Homework 2 Solutions
Group B

1- **Write a C++ program to read a students' score in Statistics and print if he is successful or failing.**

```cpp
#include <iostream>
#include <conio.h>
int main ()
{
 int score;
 cout<<'\nEnter Student's score: ";
 cin>>score;
 if ((score>=60)&&(score<=100))
  cout<<"Successful";
 else if ((score>=0)&&(score<60))
  cout<<"Failing";
 else
  cout<<"not a valid score";
getch();
return 0;
}
```

2- **Write a C++ program to calculate and print out the almsgiving on an amount of money only if it is more than or equal 10000.**

```cpp
#include <iostream>
#include <conio.h>
int main ()
{
 float amount,giving;
 cout<<'\nEnter an amount: ";
 cin>>amount;
 if (amount >= 10000)
 {
   giving = amount * 0.025;
   cout<<"\n You have to pay: "<<giving;
 }
 else
  cout<<"\n You have not to pay";
getch();
return 0;
}
```

3- Write a C++ program to enter an integer and determine if it is positive, negative or zero.

```cpp
#include <iostream>
#include <conio.h>
int main ()
{
  int num;
  cout<<'\nEnter an integer: ";
  cin>>num;
  if (num>0)
   cout<<"positive";
  else if(num>0)
   cout<<"negative";
  else
   cout<<"zero";
 getch();
 return 0;
}
```

4- Write a C++ program to enter two integers and an operation to be executed on them and calculate the result. Use switch – case.

```cpp
#include <iostream>
#include <conio.h>
int main ()
{
  int x,y;
  char op;
  cout<<'\n Enter num1 operand num2 ";
  cin>>x>>op>>y;
  switch(op)
  {
   case '+':  cout<<"\n sum = "<<x+y;  break;
   case '-':  cout<<"\n difference = "<< x-y;  break;
   case '*':  cout<<"\n multiply = "<< x*y;  break;
   case'/':  cout<<"\n quotient = "<<x/y;  break;
  }
 getch();
 return 0;
}
```

5- Write a C++ program to read the user's age and print a message "you are a child" if age is less than 18, "you are an adult" if age is more than or equal 18 and less than 65 or "you are a senior citizen" if age is more than or equal 65.

```cpp
#include<iostream>
#include<conio.h>
int main()
{
  int age;
  cout<<"\n Please enter your age:  ";
  cin>>age;
  if (age<18)
      cout<<"\n You are a child";
  else if ((age>=18)&&(age<65))
      cout<<"\n You are an adult";
  else
      cout<<"\n You are a senior citizen";
 getch();
 return 0;
}
```

6- Write a C++ program to read a character and print a message "it is a vowel" if character is one of (a,e,i,o,u), "it is an operator" if character is (+,-,*,/) or "it is something else" if any other character. Use if – else, then use switch – case.

```cpp
#include <iostream>
#include <conio.h>
int main ()
{
  char ch;
  cout<<"\n Enter a character:  ";
  cin>>ch;
  switch (ch)
   {
    case 'a': case 'e': case 'i': case 'o': case 'u':  cout<<"\n it is a vowel";  break;
    case '+': case '-': case '*': case '/':  cout<<"\n it is an operator";  break;
    default:  cout<<"\n it is something else";
   }
  getch();
  return 0;
 }
```

```
#include <iostream>
#include <conio.h>
int main ()
{
  char ch;
  cout<<"\n Enter a character:  ";
  cin>>ch;
  if ((ch == 'a')||(ch == 'e')||(ch == 'i')||(ch == 'o')||(ch == 'u'))
      cout<<"\n it is a vowel";
  else  if ((ch == '+')||(ch == '-')||(ch == '*')||(ch == '/'))
      cout<<"\n it is an operator";
  else
      cout<<"\n it is something else";
  getch();
  return 0;
}
```

7- Write a C++ program to read two integer values and use the conditional expression (?) to find and print out if one of them is a 'multiple' or 'not multiple' of the other.

```
#include <iostream>
#include <conio.h>
int main ()
{
  int a,b;
  cout<<"\n a= ";
  cin>>a;
  cout<<"\n b= ";
  cin>>b;
  cout<< ((a%b==0) ? " a multiple": " not a multiple");
  getch();
  return 0;
}
```

8- Write a C++ program to read 4 integer values and print out them in reverse order.

```
#include <iostream>
#include <conio.h>
int main ()
{    int a,b,c,d;
     cout<<"\n enter four integers ";
     cin>>a>>b>>c>>d;
     cout<<d<<", "<<c<<", "<<b<<", "<<a;
     getch();      return 0;
}
```

9- Write a C++ program to read 4 integers, find and print the maximum and the minimum.

```
#include <iostream>
#include <conio.h>
int main ()
{    int a,b,c,d;
     int max,min;
     cout<<"\n enter four integers ";
     cin>>a>>b>>c>>d;
     max = a;  min = a;
      if (max<b)  max=b;          if (min>b)  min=b;
      if (max<c)  max=c;          if (min>c)  min=c;
      if (max<d)  max=d;          if (min>d)  min=d;
     cout<<"\n max value= "<<max;
     cout<<"\n min value= "<<min;
     getch();
     return 0;
  }
```

10-   Write a C++ program to find and print out the solutions of a quadratic equation in one variable. $ax^2 + bx + c = 0$

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
int main()
{
 float a,b,c,d,x1,x2;
 cout<<"\n a= ";        cin>>a;
 cout<<"\n b= ";        cin>>b;
 cout<<"\n c= ";        cin>>c;
 d = pow(b,2) - 4*a*c;
 if ( d>=0 )
   {
    x1 = (-b + sqrt(d))/(2*a);
    x2 = (-b - sqrt(d))/(2*a);
     cout<<"\n real roots: x1= "<<x1<<" and x2= "<<x2;
   }
 else
    cout<<"\n No real roots";
 getch();
 return 0;
}
```

11- Write a C++ program to count the characters, numeric and spaces in a written paragraph.

```cpp
#include <iostream>
#include <conio.h>
// Count blanks, digits, letters, newlines, and others
int main()
{
  char ch;
  int  blank_cnt = 0, digit_cnt = 0,
      letter_cnt = 0, nl_cnt = 0, other_cnt = 0;
  while ((ch = getchar()) != EOF)    /* braces not necessary */
    if (c == ' ')
      ++blank_cnt;
    else if (c >= '0' && c <= '9')
      ++digit_cnt;
    else if ((c >= 'a' && c <= 'z') || (c >= 'A' && c <= 'Z'))
      ++letter_cnt;
    else if (c == '\n')
      ++nl_cnt;
    else
      ++other_cnt;
  cout<<"\n blanks \t digits \t letters \t lines \t others";
  cout<<"\n"<<blank_cnt<<"\t"<<digit_cnt<<"\t"<<letter_cnt<<"\t"<<nl_cnt
      <<"\t"<< other_cnt;
  getch();
  return 0;
}
```

12- **Write a C++ program to enter the income in US Dollars, calculate and print out the income taxes according to the following table:**

Income	Tax value
0<income<=15000	7.5% of the income
15000<income<=30000	10% of the income
30000<income<=55000	15% of the income
income>55000	20% of the income

```cpp
#include<iostream>
#include<conio.h>
int main()
{
 float  income, tax;
 cout<<"\n enter the income in USD: ";
 cin>>income;

 if (income>0 && income<=15000)
  tax = 0.075*income;
 else if (income>15000 && income<=30000)
  tax = 0.1*income;
 else if (income>30000 && income<=55000)
  tax = 0.15*income;
 else if (income>55000)
  tax = 79772 + 0.396*income;

 cout<<"\n tax value = "<<tax;
 getch();
 return 0;
}
```