Lab 5

Problem 1:

Write a C++ program that reads a list of integers from the user until they enter a negative number. Store these integers in a dynamically allocated array. Find the sum and average of the numbers and display them.

```
Enter a number (< 0 to exit): 1
Enter a number (< 0 to exit): 2
Enter a number (< 0 to exit): 3
Enter a number (< 0 to exit): 4
Enter a number (< 0 to exit): 5
Enter a number (< 0 to exit): 6
Enter a number (< 0 to exit): -1

{ 1, 2, 3, 4, 5, 6,  }
The sum of the numbers is: 21
The average of the numbers is: 3
```

Problem 2:

Write a program that generates the first 20 terms of the Fibonacci sequence using an array. Display the sequence, and then find and print the sum of the even terms.

```
The first 20 values of the fibonacci sequence are:
1  ->  1  ->  2  ->  3  ->
5  ->  8  ->  13  ->  21  ->
34  ->  55  ->  89  ->  144  ->
233  ->  377  ->  610  ->  987  ->
1597  ->  2584  ->  4181  ->  6765  ->
```

Problem 3:

Define a function calculateArea that takes the radius of a circle as a parameter and returns its area. Use this function to calculate and print the area of a circle with a given radius.

```
The area of a circle with a radius of 1 is 3.14159
The area of a circle with a radius of 5.4 is 91.6088
The area of a circle with a radius of 9.5 is 283.529
```

Problem 4:

Create an inline function that calculates the cube of a number. Define a macro that does the same. Compare and contrast the usage of the inline function and the macro in a C++ program.

```
The inline cube function for 6 is 216
The inline cube function for 7 is 343
The macro cube function for 6 is 216
The macro cube function for 0 is 0
```

Inline Function	*Macro*
Marking a function as inline is only a request to the compiler to expand the body of the function to wherever the function call is. This can be useful since there is type checking, but is not guaranteed to be done.	Defining a macro means that the code will be textually replaced throughout the body. This contrasts the inline function since there is no type-checking and various types of errors could occur. This is guaranteed to be replaced throughout the code though.

Lab 5

Problem 5:

Develop a C++ program that reads a sentence from the user and reverses the order of words in the sentence without changing the order of characters in each word. Display the reversed sentence.

```
Please enter a sentence
  - The words will be reversed
  - The letters of the words will remain unchanged

> Hello this is weston shakespear
You entered:    'Hello this is weston shakespear'
Result:
Shakespear weston is this hello
```