

Princeton University
 COS 217: Introduction to Programming Systems
 Manipulating C Strings

| String Operation | String in Stack | String in Rodata Section |
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| Allocating memory for a string | <pre>{ char ac[5]; ... }</pre> | <pre>{ "hi"... ... }</pre> |
| Initializing a string | <pre>{ char acA[3] = {'h', 'i', '\0'}; char acB[] = {'h', 'i', '\0'}; char acC[2] = {'h', 'i', '\0'}; /* Compile-time warning */ char acD[10] = {'h', 'i', '\0'}; char acE[3] = "hi"; char acF[] = "hi"; char acG[2] = "hi"; /* Truncation without warning */ char acH[10] = "hi"; ... }</pre> | <pre>{ "hi"... ... }</pre> |
| Computing the length of a string | <pre>{ char ac[10] = "hello"; /* Evaluates to 5 */ ... strlen(ac) ... /* Evaluates to 10 */ ... sizeof(ac) ... }</pre> | <pre>{ char *pc = "hello"; /* Evaluates to 5 */ ... strlen(pc) ... /* Evaluates to 4 */ ... sizeof(pc) ... }</pre> |
| Changing the characters of a string | <pre>{ char ac[10] = "hi"; /* Compile-time error. */ ac = "bye"; /* The long way. */ ac[0] = 'b'; ac[1] = 'y'; ac[2] = 'e'; ac[3] = '\0'; /* The shortcut. */ strcpy(ac, "bye"); /* Dangerous. */ }</pre> | (Runtime error to attempt to change the characters of a string that resides in the rodata section) |
| Concatenating characters onto a string | <pre>{ char ac[10] = "hi"; /* Compile-time error. */ ac += "bye"; /* The long way. */ ac[2] = 'b'; ac[3] = 'y'; ac[4] = 'e'; ac[5] = '\0'; /* The shortcut. */ strcat(ac, "bye"); /* Dangerous. */ }</pre> | (Runtime error to attempt to change the characters of a string that resides in the rodata section) |

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| Comparing one string with another | <pre>{ char acA[] = "hi"; char acB[] = "bye"; /* Legal, but compares addresses!!! */ if (acA < acB) ... /* Compares strings */ if (strcmp(acA, acB) < 0) ... }</pre> | (Same as string in stack) |
| Reading a string | <pre>{ char ac[10]; /* Reads a word as a string. */ iConvCount = scanf("%s", ac); /* Dangerous. */ /* Reads a line as a string, removing the \n character. */ iRet = gets(ac); /* Dangerous. */ /* Reads a line as a string, retaining the \n character. */ iRet = fgets(ac, 10, stdin); }</pre> | (Runtime error to attempt to change the characters of a string that resides in the rodata section) |
| Writing a string | <pre>{ char ac[] = "hi"; /* Writes a string. */ iCharCount = printf("%s", acStr); /* Writes a string, appending a \n character. */ iSuccessful = puts(ac); /* Writes a string. */ iSuccessful = fputs(ac, stdout); }</pre> | (Same as string in stack) |
| Converting a string to another type | <pre>{ char ac[] = "123"; int i; long l; double d; iConvCount = sscanf(ac, "%d", &i); i = atoi(ac); l = atol(ac); d = atof(ac); }</pre> | (Same as string in stack) |
| Converting another type to a string | <pre>{ char ac[10]; int i = 123; iCharCount = sprintf(ac, "%d", i); /* Dangerous. */ }</pre> | (Runtime error to attempt to change the characters of a string that resides in the rodata section) |

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