Assignment # 1

Submission Date: 28th September 2022
Subject: CS4002- Applied Programming.

1. State the order of evaluation of the operators in each of the following C++ statements and show the value of x after each statement is performed.

a) **x = 7 + 3 * 6 / 2 - 1;** **Ans: *, /, +, -, =, 15 (Example)**

b) **x = 2 % 2 + 2 * 2 - 2 / 2;** **Ans:** %, *, /, +, -, =,3

c) **x = (3 * 9 * (3 + (9 * 3 / (3))));** **Ans:** (), *, /, +, -, =,324

2. Write a program that finds the GPA?

ANS:

```
#include<iostream>
#include<string>
using namespace std;
int main() {
    char grade[2];
    double gpa=0.0;
    cout<<"Enter your Grade= ";
    cin>>grade;
    switch(grade)
    {
    case'A+':
      case'a+':
      gpa=4.0;
    cout<<"your GPA is "<<gpa;
    break;
    case'A':
      case'a':
      gpa=4.0;
    cout<<"your GPA is "<<gpa;
    break;
    case'A-':
      case'a-':
      gpa=3.67;
    cout<<"your GPA is "<<gpa;
    break;
    case'B+':
       case'b+':
       gpa=3.33;
    cout<<"your GPA is "<<gpa;
    break;
    case'B':
       case'b':
       gpa=3.0;
    cout<<"your GPA is "<<gpa;
    break;
    case'B-':
       case'b-':
       gpa=2.67;
```

```
cout<<"your GPA is "<<gpa;
break;
case'C+':
    case'c+':
    gpa=2.33;
cout<<"your GPA is "<<gpa;
break;
case'C+':
    case'c+':
    gpa=2.33;
cout<<"your GPA is "<<gpa;
break;
case'C':
    case'c':
    gpa=2.0;
cout<<"your GPA is "<<gpa;
break;
case'F':
     case'f':
     gpa=0.0;
cout<<"your GPA is "<<gpa;
break;
default:
   cout<<"invalid grade entered";
break;
}
return 0;
}
```

3. Write a program that solves the quadratic equation.

Ans:

```
#include <iostream>
using namespace std;

int main () {
int a,b,c;
cout<<"Enter coefficient of x^2: \n";
cin>>a;
cout<<"Enter coefficient of x: \n";
cin>>b;
cout<<"Enter constant: \n";a
cin>>c;
float y= (-b+(b*b-4*a*c) ^ (1/2)) / (2*a);
float z= (-b-(b*b-4*a*c) ^ (1/2)) / (2*a);
cout<<"The roots of your given equations are:  "<<y<<" and "<<z<<endl;

   return 0;
}
```

4. Write a program that prints prime no's from 1 to 100?

```
#include<iostream>
using namespace std;
int main ()
{
   for (int i=2; i<100; i++)
      for (int j=2; j<i; j++)
      {
         if (i % j == 0)
            break;
         else if (i == j+1)
            cout << i << " ";
      }
   return 0;
    }
```

5. Write a program that reverses any given, no? Use the Divide by 10 rule.

```
#include <iostream>
using namespace std;

int main () {

  int num, reversed_num = 0, remainder;

  cout << "Enter a Number: ";
  cin >> num;

  while (num! =0) {
   remainder = num%10;
   reversed_num = reversed_num*10+remainder;
   num/=10;
  }

  cout << "Reversed Number = " << reversed_num;

  return 0;
     }
```

6. Write a program that prints the following shapes using escape sequences and loops:

a)

```
*
**
***
****
*****
******
*******
```

b)

```
*******
******
*****
****
***
```

```
**
*
```

c)

```
      *
     **
    ***
   ****
  *****
 ******
*******
```

d)

```
*******
 ******
  *****
   ****
    ***
     **
      *
```

e)
```
**********
*        *
*        *
*        *
**********
```

f)
```
    *
   ***
  *****
 *******
*********
```

g)
```
*********
 *******
  *****
   ***
    *
```

h)
```
9       7       5       3       1
        9       7       5
                9
                9
        9       7       5
9       7       5       3       1
```

7. Write a program for the Fibonacci series using recursion?

(Fibonacci series is that when you add the previous two numbers the next number is formed. You have to start from 0 and 1.)

E.g. 0+1=1 → 1+1=2 → 1+2=3 → 2+3=5 → 3+5=8 → 5+8=13

So the series becomes

0 1 1 2 3 5 8 13 21 34 55 ……

Steps: You have to take an input number that shows how many terms to be displayed. Then use loops for displaying the Fibonacci series up to that term

E.g. input no is =6 the output should be

0 1 1 2 3 5

Code:

```
#include <iostream>
using namespace std;
int fib(int x)
```

```
{
    if((x==1)||(x==0))
        {
          return(x);
          }
      else
      {
       return(fib(x-1)+fib(x-2));
    }
}
int main()
{
   int x , i=0;
   cout << "Enter the number of terms of
series : ";
   cin >> x;
   cout << "\nFibonnaci Series : ";
   while(i < x)
   {
      cout << " " << fib(i);
      i++;
   }
   return 0;
}
```

8. Identify and correct the error(s) in each of the following:

a)
```
if (age >= 65);
        cout << "Age is greater than or equal to 65" << endl;
   else
        cout << "Age is less than 65 << endl";
```

ANS:

After the r if condition there should not be a semicolon (;) used.

b)
```
if ( age >= 65 )
        cout << "Age is greater than or equal to 65" << endl;
    else;
        cout << "Age is less than 65 << endl";
```

ANS:

After else semicolon (;) is not used.

c)
```
if (age >= 65)
        cout << "Age is greater than or equal to 65" << endl;
        cout<< “Time to retire”;
    else;
        cout << "Age is less than 65 << endl";
```

ANS:

After else semicolon (;) is not used.

d)
```
int x = 1, total;
    while (x <= 10) {
    total += x;
    ++x;
}
```

ANS:

No such error but the variable “total” Should be initialized with Zero.

e)
```
While (x <= 100)
   total += x;
   ++x;
```

ANS:

There are two errors:

i: The correction of the name of the keyword while from “While” to “while”.

ii: Enclosing the second and third statements within curly braces.

f)
```
while (y > 0) {
   cout << y << endl;
   ++y;
}
```

ANS:

Error in the while statement. Because the given statement is an infinite loop because y will keep increasing

9. What does the following program print?

```
using std::cout;
```

```
using std::endl;
int main()
 {
  int y, x = 1, total = 0;

  while (x <= 10) {y
       = x * x;
       cout << y << endl;
       total += y;
       ++x;
       }

 cout << "Total is " << total << endl;
 return 0;
}
```

Output: std::cout; was not decelerated in the Scope