CS217 - Object Oriented Programming

Assignment 1

Note: You have to write the code by hand on a piece of paper. Kindly pay attention to the proper indentation of the code.

1. Assuming that a text file named FIRST.TXT contains some text written into it, write a function named vowelwords(), that reads the file FIRST.TXT and creates a new file named SECOND.TXT, to contain only those words from the file FIRST.TXT which start with a lowercase vowel (i.e., with 'a', 'e', 'i', 'o', 'u').

   For example,

   If the file FIRST.TXT contains the text: **Carry umbrella and overcoat when it rains**, then the file SECOND.TXT shall contain: **umbrella and overcoat it**

2. Write a user-defined function in C++ to read the content from a text file OUT.TXT, count and display the number of alphabets present in it.

3. Write a function in C++ to print the count of word “the” as an independent word in a text file STORY.TXT.

   For example,

   The content of the file STORY.TXT is: **There was a monkey in the zoo. The monkey was very naughty.**

   The function must return 2.

4. Write a menu driven C++ program to do the following operations on a two dimensional array A of size m x n. You should use user-defined functions which accept 2-D array A, and its size m and n as arguments. The options are:

   a. To input elements into matrix of size m x n
   b. To display elements of matrix of size m x n
   c. Sum of all elements of matrix of size m x n
   d. To display row-wise sum of matrix of size m x n
   e. To display column-wise sum of matrix of size m x n
   f. To create transpose of matrix B of size n x m

5. Write a user defined function named Upper-half() which takes a two dimensional array A, with size N rows and N columns as argument and prints the upper half of the array.

For example, if the input is,

```
2 3 1 5 0
7 1 5 3 1
2 5 7 8 1
3 4 9 1 5
2 1 3 2 8
```

The output will be,

```
2 3 1 5 0
  1 5 3 1
    7 8 1
      1 5
        8
```

6. Write the output of the following program. Assume that all necessary header files are included.

```
void encrypt(char T[])
{
   for (int i = 0; T[i] != '\0'; i += 2)
      if (T[i] == 'A' || T[i] == 'E')
         T[i] = '#';
      else if (islower(T[i]))
         T[i] = toupper(T[i]);
      else
         T[i] = '@';
}

int main()
{
   char text[]="SaVE EArtH";
   encrypt(text);
   cout << text << endl;
   return 0;
}
```

7. Write a C++ program to reverse the element of an integer 1-D array.

8. Suppose X. Y, Z are arrays of integers of size M, N, and M + N respectively. The numbers in array X and Y appear in descending order. Write a user-defined function in C++ to produce third array Z by merging arrays X and Y in descending order.

9. Write a program to compute the cosine of x. The user should supply x and a positive integer n. We compute the cosine of x using the series and the computation should use all terms in the series up through the term involving xn

cos x = 1 - x2/2! + x4/4! - x6/6! .....