

*****ASSIGNMENT 4*****

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Q1) /* If a four-digit number is input through the keyboard,
write a program to obtain the sum of the first and last digit of this number.

*/

```
#include<iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    int num,sum=0;
```

```
    cout<<"Enter a 4 digit no :  ";
```

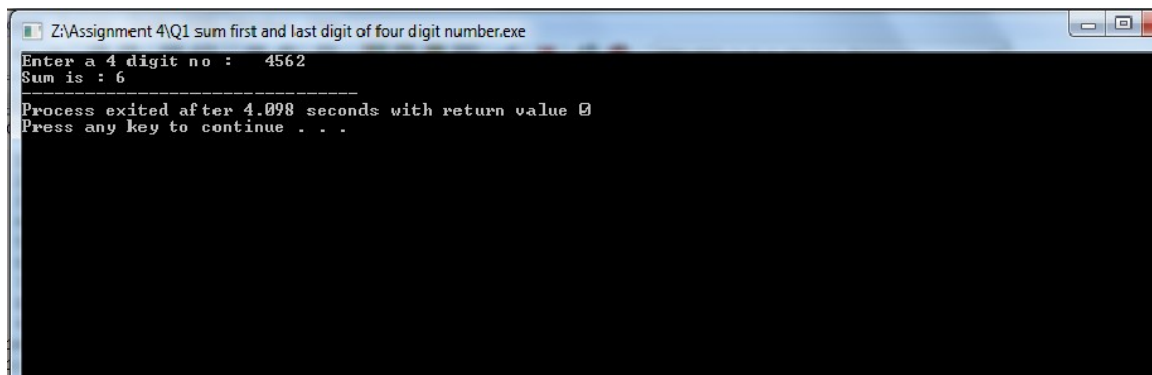
```
    cin>>num;
```

```
    sum=num / 1000 + num % 10; //with num%10 we get last digit
```

```
        //with num/1000 we get first digit
```

```
    cout<<"Sum is : "<<sum;
```

```
}
```



```
Z:\Assignment 4\Q1 sum first and last digit of four digit number.exe
Enter a 4 digit no : 4562
Sum is : 6
-----
Process exited after 4.098 seconds with return value 0
Press any key to continue . . .
```

Q2) /*In a town the percentage of men is 52 the percentage of
total literacy is 48 if total percentage of literate men is
35 of the total population write a program to find the
total no of the literate men and women if the population of
the town is 80,000

*/

```
#include<iostream>
```

```
using namespace std;
```

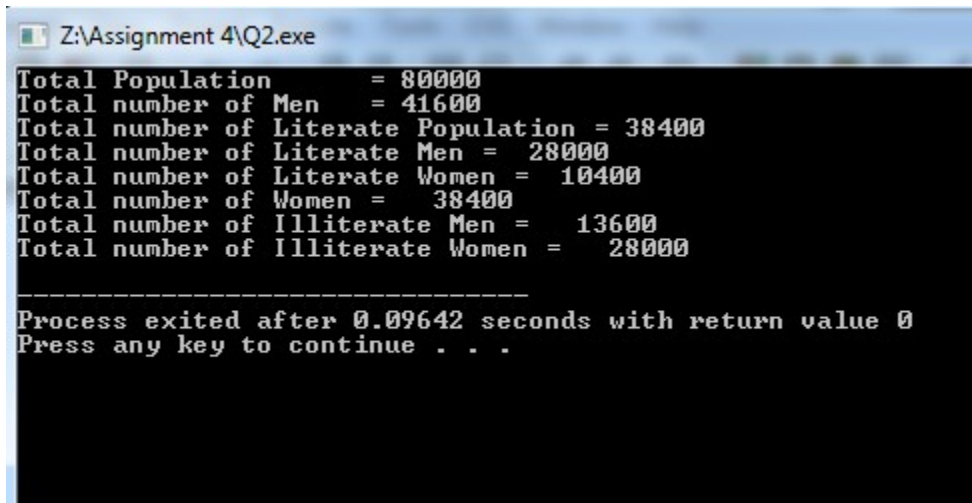
```
int main()
```

```

{
    int per_men, tot_men, tot_lit_pop, tot_lit_per;
    int men_lit_per, tot_lit_men, tot_lit_wom;
    int tot_wom, ilt_wom, ilt_men, tot_pop=80000;
        per_men=52;
        tot_men=tot_pop*per_men/100;
        tot_lit_per=48;
        tot_lit_pop=tot_pop*tot_lit_per/100;
        men_lit_per=35;
        tot_lit_men=tot_pop*men_lit_per/100;
        tot_lit_wom=tot_lit_pop-tot_lit_men;
        tot_wom=tot_pop-tot_men;
        ilt_men=tot_men-tot_lit_men;
        ilt_wom=tot_wom-tot_lit_wom;

        cout<<"Total Population    = "<<tot_pop<<endl;
        cout<<"Total number of Men    = "<<tot_men<<endl;
        cout<<"Total number of Literate Population = "<<tot_lit_pop<<endl;
        cout<<"Total number of Literate Men = "<<tot_lit_men<<endl;
        cout<<"Total number of Literate Women = "<<tot_lit_wom<<endl;
        cout<<"Total number of Women = "<<tot_wom<<endl;
        cout<<"Total number of Illiterate Men = "<<ilt_men<<endl;
        cout<<"Total number of Illiterate Women = "<<ilt_wom<<endl;
        return 0;
}

```



```

Z:\Assignment 4\Q2.exe
Total Population    = 80000
Total number of Men    = 41600
Total number of Literate Population = 38400
Total number of Literate Men = 28000
Total number of Literate Women = 10400
Total number of Women = 38400
Total number of Illiterate Men = 13600
Total number of Illiterate Women = 28000

-----
Process exited after 0.09642 seconds with return value 0
Press any key to continue . . .

```

Q3) /*If the total selling price of 15 items and the total profit earned on them is input through the keyboard. Write a program to find the cost price of one item.

*/

```

#include<iostream>
using namespace std;

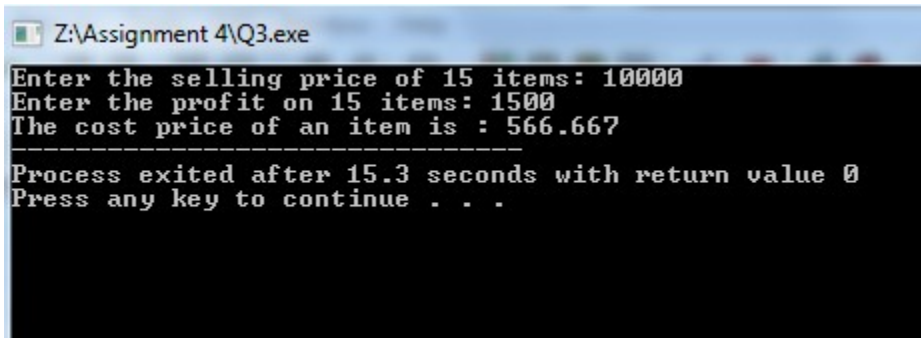
int main()
{
    float s, p, c; //s= selling price, p= profit, c= cost price

    cout<<"Enter the selling price of 15 items: ";
    cin>>s;
    cout<<"Enter the profit on 15 items: ";
    cin>>p;

    //code to calculate cost of an item 'cost price = (selling price - profit)/15'
    c = (s-p)/15;

    cout<<"The cost price of an item is : " << c;
    return 0;
}

```



```

Z:\Assignment 4\Q3.exe
Enter the selling price of 15 items: 10000
Enter the profit on 15 items: 1500
The cost price of an item is : 566.667
-----
Process exited after 15.3 seconds with return value 0
Press any key to continue . . .

```

Q4) /* If a five-digit number is input through the keyboard, write a program to print a new number by adding one to each of its digits. For example, if the number that is input is 12391, then the output should be displayed as 23502.
*/

```

#include<iostream>
using namespace std;

int main()
{
    int num, sum, i, number, count=0, n=1;

    cout<<"Enter N Digit's Number: ";

```

```

cin>>num;

number = num;

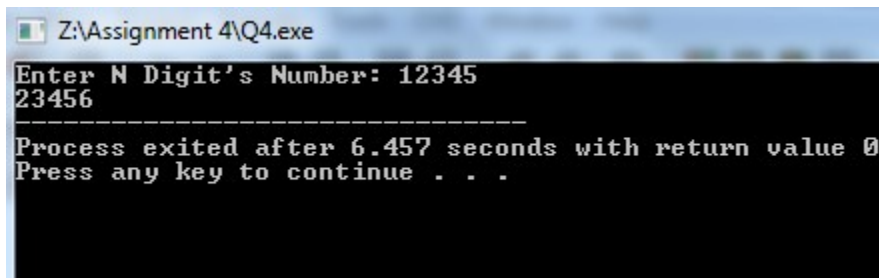
//get the counter till then we have to run the loop

while(number!=0)
{
    number = number/10;
    count = count + 1;
}

for(i=1;i<count;i++)
{
    n = n * 10; //n = 10
    n = n + 1; //n = 11
}

sum = num + n;
cout<<sum;
}

```



```

Z:\Assignment 4\Q4.exe
Enter N Digit's Number: 12345
23456
-----
Process exited after 6.457 seconds with return value 0
Press any key to continue . . .

```

Q5) //

```

#include<iostream>
using namespace std;
int main()
{
    float cp,sp,profit,loss;
    cout<<"Enter the cost price:: ";
    cin>>cp;
    cout<<"Enter the selling price:: ";
    cin>>sp;

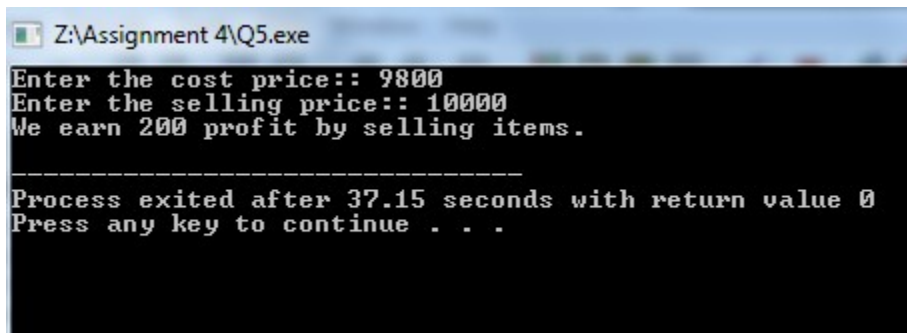
    if(sp>cp)
    {
        profit=sp-cp;
        cout<<"We earn "<<profit<<" profit by selling items."<<endl;
    }
}

```

```

    }
    else if(sp<cp)
    {
        loss=cp-sp;
        cout<<"We incurred "<<loss<<" loss on selling items."<<endl;
    }
    else
        cout<<"We dont get any loss and profit on selling item.";
}
}

```



```

Z:\Assignment 4\Q5.exe
Enter the cost price:: 9800
Enter the selling price:: 10000
We earn 200 profit by selling items.

-----
Process exited after 37.15 seconds with return value 0
Press any key to continue . . .

```

Q6) //A five digit number is entered through the keyboard

```

#include<iostream>
using namespace std;

int main()
{
    int num,a,b,c,d,e,x;

    cout<<"Enter a five digit number : ";
    cin>>num;

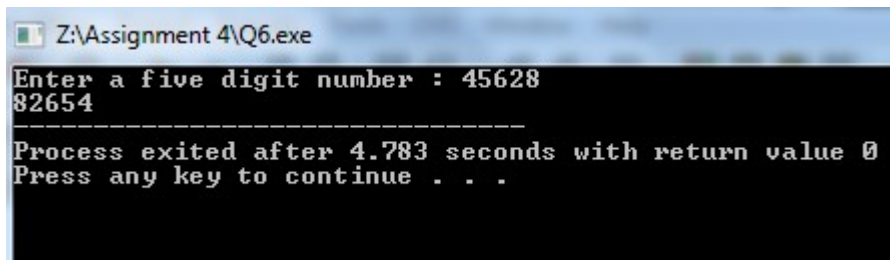
    //separating digits of the number
    e = num % 10;
    d = (num/10) % 10;
    c = (num/100) % 10;
    b = (num/1000) % 10;
    a = (num/10000);

    //reversing the number
    x = e*10000 + d*1000 + c*100 + b*10 + a;
    cout<<x;

    if(x == num)
        cout<<"The reverse of the number %d is same as actual number."<<num;
}

```

```
    return 0;
}
```



```
Z:\Assignment 4\Q6.exe
Enter a five digit number : 45628
82654
-----
Process exited after 4.783 seconds with return value 0
Press any key to continue . . .
```

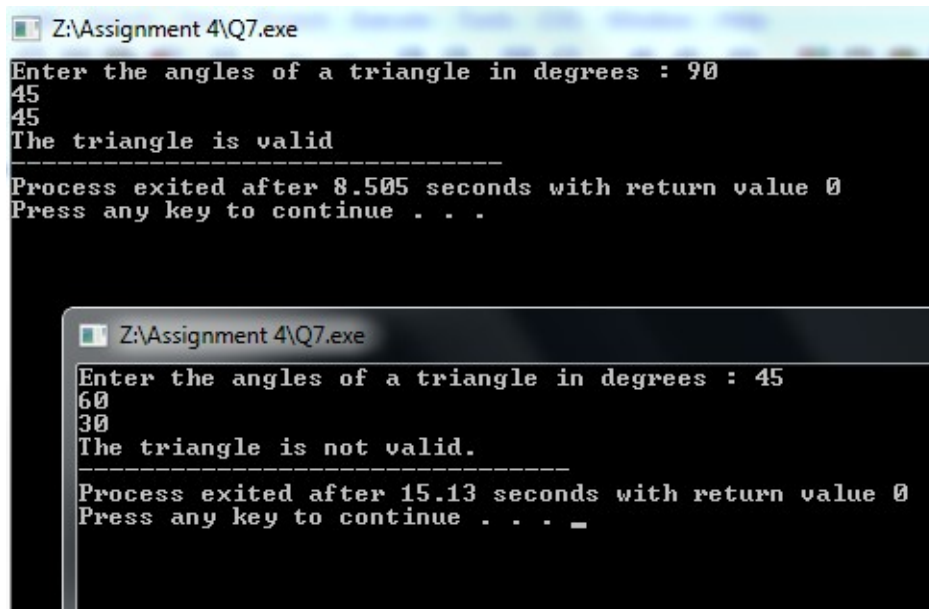
Q7) /* Write a program to check whether a triangle is valid or not, when the three angles of the triangle are entered through the keyboard. A triangle is valid if the sum of all the three angles is equal to 180 degrees. */

```
#include<iostream>
using namespace std;
int main()
{
    int a,b,c;

    cout<<"Enter the angles of a triangle in degrees : ";
    cin>>a>>b>>c;

    if(a+b+c == 180)
        cout<<"The triangle is valid";
    else
        cout<<"The triangle is not valid.";

    return 0;
}
```



```
Z:\Assignment 4\Q7.exe
Enter the angles of a triangle in degrees : 90
45
45
The triangle is valid
-----
Process exited after 8.505 seconds with return value 0
Press any key to continue . . .

Z:\Assignment 4\Q7.exe
Enter the angles of a triangle in degrees : 45
60
30
The triangle is not valid.
-----
Process exited after 15.13 seconds with return value 0
Press any key to continue . . . _
```

Q8) /* Given the length and breadth of a rectangle, write a program to find whether the area of the rectangle is greater than its perimeter.
For example, the area of the rectangle with length = 5
and breadth = 4 is greater than its perimeter.
*/

```
#include<iostream>
using namespace std;
int main()
{
    float a,b,area, peri;

    cout<<"Enter the length and breadth of the rectangle : ";
    cin>>a>>b;

    area = a*b;
    peri = 2*a + 2*b;

    if(area > peri)
        cout<<"The area "<<area<<" of the rectangle is greater than it's
perimeter "<<peri;
    else
        cout<<"The area "<<area<<" of the rectangle is less than it's perimeter
"<<peri;

    return 0;
}
```

```
Z:\Assignment 4\Q8.exe
Enter the length and breadth of the rectangle : 45
68
The area 3060 of the rectangle is greater than it's perimenter 226
-----
Process exited after 6.497 seconds with return value 0
Press any key to continue . . .
```

Q9) /* Given three points (x1, y1), (x2, y2) and (x3, y3),
write a program to check if all the three points fall on one straight line.
*/

```
#include<iostream>
using namespace std;
int main()
{
    int x1,x2,x3,y1,y2,y3,ar;

    cout<<"Enter x-y coordinates of first point : ";
    cin>>x1>>y1;

    cout<<"\nEnter x-y coordinates of second point : ";
    cin>>x2>>y2;

    cout<<"\nEnter x-y coordinates of third point : ";
    cin>>x3>>y3;

    ar= (x1*(y2-y3) + x2*(y3-y1) + x3*(y1-y2));//condition for collinear

    if(!ar)
        cout<<"The points are collinear.";
    else
        cout<<"The points are not collinear.";

    //To check there's is an example (0, -2) , (2, 4) and (-1, -5).

    return 0;
}
```



```
Z:\Assignment 4\Q9.exe
Enter x-y coordinates of first point : 1
5
Enter x-y coordinates of second point : 1
9
Enter x-y coordinates of third point : 1
6
The points are collinear.
-----
Process exited after 15.77 seconds with return value 0
Press any key to continue . . .

Z:\Assignment 4\Q9.exe
Enter x-y coordinates of first point : 1
2
Enter x-y coordinates of second point : 2
1
Enter x-y coordinates of third point : 3
5
The points are not collinear.
-----
Process exited after 14.76 seconds with return value 0
Press any key to continue . . .
```

Q10) /* Given the coordinates (x, y) of a center of a circle and it's radius, write a program which will determine whether a point lies inside the circle, on the circle or outside the circle.
*/

```
#include<iostream>
#include<cmath>
using namespace std;
int main()
{
    float r,x,y;

    cout<<"Enter the radius of the circle : ";
    cin>>r;

    cout<<" Enter the x-y coordinates of the point for checking it's position : ";
    cin>>x>>y;

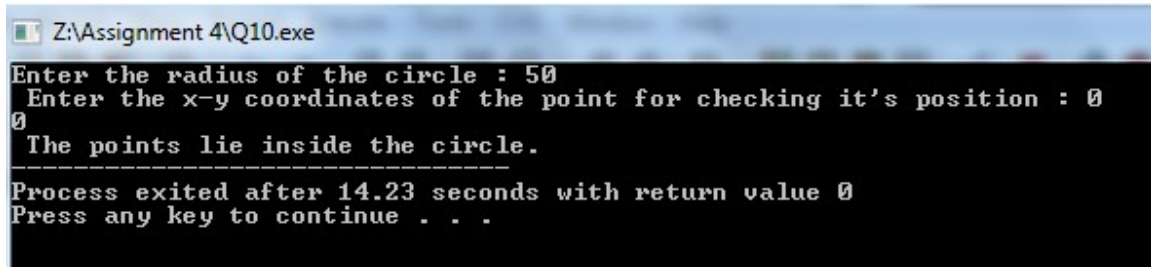
    if(r > sqrt(pow(x,2) + pow(y,2)))
        cout<<" The points lie inside the circle.";
    else if(r == sqrt(pow(x,2) + pow(y,2)))
        cout<<" The points lie on the circle.";
    else
```

```

        cout<<"The points lie outside the circle.";

    return 0;
}

```



```

Z:\Assignment 4\Q10.exe
Enter the radius of the circle : 50
Enter the x-y coordinates of the point for checking it's position : 0
0
The points lie inside the circle.
-----
Process exited after 14.23 seconds with return value 0
Press any key to continue . . .

```

Q11) CALENDAR

```

#include <iostream>
#include <cstdlib>
#include <iomanip>

using namespace std;

void skip (int i)
{
    while (i > 0)
    {
        cout << " ";
        i = i - 1;
    }
}

void error ()
{
    cout << "\nError. End procedure." << "\n";
    exit ( -1);
}

bool leap_year (int year)
{
    return ((year%4==0) && (year%100 !=0))||(year%400==0) ;
}

int start_day(int year)
{

```

```

int day_start;
int x1, x2, x3;
x1 = (year - 1)/ 4;
x2 = (year - 1)/ 100;
x3 = (year - 1)/ 400;
day_start = (year + x1 - x2 + x3) %7;
return day_start;
}

```

```

int number_days_month (int m, bool leap)
{
    if (m == 1) return(31);
    else if (m == 2) if (leap) return(29);else return(28);
    else if (m == 3) return(31);
    else if (m == 4) return(30);
    else if (m == 5) return(31);
    else if (m == 6) return(30);
    else if (m == 7) return(31);
    else if (m == 8) return(31);
    else if (m == 9) return(30);
    else if (m == 10) return(31);
    else if (m == 11) return(30);
    else if (m == 12) return(31);
    else error();
}

```

```

void print_month_name (int m)
{
    if (m == 1)
    {
        skip(7);
        cout << "January" << "\n";
    }
    else if (m == 2) { skip(7); cout << "February" << "\n"; }
    else if (m == 3) { skip(7); cout << "March" << "\n"; }
    else if (m == 4) { skip(7); cout << "April" << "\n"; }
    else if (m == 5) { skip(7); cout << "May" << "\n"; }
    else if (m == 6) { skip(7); cout << "June" << "\n"; }
    else if (m == 7) { skip(7); cout << "July" << "\n"; }
    else if (m == 8) { skip(7); cout << "August" << "\n"; }
    else if (m == 9) { skip(7); cout << "September" << "\n"; }
    else if (m == 10) { skip(7); cout << "October" << "\n"; }
    else if (m == 11) { skip(7); cout << "November" << "\n"; }
    else if (m == 12) { skip(7); cout << "December" << "\n"; }
    else error();
}

```

```

    cout << " S M T W T F S" << "\n";
    cout << " _____ " << "\n";
}

```

```

void print_month (int number_days, int &weekDay)
{
    int day = 1;

    while (day <= number_days)
    {
        cout << setw(2) << day << " ";
        if (weekDay == 6)
        {
            cout << "\n";
            weekDay = 0;
        }
        else weekDay = weekDay + 1;
        day = day + 1;
    }
}

```

```

int main ()
{

    int year, start_day_month, number_days, current_month = 1;
    bool leap;

    cout << "Enter the year : ";
    cin >> year;
    cout << "\n";

    start_day_month = start_day(year);
    leap = leap_year(year);
    skip(9);

    cout << year << "\n";

    while (current_month <= 12)
    {
        number_days = number_days_month(current_month, leap);
        print_month_name(current_month);
        print_month(number_days, start_day_month);
    }
}

```

```

cout << "\n\n";
current_month = current_month + 1;
}
cout << "\n";
}

```

Z:\Assignment 4\Q11 Printing Calendar for a given year.exe

Enter the year : 2016\

2016						
January						
S	M	T	W	T	F	S
1	2					
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

February						
S	M	T	W	T	F	S
1	2	3	4	5	6	
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29					

March						
S	M	T	W	T	F	S
1	2	3	4	5		
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

April						
S	M	T	W	T	F	S
1	2					
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

May						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Z:\Assignment 4\Q11 Printing Calendar for a given year.exe

June						
S	M	T	W	T	F	S
1	2	3	4			
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

July						
S	M	T	W	T	F	S
1	2					
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

August						
S	M	T	W	T	F	S
1	2	3	4	5	6	
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

September						
S	M	T	W	T	F	S
1	2	3				
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

October						
S	M	T	W	T	F	S
1						
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

```

Z:\Assignment 4\Q11 Printing Calendar for a given year.exe
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31

      September
S  M  T  W  T  F  S
-----
1  2  3
4  5  6  7  8  9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30

      October
S  M  T  W  T  F  S
-----
1
2  3  4  5  6  7  8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31

      November
S  M  T  W  T  F  S
-----
1  2  3  4  5
6  7  8  9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30

      December
S  M  T  W  T  F  S
-----
1  2  3
4  5  6  7  8  9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31

```

Q12) /*In a class there are n number of students – each studying m subjects.
Marks of each of the student in each of the subjects are to be read and class average
in each subject and the average of total marks in all subjects to be computed.
There is no need to store the values – No need to use arrays – Assume that m is 3
and
use sentinel -100 to end inputs. Output marks in each subject and total obtained by each
student
in a row and subject average and class average in the last row.*/

```

#include<iostream>
using namespace std;

int Average(int, int);

int main(){
    int n, m;
    cout<<" Enter the Number of Students in class : ";
    cin>>n;
    m=3;
    // cout<<"Please Enter the Number Subjects : ";
    // cin>>m;
    Average(n,m);
    return 0;

}

int Average(int a, int b){
    int i, j;
    float S1,S2,S3,sub1Sum=0,sub2Sum=0,sub3Sum=0;
    for(i=1;i<=a;i++){
        cout<<"Please Enter marks of Student- "<<i<<" in All "<<b<<" Subjects
"<<endl;
        for(j=1;j<=b;j++){
            if(j==1){
                cin>>S1;
                sub1Sum += S1;
            }
            if(j==2){
                cin>>S2;
                sub2Sum += S2;
            }
            if(j==3){
                cin>>S3;
                sub3Sum += S3;
            }
        }
        cout<<"Average Of Student- "<<i<<" Marks
="<<(S1+S2+S3)/3<<endl<<endl;
    }
    cout<<"Average Of Subject-1 = "<<sub1Sum/a<<endl;
    cout<<"Average Of Subject-2 = "<<sub2Sum/a<<endl;
    cout<<"Average Of Subject-3 = "<<sub3Sum/a<<endl;
    cout<<"Average Of All Three Subjects =
"<<(sub1Sum+sub2Sum+sub3Sum)/(3*a);

```

```

    return 0;
}

```

```

Z:\Assignment 4\Q12.exe
Enter the Number of Students in class : 3
Please Enter marks of Student- 1 in All 3 Subjects
75 48 68
Average Of Student- 1 Marks =63.6667

Please Enter marks of Student- 2 in All 3 Subjects
87 68 98
Average Of Student- 2 Marks =84.3333

Please Enter marks of Student- 3 in All 3 Subjects
99 79 87
Average Of Student- 3 Marks =88.3333

Average Of Subject-1 = 87
Average Of Subject-2 = 65
Average Of Subject-3 = 84.3333
Average Of All Three Subjects = 78.7778
-----
Process exited after 35.11 seconds with return value 0
Press any key to continue . . .

```

Q13) /*

Write a function to take a floating point number as input and returns the same number

rounded to k decimal places. Do not use any system defined functions.

If input is 17.24578, and k = 2, the output is 17.25 and 345.2034 is rounded as 345.20.

*/

```

#include<iostream>
using namespace std;

```

```

int main()
{
    long double num,num1;
    int n,i = 0,p = 1,numc;
    cout << "Please enter a Floating Number : ";
    cin >> num;
    cout << "Please enter the decimal places you want to print : ";
    cin >> n; //17.6254
    while(i <= n)
    {
        num *= 10; //17625.4
        i++;
        p *= 10; //1000
    }
}

```

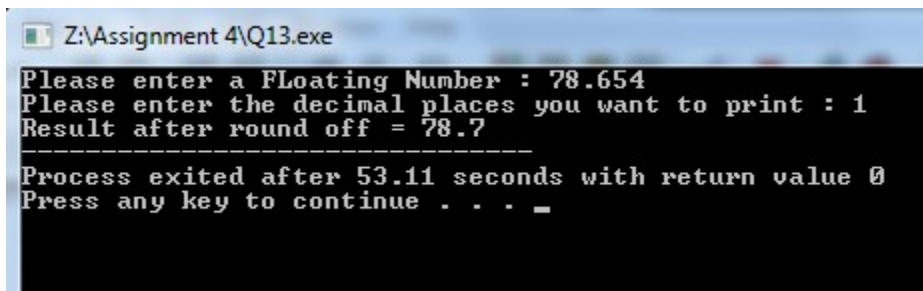


```

}
p/=10; // 100
numc = num; //17625
if(numc % 10 >= 5)
{
numc += (10-(numc % 10)); //17630
}
cout<<"Result after round off = ";
cout << (float)((float)(numc/10)/p);

}

```



```

Z:\Assignment 4\Q13.exe
Please enter a Floating Number : 78.654
Please enter the decimal places you want to print : 1
Result after round off = 78.7
-----
Process exited after 53.11 seconds with return value 0
Press any key to continue . . . _

```

Q14) /*
 Use functions to write a program to implement integer calculator with functions
 add, subtract, multiply, quotient, modulus, exponent.
 Provide proper user interface.
 */

```

#include<iostream>
#include<math.h>
using namespace std;

```

```

void add();
void subtract();
void multiply();
void quotient();
void modulus1();
void exponent();

```

```

int num1, num2;

```

```

int main(){
    char operation;
    cout<<"Please Choose which operation you want to Perform : "<<endl;

```

```

cout<<"\t\t|Enter + to perform Addition      |"<<endl;
cout<<"\t\t|Enter - to perform Subtraction   |"<<endl;
cout<<"\t\t|Enter * to perform Multiplication |"<<endl;
cout<<"\t\t|Enter / to perform Division      |"<<endl;
cout<<"\t\t|Enter % to perform Modulus       |"<<endl;
cout<<"\t\t|Enter ^ to perform Exponent      |"<<endl;

```

m:

```

cout<<"\n\n\t\tPlease Enter the Operation You want to Perform : ";

```

```

cin>>operation;

```

```

switch(operation){
    case '+':
    {
        add();
        break;
    }
    case '-':
    {
        subtract();
        break;
    }
    case '*':
    {
        multiply();
        break;
    }
    case '/':
    {
        quotient();
        break;
    }
    case '%':
    {
        modulus1();
        break;
    }
    case '^':
    {
        exponent();
        break;
    }
    default :
    {
        cout<<"\n\n\t\tPlease Enter the Valid Operation "<<endl;
    }
}

```

```

        goto m;
    }
}
return 0;
}

void add(){
    cout<<"\t\tPlease Enter the First Number : ";
    cin>>num1;
    cout<<"\t\tPlease Enter the Second Number : ";
    cin>>num2;
    cout<<"\t\tSum of First and Second Number : "<<num1+num2;
}

void subtract(){
    cout<<"\t\tPlease Enter the First Number : ";
    cin>>num1;
    cout<<"\t\tPlease Enter the Second Number : ";
    cin>>num2;
    cout<<"\t\tDifference of First and Second Number : "<<num1-num2;
}

void multiply(){
    cout<<"\t\tPlease Enter the First Number : ";
    cin>>num1;
    cout<<"\t\tPlease Enter the Second Number : ";
    cin>>num2;
    cout<<"\t\tProduct of First and Second Number : "<<num1*num2;
}

void quotient(){
    cout<<"\t\tPlease Enter the First Number : ";
    cin>>num1;
    cout<<"\t\tPlease Enter the Second Number : ";
    cin>>num2;
    cout<<"\t\tDivision of First and Second Number : "<<num1/num2;
}

void modulus1(){
    cout<<"\t\tPlease Enter the First Number : ";
    cin>>num1;
    cout<<"\t\tPlease Enter the Second Number : ";
    cin>>num2;
    cout<<"\t\tModulus of First and Second Number : "<<num1%num2;
}

```

```

void exponent(){
    cout<<"\t\tPlease Enter the Number : ";
    cin>>num1;
    cout<<"\t\tPlease Enter the Exponent : ";
    cin>>num2;
    cout<<"\t\tResult of "<<num1<<"^"<<num2<<" is : "<<pow(num1,num2);
}

```

```

Z:\Assignment 4\Q14 Calculator.exe
Please Choose which operation you want to Perform :
!Enter + to perform Addition
!Enter - to perform Subtraction
!Enter * to perform Multiplication
!Enter / to perform Division
!Enter % to perform Modulus
!Enter ^ to perform Exponent

Please Enter the Operation You want to Perform : +
Please Enter the First Number : 357
Please Enter the Second Number : 159
Sum of First and Second Number : 516
-----
Process exited after 10.22 seconds with return value 0
Press any key to continue . . .

```