Lab Assignment 2

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Q1. Write a program to print the numbers from 1 to 10 and their squares.

Ans:

```
#include<iostream>
using namespace std;
int main(){
      int num=10;
      for(int i=1;i<=num;i++){
            cout<<i<<"\t"<<(i*i)<<'\n';
      }
      return 0;
}
```

Output:

```
~/My-files $ g++ assignment2.cpp
~/My-files $ ./a.out
1       1
2       4
3       9
4       16
5       25
6       36
7       49
8       64
9       81
10      100
```

Q2. Write a program to print this triangle.

Ans:

```
#include<iostream>
using namespace std;
int main(){
    int i=0, j=0;
    while(i<10){
        while(j<=i){
            cout<<"*";
            j++;
        }
        i++; j=0;
        cout<<'\n';
    }
    return 0;
}
```

Output:

```
~/My-files $ g++ assignment2.cpp
~/My-files $ ./a.out
*
**
***
****
*****
******
*******
********
*********
**********
```

Q3. Write a program in C++ to check whether an input alphabet is a vowel or not.

Ans:

```
#include<iostream>
using namespace std;
int main(){
    char letter;
    cout<<"Enter a letter : ";
    cin>>letter;
    if(letter=='a'||letter=='e'||letter=='i'||letter=='o'||letter=='u')
    _   cout<<"Letter is vowel\n";
    else
    _   cout<<"Letter is not vowel\n";
    return 0;
}
```

Output:

```
~/My-files $ g++ assignment2.cpp
~/My-files $ ./a.out
Enter a letter : a
Letter is vowel
~/My-files $ ./a.out
Enter a letter : b
Letter is not vowel
~/My-files $ ./a.out
Enter a letter : u
Letter is vowel
~/My-files $ ./a.out
Enter a letter : z
Letter is not vowel
```

Q4. Write a program in C++ to check whether a year entered is a leap year or not.

Ans:

```
#include<iostream>
using namespace std;
int main(){
    int year;
    cout<<"Enter a year : ";
    cin>>year;
    if(year%400==0)
        cout<<"It is a Leap year\n";
    else if(year%100==0)
        cout<<"It is not a Leap year\n";
    else if(year%4==0)
        cout<<"It is a Leap year\n";
    else
        cout<<"It is not a Leap year\n";
    return 0;
}
```

Output:

```
~/My-files $ g++ assignment2.cpp
~/My-files $ ./a.out
Enter a year : 2020
It is a Leap year
~/My-files $ ./a.out
Enter a year : 2021
It is not a Leap year
~/My-files $ ./a.out
Enter a year : 2100
It is not a Leap year
```

Q5. Write a program in C++ to find the roots of a quadratic equation.

Ans:

```
#include<iostream>
#include<math.h>
using namespace std;
int main(){
    float a=0,b=0,c=0;
    cout<<"Enter the x^2 coefficient:";
    cin>>a;
    cout<<"Enter the x coefficient:";
    cin>>b;
    cout<<"Enter the constant:";
    cin>>c;
```

```
    float det=pow(b,2)-(4*a*c);
    if(det>=0){
        det=pow(det, 0.5);
        float root1=(-b+det)/(2*a), root2=(-b-det)/(2*a);
        cout<<"Real Root 1= "<<root1<<"  Real Root 2= "<<root2<<'\n';
    }
    else{
        det=pow(-1*det,0.5);
        float re_root=(-b)/(2*a), im_root1=(det/(2*a)),
              im_root2=(-det/(2*a));
        cout<<"Img Root1= "<<re_root<<" + "<<im_root1<<"i\n";
        cout<<"Img Root2= "<<re_root<<" + "<<im_root2<<"i\n";
    }
    return 0;
}
```

Output:

```
~/My-files $ g++ assignment2.cpp
~/My-files $ ./a.out
Enter the x^2 coefficient:1
Enter the x coefficient:2
Enter the constant:1
Real Root 1= -1  Real Root 2= -1
~/My-files $ ./a.out
Enter the x^2 coefficient:1
Enter the x coefficient:1
Enter the constant:1
Img Root1= -0.5 + 0.866025i
Img Root2= -0.5 + -0.866025i
~/My-files $ ./a.out
Enter the x^2 coefficient:389
Enter the x coefficient:323
Enter the constant:463
Img Root1= -0.415167 + 1.00889i
Img Root2= -0.415167 + -1.00889i
```