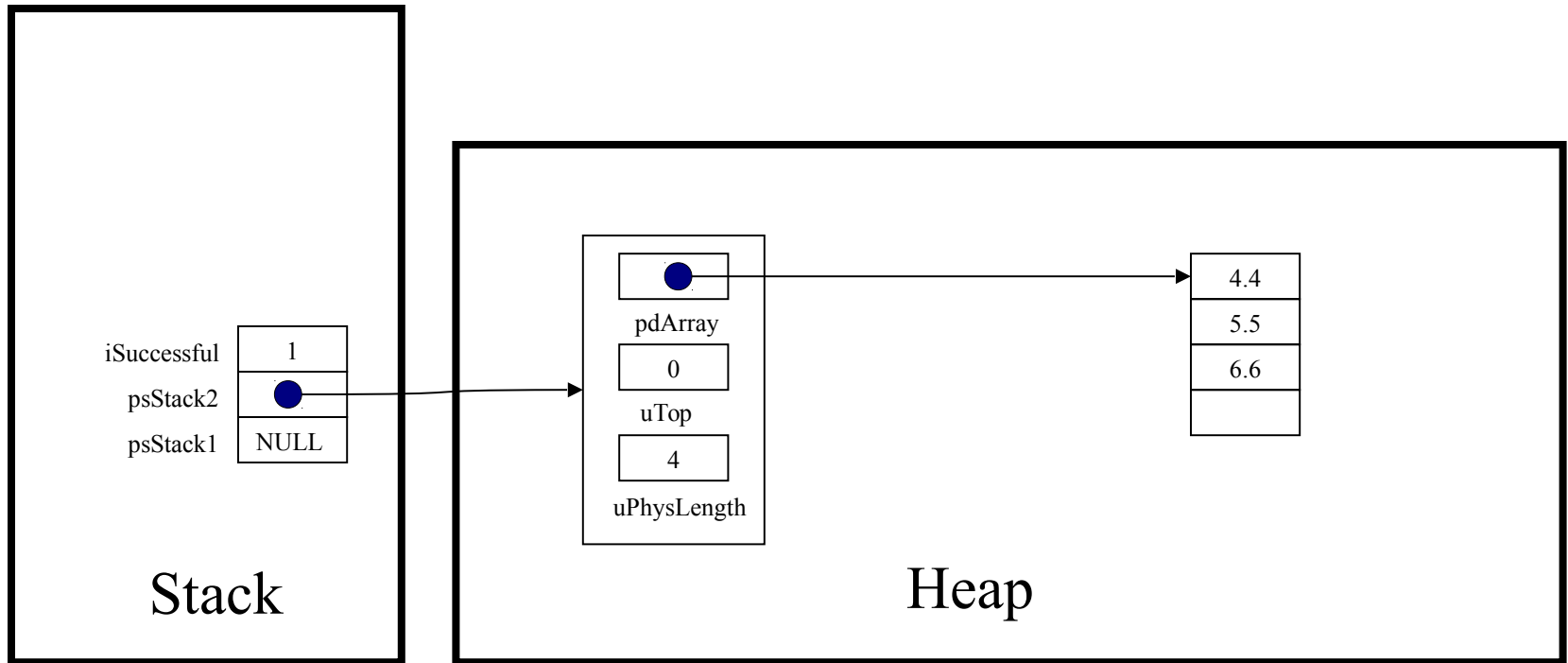
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```
return psStack->uTop == 0;
```



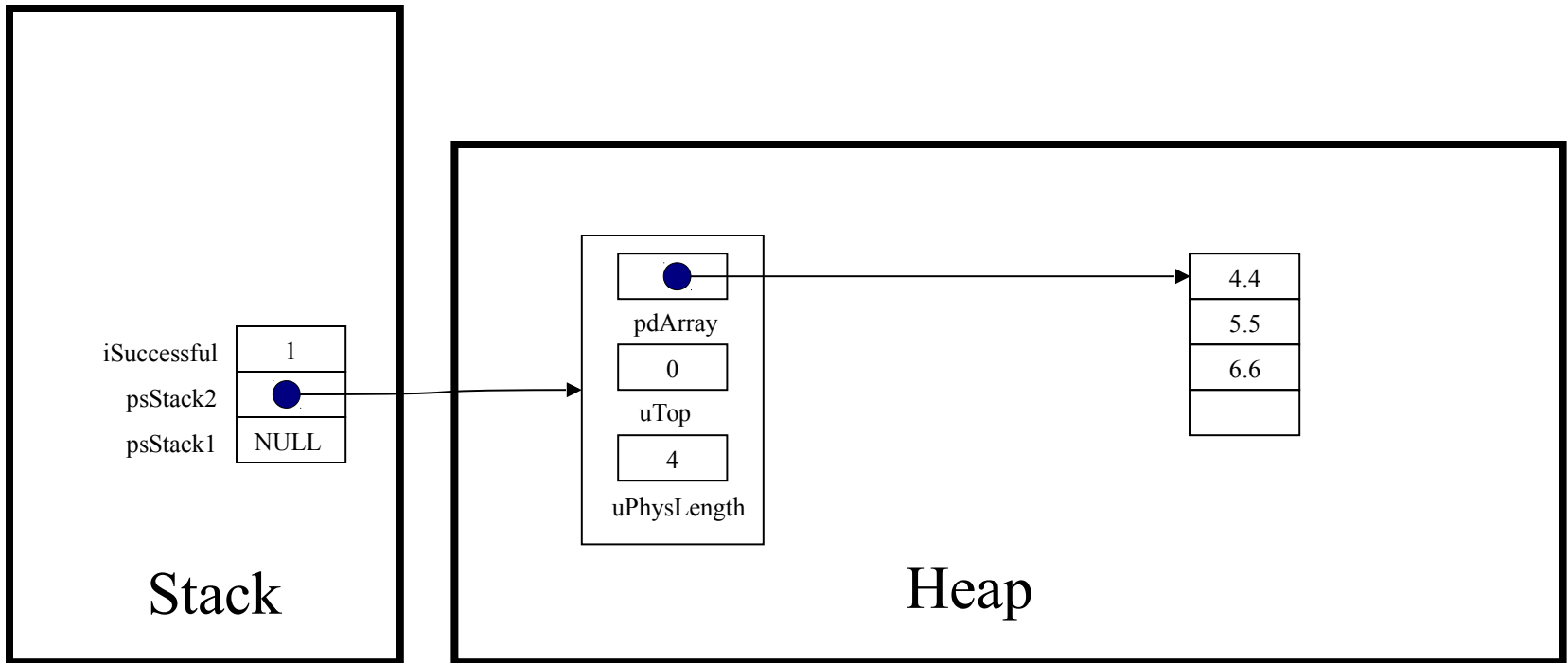
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```
while (! Stack_isEmpty(psStack2))
```



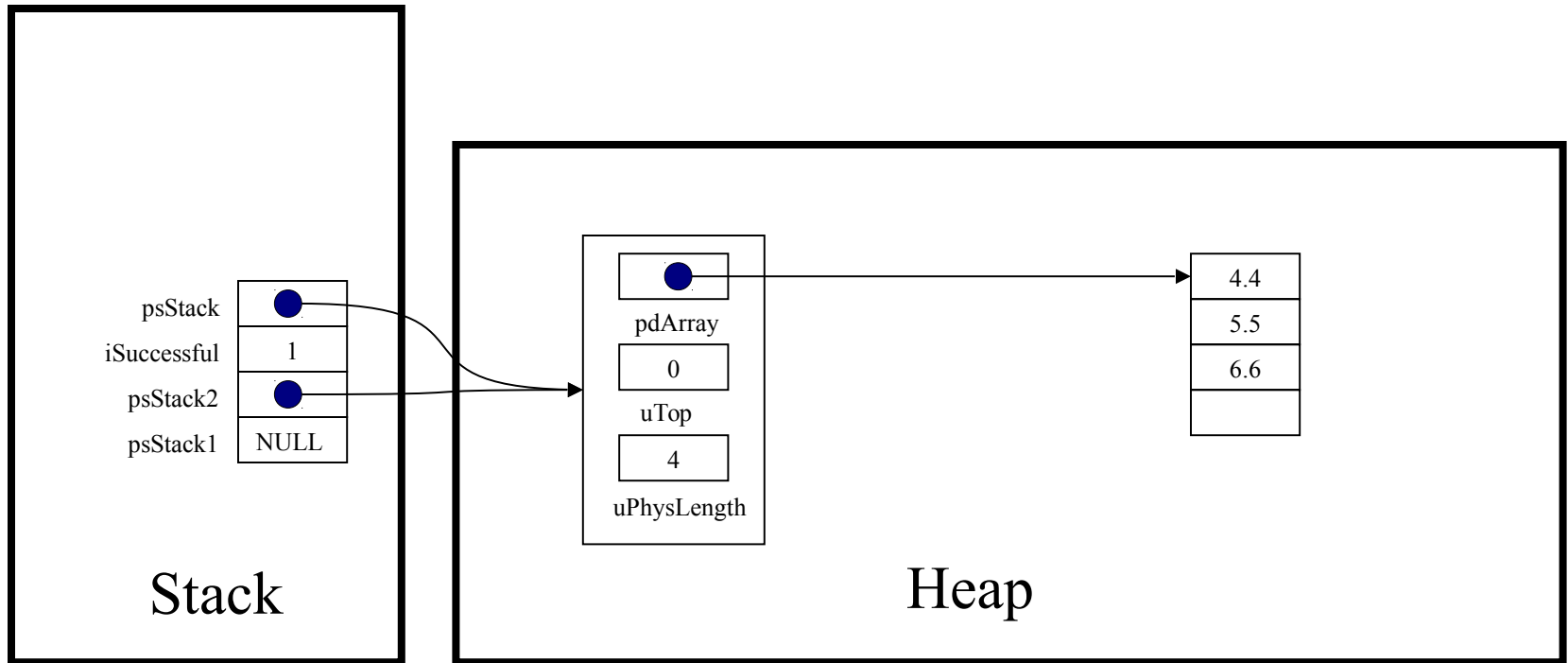
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Trace of teststack (Version 1)

```
Stack_free(psStack2);
```



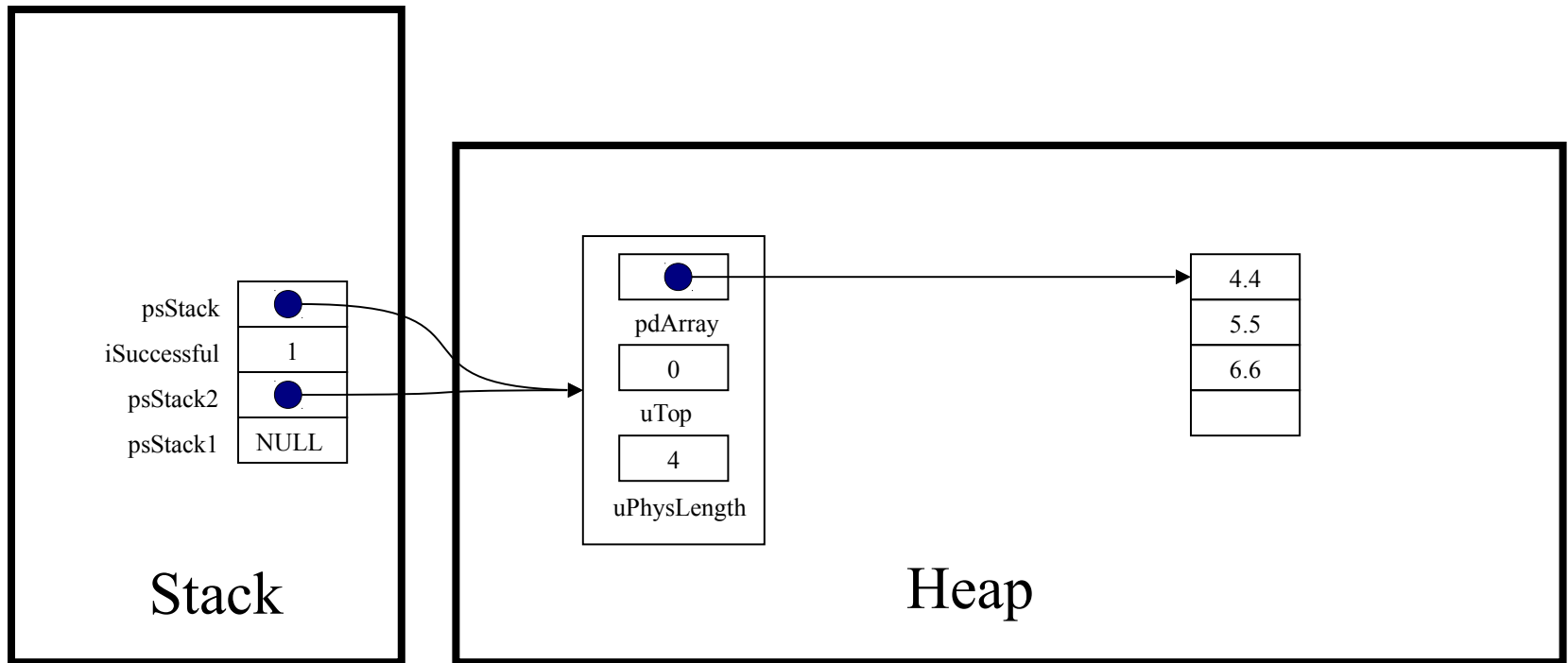
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```
void Stack_free(struct Stack *psStack)
```



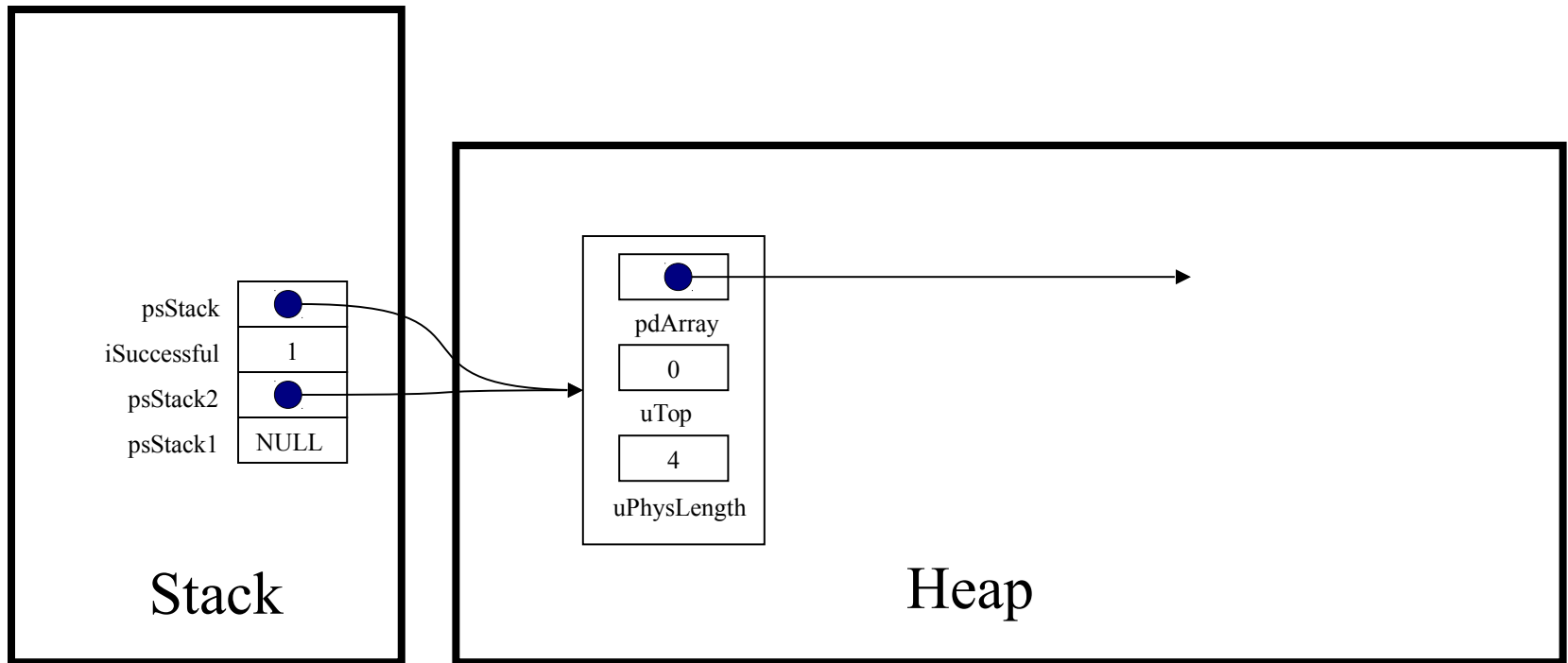
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```
assert (psStack != NULL);
```



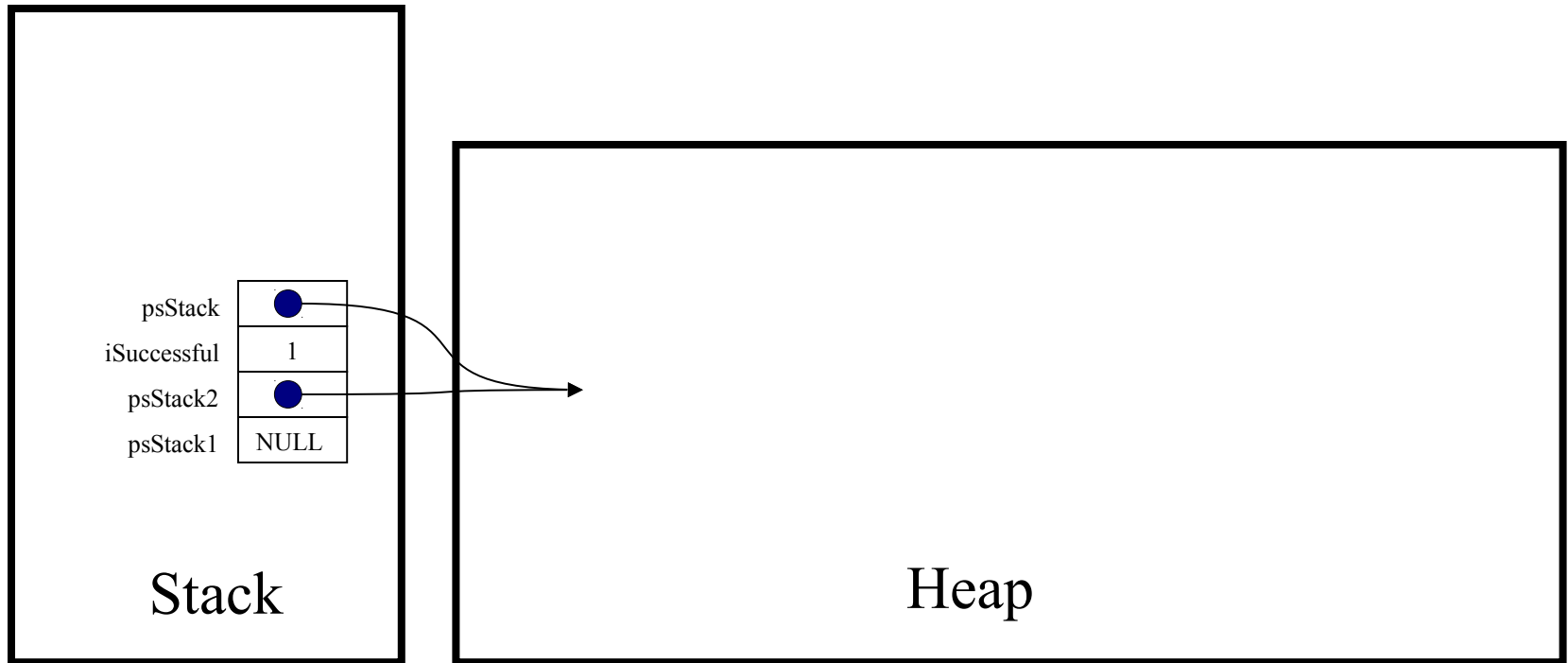
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```
free (psStack->pdArray);
```



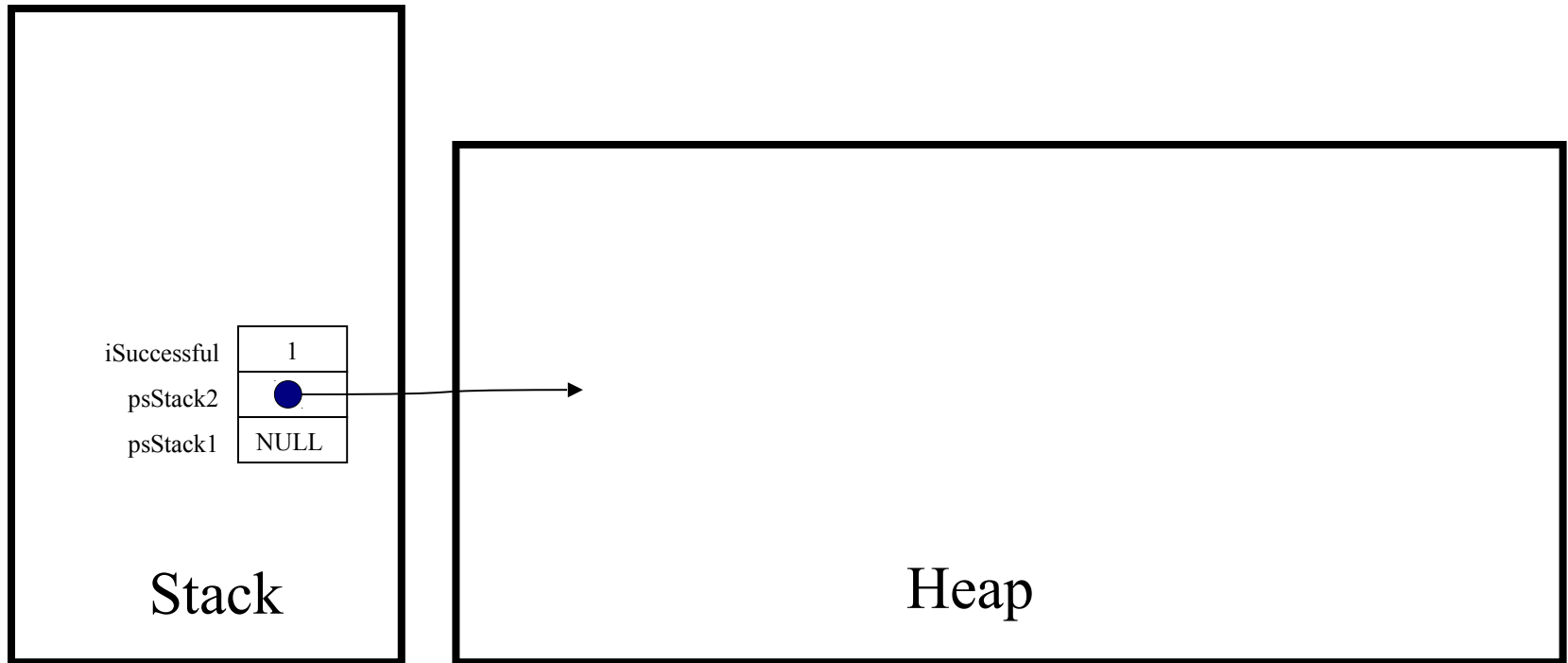
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```
free(psStack);
```



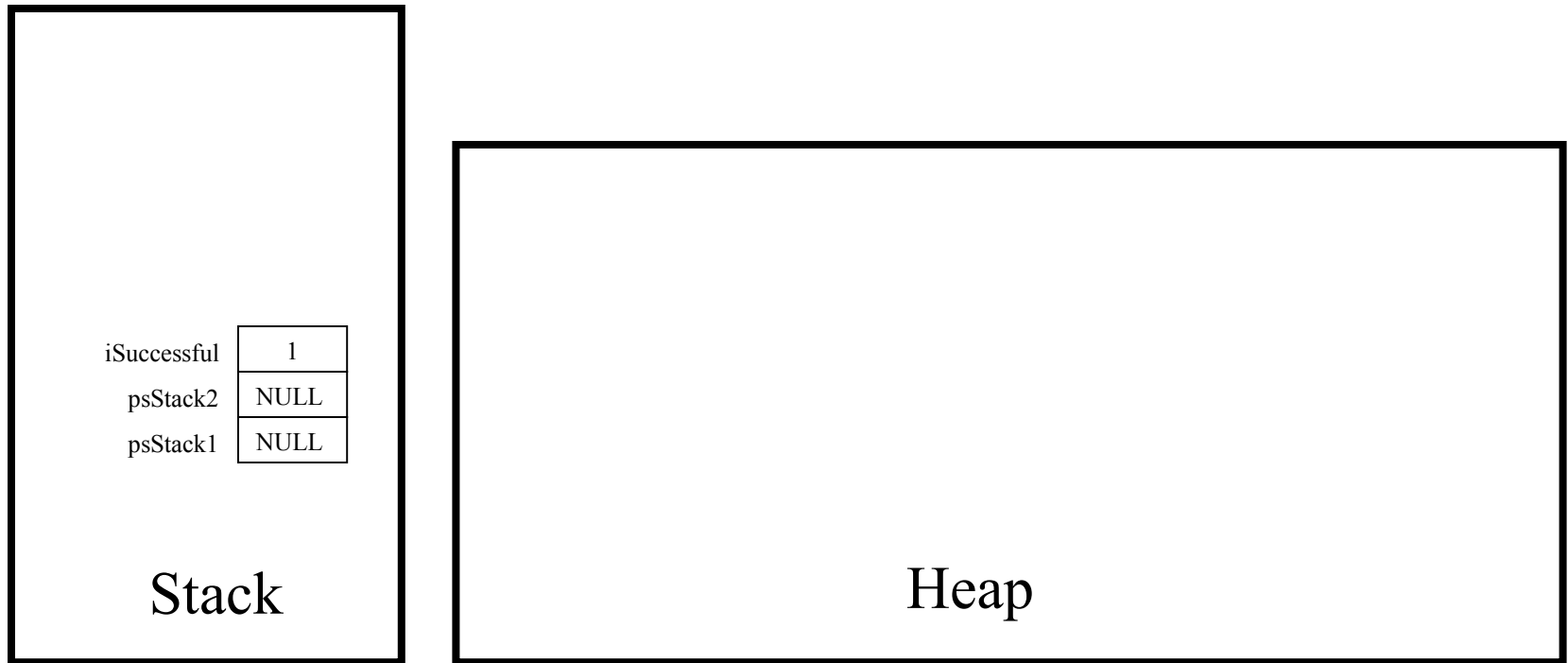
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Implicit return



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```
psStack2 = NULL;
```



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```
return 0;
```

