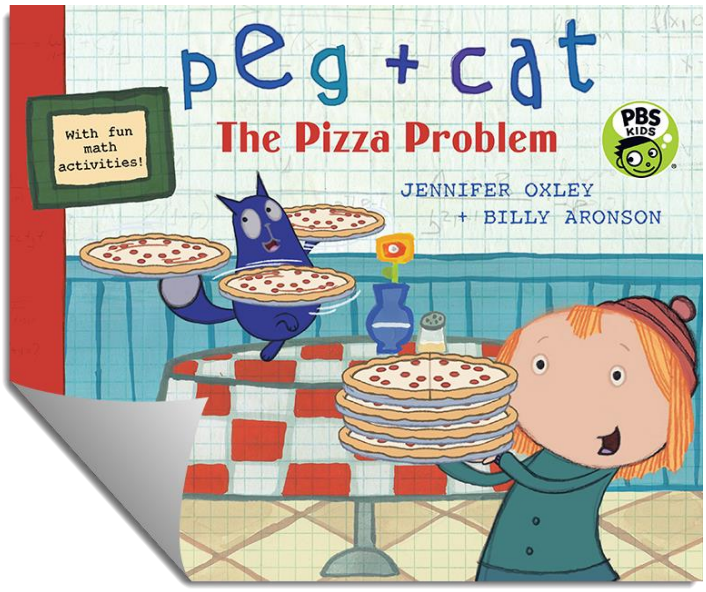
Practice Problems for PE09

For **PE09** you'll one problem which will use pointers and C-Style strings. Here are some additional programming problems you can use for practice. As always, the actual problem on the exam will be similar to, but not necessarily the same as, one of these problems.



1 The myStrChr Function

Write the function **myStrChr()**. The function has two parameters: a **const char * s** pointing to the first character in a C-style string, and a **char c.** Return a pointer to the first appearance of **c** appearing inside **s** and **nullptr** if **c** does not appear inside **s**.

```
const char * s = "Aardvark";
myStrChr(s, 'a')->&s[1]
myStrChr(s, 'V')->nullptr
```

2 The findFirst Function

Write the function **findFirst()**. The function has two parameters: a **const char * s1** pointing to the first character in a C-style string, and a **const char * s2.** Return a pointer to the first appearance of **s2** appearing inside **s1** and **nullptr** (**0**) if **s2** does not appear inside **s**.

```
const char * s = "Aardvark";
findFirst(s, "dv")->&s[3]
findFirst(s, "arki")->nullptr
```

3 THE FINDLAST FUNCTION

Write the function **findLast()**. The function has two parameters: a **const char * s1** pointing to the first character in a C-style string, and a **const char * s2.** Return a pointer to the last appearance of **s2** appearing inside **s1** and **nullptr** (**0**) if **s2** does not appear inside **s**.

```
const char * s = "Aardvark";
findLast(s, "ar")->&s[5]  // "ark"
findLast(s, "K")->nullptr
```

4 THE FINDANY FUNCTION

Write the function **findAny()**.The function has two parameters: a **const char * s** pointing to the first character in a C-style string, and a **const char** * letters. Return the index of the first character in s that matches any letter inside letters. Return -1 if no letters match.

```
const char * s = "This is a test.";
findAny(s, "aeiou")->2      // any vowel
findAny(s, " \t\n\r")->4    // any whitespace
findAny(s, "Bob")->-1       // None found
```

5 THE NUMCHR FUNCTION

Write the function **numChr()**.The function has two parameters: a **const char * s** pointing to the first character in a C-style string, and a **char c**. Return the number of times that **c** appears inside **s**.

```
const char * s = "abracadabra";
numChar(s, 'a')->7
numChar(s, 'A')->0
```

6 THE NUMSTR FUNCTION

Write the function **numStr()**.The function has two parameters: a **const char * s1** pointing to the first character in a C-style string, and a **const char * s2**. Return the number of times that **s2** appears inside **s1**.

```
const char * s = "abracadabra";
numStr(s, "a")->7
numStr(s, "bara")->2
numStr(s, "cad")->1
```

7 THE RFINDANY FUNCTION

Write the function **rFindAny()**.The function has two parameters: a **const char * s** pointing to the first character in a C-style string, and a **const char** * letters. Return the index of the last character in s that matches any letter inside letters. Return -1 if no letters match.

```
const char * s = "This is a test.";
rFindAny(s, "aeiou")->11      // last vowel
rFindAny(s, " \t\n\r")->9    // last whitespace
rFindAny(s, "Bob")->-1       // None found
```

8 THE MYSTRRCHR FUNCTION

Write the function **myStrrChr()**. The function has two parameters: a **const char * s** pointing to the first character in a C-style string, and a **char**, **c**. Return a pointer to the last appearance of c appearing inside **s** and **nullptr** (**0**) if **c** does not appear inside **s**.

```
const char * s = "Aardvark";
myStrrChr(s, 'a')->&s[5]
myStrrChr(s, 'V')->nullptr
```

9 THE MYSTRNCPY FUNCTION

Write the function **myStrNCpy()**. The function has three parameters: a **char * dest**, a **const char * src**, and an **int max**, which represents the maximum size of the destination buffer. Copy the characters in **src** to **dest**, but don't copy more than **max-1** characters. Make sure you correctly terminate the copied string. The function returns a pointer to the first character in **dest**.

10 THE MYSTRNCAT FUNCTION

Write the function **myStrNCat()**. The function has three parameters: a **char * s1**, a **const char * s2**, and an **int max**, which represents the maximum size of the **s1** buffer. Append the characters in **s2** to the end of **s1**. Make sure you have only one **'\0'** at the end of the combined characters. Don't go beyond the end of the buffer you are asked to copy to. The function returns a pointer to the first character in **s1**.

11 THE REPLACE PROBLEM

Write the function **replace()**. The function has three parameters: a **char * s**, a **char c1** and a **char** c2. Replace all instances of **c1** with **c2**. Return a pointer to the first character in **s**.

12 The cSubstr Function

Write the function `cSubstr(dest, begin, end, capacity)`. Given 2 pointers, begin and end, which point to the elements in a C-String, copy the characters between the pointers to the destination buffer. However make sure you don't exceed the capacity of the buffer. Make sure you null terminate the destination. Return a pointer to the destination buffer. Use ONLY pointers, and addresses, not integer counters.

13 The cStrFind Function

Write the function `cStrFind()`. The function has two parameters: a `const char * str`, and a `const char * subs`. Find the first location where `subs` is found in `str` (as an `int`). Return `-1` if `subs` is not located in `str`. You may use pointer or array notation, but you cannot use any functions or classes from the standard library.

14 THE CSTRRFIND FUNCTION

Write the function `cStrRFind()`. The function has two parameters: a `const char * str`, and a `const char * subs`. Find the last location where `subs` is found in `str` (as an `int`). Return `-1` if `subs` is not located in `str`. You may use pointer or array notation, but you cannot use any functions or classes from the standard library.