

Lab Exercise #02

Write following programs in C++

Note:

- *Use pointers to navigate through arrays/strings*
- *Do not use any string library function*
- *Use new and delete operators*
- *Use cin and cout objects for input and output*

1. Create three integer pointers pa, pb, pc and allocate memory dynamically. Read three integers into memories pointed by these pointers and output the largest among these data values. Free the dynamically allocated memory.
2. Create a dynamic array of integers of size n , specified by the user and using a pointer input all values into array elements. Navigate through array elements using pointer and pick up minimum element from the array, and output it.

Don't forget to free all dynamically allocated memory.

3. Write a function that takes a string (containing ['a'-'z']) as input and returns the character that occurs with maximum frequency. If more than one character has maximum frequency, return the alphabetically smallest character among them. Use a pointer to traverse the string.
4. Write a function, which takes a string and returns its reverse. Reverse of a string is defined as the string obtained by reversing the order of characters.

For example, given an input string, "regit", on reversing the string, we get "tiger".

5. Given a string $str1$, write down a function substring, which extracts the first n characters starting from position p in $str1$ (assume first position is 1), and store this substring into $str2$. If the input values are invalid, print an error message.

For example from string "200701123", you get program code "01" by extracting 2 characters starting from 5th position. Implement the function substring, suggested function prototype is :

```
int substr(char* s1, int pos, int n, char* s2);
```

The function returns 1 if successful or 0 on any invalid inputs.
An example function call is as follows:

```
int valid = substr(stud_id, 5, 2, pcode)
```

6. Write a function **isPalindrome**, function takes character array based string as input and returns true if string is palindrome, otherwise returns false.

“A *palindrome* is a word or *sentence* that reads the same forward as it does backward.”

For example, “ABCDBA” is not a palindrome. “MalayalaM” is a palindrome.

Additional Exercise: Find and Replace

7. The function `find_replace()`, replaces all the occurrences of `string2` in `string1` with `string3`.

For example you have following string, say `str1`

"C is one of the world's most modern programming languages. There is no language as versatile as C, and C is fun to use."

`find_replace` function replaces all occurrences of "C" (`str2`) with "C++" (`str3`)

Implement the `find_replace` function with the proposed prototype -

```
void find_replace(char* str1, char* str2, char* str3);
```

You can assume that `str1` has enough memory allocated to accommodate its increased size.