

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

String Operation	String in Stack	String in Rodata Section
Allocating memory for a string	<pre>{ char pcStr[5]; ... }</pre>	<pre>{ "hi"... ... }</pre>
Initializing a string	<pre>{ char pcStr1[3] = {'h', 'i', '\0'}; char pcStr2[] = {'h', 'i', '\0'}; char pcStr3[3] = "hi"; char pcStr4[] = "hi"; char pcStr5[2] = "hi"; /* truncation */ char pcStr6[20] = "hi"; ... }</pre>	<pre>{ "hi"... ... }</pre>
Computing the length of a string	<pre>{ char pcStr[20] = "hi"; ... sizeof(pcStr) ... /* Evaluates to 20 */ ... strlen(pcStr) ... /* Evaluates to 2 */ }</pre>	<pre>{ char *pcStr = "hi"; ... sizeof("hi") sizeof(pcStr) ... /* Evaluate to 4 */ ... strlen("hi") strlen(pcStr) ... /* Evaluate to 2 */ }</pre>
Changing the characters of a string	<pre>{ char pcStr[20] = "hi"; pcStr = "bye"; /* compiletime error */ pcStr[0] = 'b'; pcStr[1] = 'y'; pcStr[2] = 'e'; pcStr[3] = '\0'; strcpy(pcStr, "bye"); /* Danger of memory corruption. */ }</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 pcStr[20] = "hi"; pcStr += "bye"; /* compiletime error */ pcStr[2] = 'b'; pcStr[3] = 'y'; pcStr[4] = 'e'; pcStr[5] = '\0'; strcat(pcStr, "bye"); /* Danger of memory corruption. */ }</pre>	(Runtime error to attempt to change the characters of a string that resides in the rodata section)

Comparing one string with another	<pre>{ char pcStr1[] = "hi"; char pcStr2[] = "bye"; if (pcStr1 < pcStr2) ... /* Legal, but compares pointers!!! */ if (strcmp(pcStr1, pcStr2) < 0) ... /* Compares strings */ }</pre>	(Same as string in stack)
Reading a string	<pre>{ char pcStr[20]; iConvCount = scanf("%s", pcStr); /* Reads a word as a string. Grave danger of memory corruption. */ iRet = gets(pcStr); /* Reads a line as a string, removing the \n character. Grave danger of memory corruption. */ iRet = fgets(pcStr, 20, stdin); /* Reads a line as a string, retaining the \n character. */ }</pre>	(Runtime error to attempt to change the characters of a string that resides in the rodata section)
Writing a string	<pre>{ char pcStr[] = "hi"; iCharCount = printf("%s", pcStr); /* Writes a string. */ iSuccessful = puts(pcStr); /* Writes a string, appending a \n character. */ iSuccessful = fputs(pcStr, stdout); /* Writes a string. */ }</pre>	(Same as string in stack)
Converting a string to another type	<pre>{ char pcStr[] = "123"; int i; long l; double d; iConvCount = sscanf(pcStr, "%d", &i); i = atoi(pcStr); l = atol(pcStr); d = atof(pcStr); }</pre>	(Same as string in stack)
Converting another type to a string	<pre>{ char pcStr[20]; int i = 123; iCharCount = sprintf(pcStr, "%d", i); /* Danger of memory corruption. */ }</pre>	(Runtime error to attempt to change the characters of a string that resides in the rodata section)