Operators, Conditional Statements, Loops, Functions, Arrays, Pointers and Structures

OBJECT ORIENTED PROGRAMMING LAB

ASSIGNMENT # 01

Submitted By

Usama yazdani

(20P-0598)

Submitted to

MR. MUHAMMAD ABDULLAH ORAKZAI

(COMPUTER INSTRUCTOR)

DEPARTMENT OF COMPUTER SCIENCE

FAST NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCINCES, PESHAWAR

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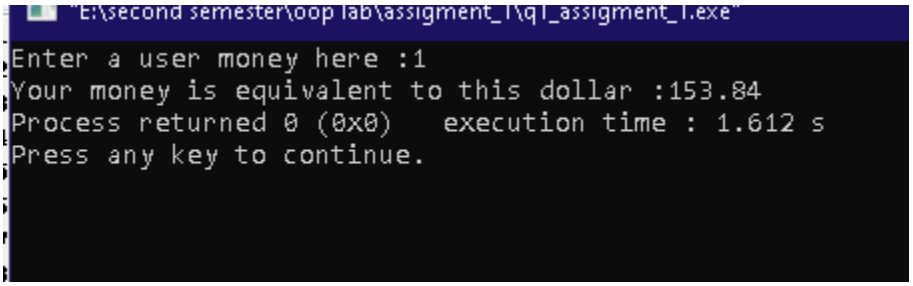
Operators

Write a C++ program that will convert dollar to rupees (Dollar to Rupees Conversion Calculator).

```
#include<iostream>
using namespace std;
int main(){
 double dollar=153.84;
double user;
cout<<"Enter a user money here :";
cin>>user;
dollar=dollar*user;
cout<<"Your money is equivalent to this dollar :"<<dollar;


}
```



Write a C++ program that will convert rupees to dollar (Rupees to Dollar Conversion Calculator).

```cpp
#include<iostream>
using namespace std;
int main(){

double rupees=0.0065;
double user;
cout<<"Enter a user money here :";
cin>>user;
rupees=rupees*user;
cout<<"Your money is equivalent to this dollar :"<<rupees;


}
```

```
"E:\second semester\oop lab\assigment_1\q2_assigment_1.exe"
Enter a user money here :35
Your money is equivalent to this dollar :0.2275
Process returned 0 (0x0)   execution time : 3.240 s
Press any key to continue.
```

Write a C++ program that will convert centigrade to Fahrenheit.

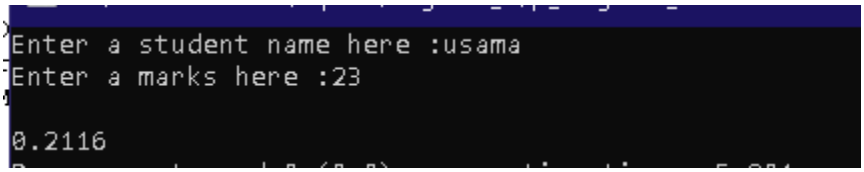
```cpp
#include<iostream>
using namespace std;
int main(){
double celcuis,farahenheit;
cout<<"Enter a celcuis temperature  here ";cin>>celcuis;
farahenheit=(celcuis*(9/5))+32;
cout<<"farahenheit temperature "<<farahenheit;

}
```

```
Enter a celcuis temperature  here 34
farahenheit temperature 66
Process returned 0 (0x0)   execution time : 4.465 s
Press any key to continue.
```

Take student name and marks of your 2nd semester from user and then generate DMC

which will contain obtained marks out of total and percentage.

```cpp
#include<iostream>
using namespace std;
int main(){
string name;
cout<<"Enter a student name here :";cin>>name;
double marks,total_marks=500;
cout<<"Enter a marks here :";cin>>marks;cout<<endl;
double percentage;
percentage=(marks/total_marks)*100;
double DMC;
DMC=(marks/total_marks)*percentage;
cout<<DMC;



}
```



In lab manual 2.3 math functions (Other Math Functions) are listed in the form of table

you all are directed to implement all these functions using C++ program.

```cpp
#include<iostream>
#include<cmath>
using namespace std;
int main(){
double user,result,result2;
cout<<"Enter a value here : ";cin>>user;
result=sin(user);
result2=sinh(user);
double xDegrees = 90.0;

// converting degrees to radians
user = xDegrees*3.14159/180;
result = sin(user);
result2=sinh(user);
long double result3,result4;
result3 = tan(user);
result4=tanh(user);
cout<<"For sin "<<result<<endl;;
cout<<"for sin heyperbola :" <<result2;

double xDegreest = 60.0;
// converting degree to radians and using tan() fucntion
result3 = tan(xDegreest*3.14159/180);
result4 = tan(xDegreest*3.14159/180);
cout <<endl <<"tan(user) = " << result3 << endl;
cout <<"tanh(user) = " << result4 << endl;

}
```

```
Enter a value here : 190
For sin 1
for sin heyperbola :2.3013
tan(user) = 1.73205
tanh(user) = 1.73205
```

Conditional Statements

Find positive and negative numbers using if else statement.

```cpp
#include<iostream>
using namespace std;
int main(){
long user;
cout<<"enter a user number";
cin>>user;
if(user>0){
    cout<<"This number is positive";
}else
    cout<<"This is negative number";


}
```

```
enter a user number3
This number is positive
Process returned 0 (0x0)   execution time : 2.699 s
Press any key to continue.
```

Find even and odd numbers using if else statement.

```cpp
#include<iostream>
using namespace std;
int main(){
long user;
cout<<"enter a user number";
cin>>user;
if(user%2==0){
    cout<<"This number is even";
}else
    cout<<"This is odd number";


}
```

```
enter a user number3
This is odd number
Process returned 0 (0x0)   execution time : 2.513 s
Press any key to continue.
```

Find leap year using if else statement.

```cpp
#include<iostream>
using namespace std;
int main(){
long year;
cout<<"enter a user number";
cin>>year;
if (year % 4 == 0) {
        if (year % 100 == 0) {
            if (year % 400 == 0)
                cout << year << " is a leap year.";
            else
                cout << year << " is not a leap year.";
        }
        else
            cout << year << " is a leap year.";
    }
    else
        cout << year << " is not a leap year.";


}
```

```
enter a user number2002
2002 is not a leap year.
Process returned 0 (0x0)   execution time : 2.712 s
Press any key to continue.
```

Write a C++ program which will get two numbers from user and find large number

between them using if else statement.

```cpp
#include<iostream>
using namespace std;
int main(){
int number1,number2;
cout<<"Enter a number here"<<endl;
cin>>number1>>number2;
if(number1>number2){
    cout<<"Number 1 is greater then number 2";
}else
    cout<<"Number 2 is greater then number 1";
}
```

```
Enter a number here
3
4
Number 2 is greater then number 1
Process returned 0 (0x0)   execution time : 3.
```

if-else-if else

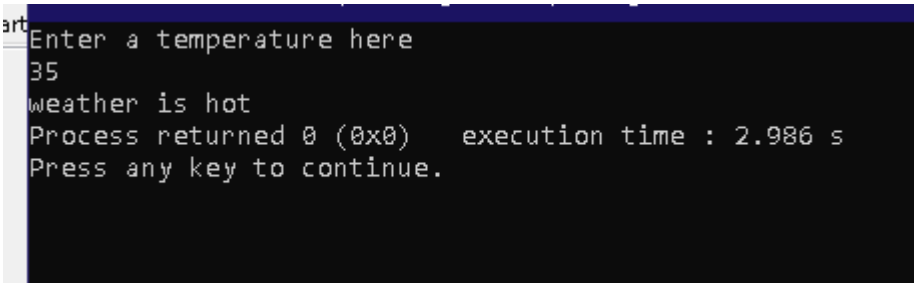
Find positive, negative and neutral numbers using if-else-if else statement.

```cpp
#include<iostream>
using namespace std;
int main(){
int number;
cout<<"Enter a number here"<<endl;
cin>>number;
if(number>0){
    cout<<"number is positive";
}else if(number<0){
    cout<<"number is negative";

}else if(number==0){
    cout<<"Number is neutral"; }


}
```

```
Enter a number here
-2
number is negative
Process returned 0 (0x0)   execution time : 4.172 s
Press any key to continue.
```

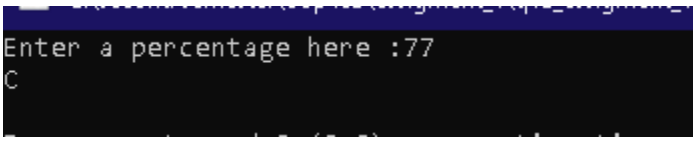
Take value of temperature from user and find status of weather accordingly.

```cpp
#include<iostream>
using namespace std;
int main(){
double temprature ;
cout<<"Enter a number here"<<endl;
cin>>temprature;
 if(temprature>=10.0){
    cout<<"weather is hot";
 }else if(temprature>=0.0 && temprature<=10.0){

 cout<<"Normal weather";
 }else if(temprature<0.0){
 cout<<"weather is cold";
 }


}
```



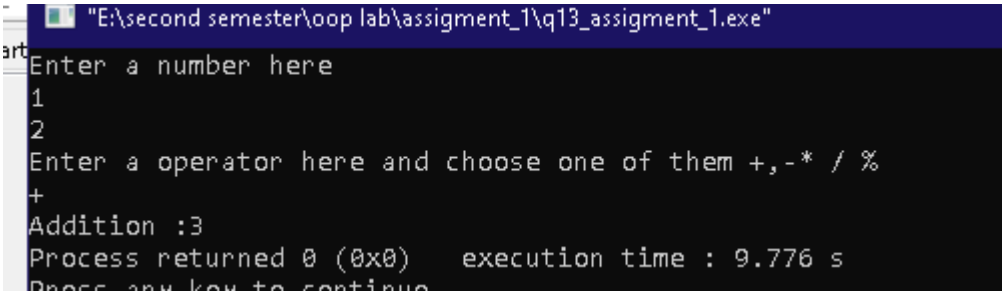
Take value of percentage from user and find grades based on percentage value.

```cpp
#include<iostream>
using namespace std;
int main(){

double percentage;
cout<<"Enter a percentage here :";cin>>percentage;

if (percentage>90.0 && percentage<100){
    cout<<"A"<<endl;
}else  if (percentage>=80.0&&percentage<=89.99){
    cout<<"B"<<endl;
}else  if (percentage>=70.0 &&percentage<=79.99){
    cout<<"C"<<endl;
}else if (percentage>=60.0 &&percentage<=69.99){
    cout<<"D"<<endl;
} else if (percentage>=0.0 &&percentage<=59.99){
    cout<<"F"<<endl;
}}
```



Make a calculator using if-else-if else statement which perform the addition, subtraction, multiplication, division and remainder operations. Take values and operator from user on runtime.

```cpp
#include<iostream>
using namespace std;
int main(){
long number1,number2,result;
cout<<"Enter a number here"<<endl;
cin>>number1>>number2;
string op;
cout<<"Enter a operator here and choose one of them +,-* / %"<<endl;
cin>>op;
if(op=="+"){
    result=number1+number2;
    cout<<"Addition :"<<result;
}else if(op=="*"){
    result=number1*number2;
    cout<<"Multiplication :"<<result;
}else if(op=="-"){
    result=number1-number2;
    cout<<"subtraction :"<<result;}
    else if(op=="/"){
        result=number1/number2;
    cout<<"Division :"<<result;
    }else if(op=="%"){
    result=number1%number2;
    cout<<"remainder operator :"<<result;
    }



}
```



Conditional Operator (?:)

Write a C++ program which will get two numbers from user and find large number between

them using conditional operator.

```cpp
#include<iostream>
using namespace std;
int main(){
long number1,number2,result;
cout<<"Enter a number here"<<endl;
cin>>number1>>number2;
result=(number1>number2)? number1:number2;
cout<<"This number is greater :"<<result;



}
```

```
Enter a number here
34
32
This number is greater :34
Process returned 0 (0x0)   execution ti
```

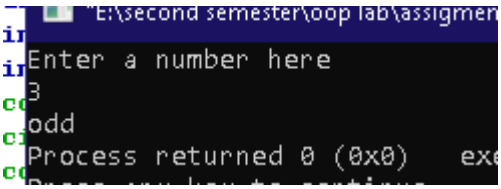
Find positive and negative numbers using conditional operator.

```cpp
#include<iostream>
using namespace std;
int main(){
int number;
cout<<"Enter a number here"<<endl;

cin>>number;
cout<<((number>0)?"positive":"negative");



}
```

```
Enter a number here
3
positive
Process returned 0 (0x0)   executior
Press any key to continue.
```

Find even and odd numbers using conditional operator.

```cpp
#include<iostream>
using namespace std;
int main(){
int number;
cout<<"Enter a number here"<<endl;
cin>>number;
cout<<((number%2==0)?"even":"odd");


}
```



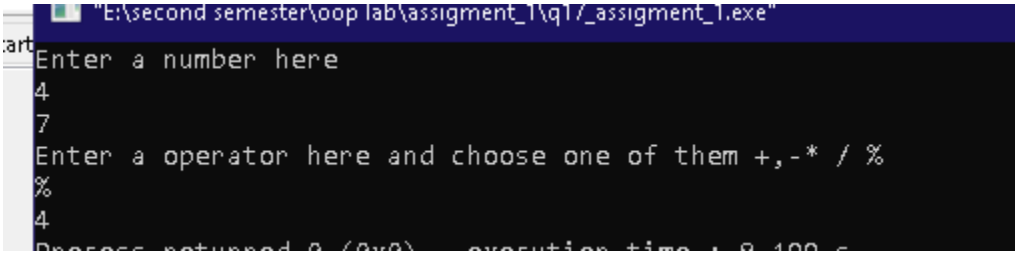
Switch Statement

Make a C++ calculator using switch statement which perform the following addition,

subtraction, multiplication, division and remainder value. Take value and operator from

user on runtime.

```cpp
#include<iostream>
using namespace std;
int main(){
long number1,number2,result;
cout<<"Enter a number here"<<endl;
cin>>number1>>number2;
char op;
cout<<"Enter a operator here and choose one of them +,-* / %"<<endl;
cin>>op;
switch(op){
case '+':
    result=number1+number2;
    cout<<result;
    break;

case '-':
    result=number1-number2;
    cout<<result;
    break;
case '*':
    result=number1*number2;
    cout<<result;
    break;
case '/':
    result=number1/number2;
    cout<<result;
    break;
case '%':
    result=number1%number2;
    cout<<result;
    break;

}
```



Write a C++ program using switch statement which get month name from user and

display month number accordingly.

```cpp
#include<iostream>
using namespace std;
int main(){
int month;
cout<<"Enter a month name here"<<endl;
cin>>month;
switch(month){
case 1:
    cout<<"januarary";
    break;
case 2:
    cout<<"feburary";
    break;
case 3:
    cout<<"march";
    break;
case 4:
    cout<<"april";
    break;
case 5:
    cout<<"may";
    break;
case 6:
    cout<<"june";
    break;
case 7:
    cout<<"july";
    break;
case 8:
    cout<<"august";
    break;
case 9:
    cout<<"september";
    break;
    break;
case 10:
    cout<<"october";
    break;
case 11:
    cout<<"november";
    break;
case 12:
    cout<<"december";
    break;
default:
    cout<<"invalid value";
    break;}}
```

```
Enter a month name here
5
may
Process returned 0 (0x0)   execution time : 3.954 s
```

Loops

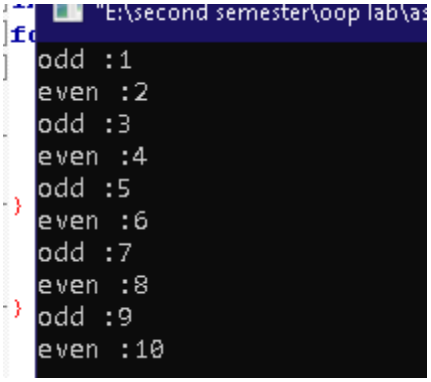
for loop

Write a C++ program which display first 10 number using for loop.

```cpp
#include<iostream>
using namespace std;
int main(){
for(int i=1; i<11; i++){
    cout<<i<<endl;
}


}
```

Write a C++ program which display even and odd number using for loop.

```cpp
#include<iostream>
using namespace std;
int main(){
for(int i=1; i<11; i++){
    if(i%2==0){
        cout<<"even :"<<i<<endl;
    }else
        cout<<"odd :"<<i<<endl;
}


}
```



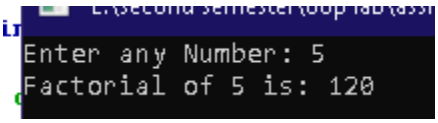
Take a number from user and make a table of that number using for loop.

```
#include<iostream>
using namespace std;
int main(){
int table;
cout<<"Enter a number here"<<endl;cin>>table;
for(int i=1; i<11; i++){
    cout<<table<<" * "<<i<<" = "<<i*table<<endl;
}


}
```

```
Enter a number here
2
2 * 1 = 2
2 * 2 = 4
2 * 3 = 6
2 * 4 = 8
2 * 5 = 10
2 * 6 = 12
2 * 7 = 14
2 * 8 = 16
2 * 9 = 18
2 * 10 = 20
```

Take a number from user and find factorial of that number using for loop.

```cpp
#include<iostream>
using namespace std;
int main(){
int i,fact=1,number;
  cout<<"Enter any Number: ";
 cin>>number;
  for(i=1;i<=number;i++){
      fact=fact*i;
  }
  cout<<"Factorial of " <<number<<" is: "<<fact<<endl;


}
```



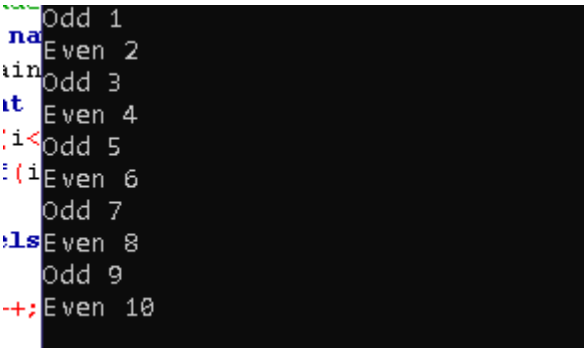
while loop

Write a C++ program which display first 10 number using while loop.

```cpp
#include<iostream>
using namespace std;
int main(){
    int i=1;
while(i<11){
    cout<<i<<endl;
    i++;
}


}
```

Write a C++ program which display even and odd number using while loop.

```cpp
#include<iostream>
using namespace std;
int main(){
    int i=1;
while(i<11){
    if(i%2==0){
        cout<<"Even "<<i<<endl;
    }else
        cout<<"Odd "<<i<<endl;
    i++;
}


}
```



Take a number from user and make a table of that number using while loop.

```cpp
#include<iostream>
using namespace std;
int main(){
    int number;
    cout<<"Enter a number here"<<endl;cin>>number;
    int i=1;
while(i<11){
    cout<<number<<" * "<<i<<" = "<<i*number<<endl;
    i++;
}


}
```

```
Enter a number here
5
5 * 1 = 5
5 * 2 = 10
5 * 3 = 15
5 * 4 = 20
5 * 5 = 25
5 * 6 = 30
5 * 7 = 35
5 * 8 = 40
5 * 9 = 45
5 * 10 = 50
```

Take a number from user and find factorial of that number using while loop.

```cpp
#include<iostream>
using namespace std;
int main(){
    int fact=1,number;
  cout<<"Enter any Number: ";
 cin>>number;
    int i=1;
while(i<=number){
    fact=fact*i;

    i++;
}
  cout<<"Factorial of " <<number<<" is: "<<fact<<endl;


}
```

```
Enter any Number: 5
Factorial of 5 is: 120
```

Make a calculator using if-else-if else statement which perform the addition, subtraction,

multiplication, division and remainder operations. Take values and operator from user on

runtime. Use while loop for user choice. Means after performing one operation program

will ask from user “do you want to do another calculation(yes/no)?”. If user press yesthen

user will enter number 1, number 2 and operator for calculation and if user press no then

terminate the loop.

```cpp
#include<iostream>
using namespace std;
int main(){
int i=1;
while(i<100){
long number1,number2,result;
cout<<"Enter a number here"<<endl;
cin>>number1>>number2;
string op;
cout<<"Enter a operator here and choose one of them +,-* / %"<<endl;
cin>>op;
if(op=="+"){
    result=number1+number2;
    cout<<"Addition :"<<result;
}else if(op=="*"){
    result=number1*number2;
    cout<<"Multiplication :"<<result;
}else if(op=="-"){
    result=number1-number2;
    cout<<"subtraction :"<<result;}
    else if(op=="/"){
        result=number1/number2;
    cout<<"Division :"<<result;
    }else if(op=="%"){
    result=number1%number2;
    cout<<"remainder operator :"<<result;}
cout<<endl;
```

```cpp
cout<<endl;
string user;
cout<<"Do you want to again execute this loop(yes/no)"<<endl;cin>>user;
if(user=="yes")continue;
else if(user=="no")break;
i++;}}
```

```
Enter a number here
5
7
Enter a operator here and choose one of them +,-* / %
*
Multiplication :35
Do you want to again execute this loop(yes/no)
no
```

do while loop

Write a C++ program which display first 10 number using do while loop.

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

int main() {
  int i = 1;
  do {
    cout << i << "\n";
    i++;
  }
  while (i < 11);
  return 0;
}
```

```
1
2
3
4
5
6
7
8
9
10
```

Write a C++ program which display even and odd number using while loop.

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

int main() {
  int i = 1;
  do {
    if(i%2==0){cout<<"Even "<<i<<"\n";}
    else cout<<"Odd "<<i<<endl;
    i++;
  }
  while (i < 11);
  return 0;
}
```

```
Odd 1
Even 2
Odd 3
Even 4
Odd 5
Even 6
Odd 7
Even 8
Odd 9
Even 10
```

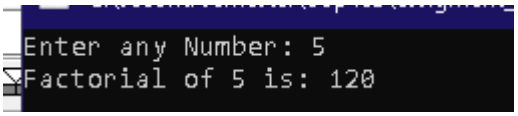
Take a number from user and make a table of that number using do while loop.

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

int main() {
    int table;
    cout<<"Enter a number here"<<endl;cin>>table;
  int i = 1;
  do {
    cout << table<<" * "<<i<<" = "<<i*table<<endl;
    i++;
  }
  while (i < 11);
  return 0;
}
```

```
Enter a number here
3
3 * 1 = 3
3 * 2 = 6
3 * 3 = 9
3 * 4 = 12
3 * 5 = 15
3 * 6 = 18
3 * 7 = 21
3 * 8 = 24
3 * 9 = 27
3 * 10 = 30
```

Take a number from user and find factorial of that number using do while loop.

```cpp
#include<iostream>
using namespace std;
int main(){
    int fact=1,number;
  cout<<"Enter any Number: ";
 cin>>number;
    int i=1;
    do{
    fact=fact*i;

    i++;
}while(i<=number);

  cout<<"Factorial of " <<number<<" is: "<<fact<<endl;



}
```



Make a calculator using if-else-if else statement which perform the addition, subtraction,

multiplication, division and remainder operations. Take values and operator from user on

runtime. Use do while loop for user choice. Means after performing one operation

program will ask from user “do you want to do another calculation(yes/no)? ”. If user

press then user will enter number 1, number 2 and operator for calculation and if user

press no then terminate the loop.

```
#include<iostream>
using namespace std;
int main(){
int i=1;
do{

long number1,number2,result;
cout<<"Enter a number here"<<endl;
cin>>number1>>number2;
string op;
cout<<"Enter a operator here and choose one of them +,-* / %"<<endl;
cin>>op;
if(op=="+"){
    result=number1+number2;
    cout<<"Addition :"<<result;
}else if(op=="*"){
    result=number1*number2;
    cout<<"Multiplication :"<<result;
}else if(op=="-"){
    result=number1-number2;
    cout<<"subtraction :"<<result;}
    else if(op=="/"){
        result=number1/number2;
    cout<<"Division :"<<result;
    }else if(op=="%"){
    result=number1%number2;
    cout<<"remainder operator :"<<result;
    }
```

```
cout<<endl;
string user;
cout<<"Do you want to again execute this loop(yes/no)"<<endl;cin>>user;
if(user=="yes")continue;
else if(user=="no")break;

i++;
}while(i<100);

}
```

```
Enter a number here
5
7
Enter a operator here and choose one of them +,-* / %
*
Multiplication :35
Do you want to again execute this loop(yes/no)
yes
Enter a number here
4
9
Enter a operator here and choose one of them +,-* / %
+
Addition :13
Do you want to again execute this loop(yes/no)
no

Process returned 0 (0x0)   execution time : 32.784 s
Press any key to continue.
```

Nested for loop

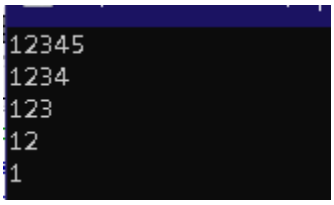
Pattern 1:

```
#include<iostream>
using namespace std;
int main(){
for(int i=0; i<5; i++){
    for(int j=i; j<5; j++ ){
        cout<<"*";
    }cout<<endl;
}


}
```

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

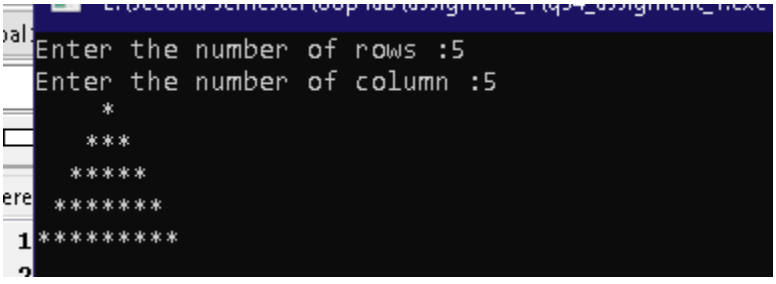
Pattern 2:

```cpp
#include<iostream>
using namespace std;
int main(){

for(int i=5; i>=0; i--){
    for(int j=1; j<=i; j++ ){

        cout<<j;
    }cout<<endl;
}


}
```



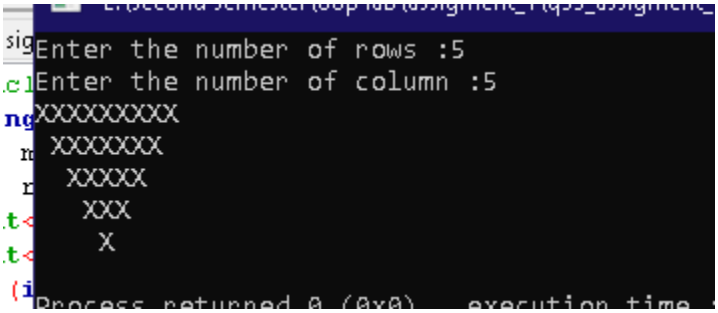
Pattern 3:

```cpp
#include<iostream>
using namespace std;
int main(){
int rows,column;
cout<<"Enter the number of rows :";cin>>rows;
cout<<"Enter the number of column :";cin>>column;
for(int i=1; i<=rows; i++){
    for(int j=1; j<=(rows-i); j++){
        cout<<" ";
    }for(int j=1;  j<=2*i-1; j++){

    cout<<"*";
    }
cout<<endl;}
}
```



Pattern 4:

```cpp
#include<iostream>
using namespace std;
int main(){
int rows,column;
cout<<"Enter the number of rows :";cin>>rows;
cout<<"Enter the number of column :";cin>>column;
for(int i=rows; i>=1; i--){
    for(int j=1; j<=(rows-i); j++){
        cout<<" ";
    }for(int j=1;  j<=2*i-1; j++){

    cout<<"X";
    }
cout<<endl;}
}
```



Arrays

Write a C++ program that will add two single dimensional array elements. Take values

from user at runtime.

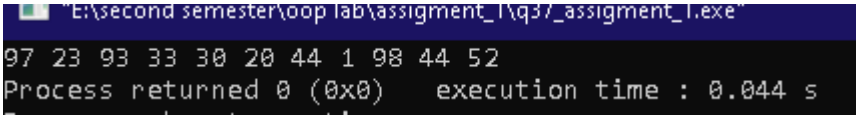
```cpp
#include<iostream>

using namespace std;
int main(){

int arr[5];
int arr2[5];
int output[5];
for(int i=0; i<5; i++ ){cin>>arr[i];}
cout<<"Enter a second element of array"<<endl;
for(int i=0; i<5; i++ ){cin>>arr2[i];}
cout<<"Adding two array"<<endl;
for(int i=0; i<5; i++){
    output[i]=arr[i]+arr2[i];
    cout<<output[i]<<endl;
}

}
```

```
1
2
3
4
5
Enter a second element of array
1
2
3
4
5
Adding two array
2
4
6
8
10
```

How to generate random number in C++, write a simple C++ program that will generate

random number from 1 to 100?

```cpp
#include <iostream>
#include <cstdlib>
#include <ctime>
using namespace std;

int main()
{    int arr[10];
     srand(time(0));

     for (int i = 0; i <= 10; i++)
     {
          arr[i]=rand() % 100;
          cout<<arr[i]<<" ";
     }
}
```



Write a C++ program that will add two single dimensional arrays elements using random

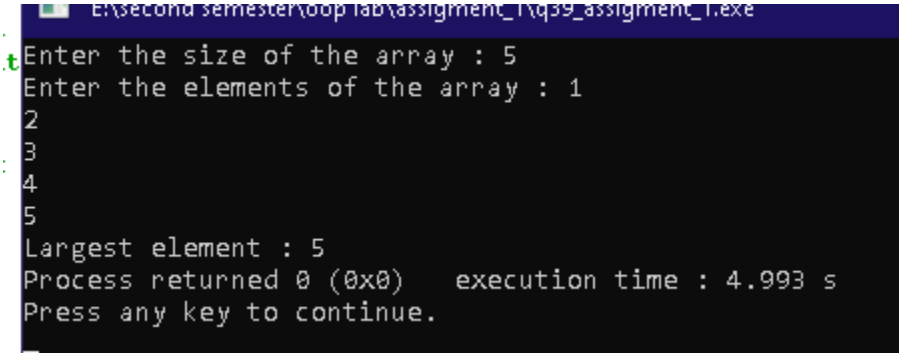
numbers?

```cpp
#include <iostream>
#include <cstdlib>
#include <ctime>
using namespace std;

int main()
{    int arr[10];
     int arr2[10];
     int output[10];
     srand(time(0));

     for (int i = 0; i <= 10; i++)
     {
          arr[i]=rand() % 100;
          cout<<arr[i]<<" ";
     }cout<<endl;
     for (int i = 0; i <= 10; i++)
     {
          arr2[i]=rand() % 100;
          cout<<arr2[i]<<" ";

     }cout<<endl<<"Adding two array"<<endl;
     for(int i=0; i<10; i++){
     output[i]=arr[i]+arr2[i];
     cout<<output[i]<<endl;
}
}
```

```
28 7 64 93 29 49 70 82 1 97 36
92 6 18 71 13 53 33 2 72 65 77
Adding two array
120
13
82
164
42
102
103
84
73
162
```

Write a C++ program that will find maximum number in an array?

```cpp
#include<iostream>
using namespace std;
int main ()
{
    int arr[10], n, i, max;
    cout << "Enter the size of the array : ";
    cin >> n;
    cout << "Enter the elements of the array : ";
    for (i = 0; i < n; i++)
        cin >> arr[i];
    max = arr[0];
    for (i = 0; i < n; i++)
    {
        if (max < arr[i])
            max = arr[i];
    }


    cout << "Largest element : " << max;
}
```



Write a C++ program that will find minimum number in an array?

```cpp
#include<iostream>
using namespace std;
int main ()
{
    int arr[10], n, i, max, min;
    cout << "Enter the size of the array : ";
    cin >> n;
    cout << "Enter the elements of the array : ";
    for (i = 0; i < n; i++)
        cin >> arr[i];

    min = arr[0];
    for (i = 0; i < n; i++)
    {
        if (min > arr[i])
            min = arr[i];
    }
    cout << "smallest element : " << min;
}
```

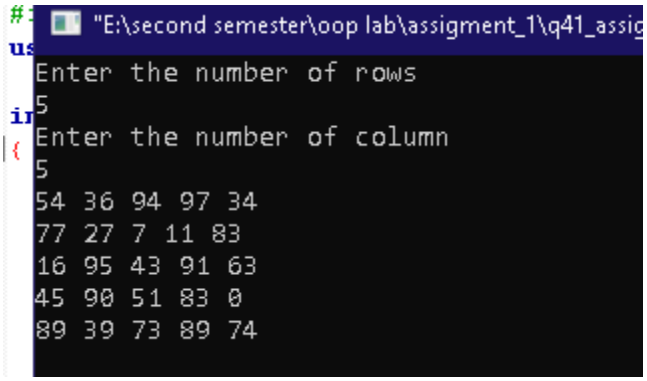
```
Enter the size of the array : 5
Enter the elements of the array : 1
2
3
4
5
smallest element : 1
Process returned 0 (0x0)   execution time : 6.365 s
Press any key to continue.
```

2D Arrays

Write a C++ program that will create 2D array using random numbers and then show

these values.

```cpp
#include <iostream>
#include <cstdlib>
#include <ctime>
using namespace std;

int main()
{    int rows,column;
        cout<<"Enter the number of rows"<<endl;cin>>rows;
        cout<<"Enter the number of column"<<endl;cin>>column;

    int arr[rows][column];
    srand(time(0));

    for (int i = 0; i <rows; i++)
    {for(int j=0; j<column; j++){
        arr[i][j]=rand() % 100;
        cout<<arr[i][j]<<" ";
    }cout<<endl;
    }
}
```



Write a C++ program that will find maximum and minimum number in 2D array. Note

array elements must be random values.

```cpp
#include <iostream>
#include <cstdlib>
#include <ctime>
using namespace std;

int main()
{   int rows,column,min,max;
        cout<<"Enter the number of rows"<<endl;cin>>rows;
        cout<<"Enter the number of column"<<endl;cin>>column;

    int arr[rows][column];
    srand(time(0));

    for (int i = 0; i <rows; i++)
    {for(int j=0; j<column; j++){
        arr[i][j]=rand() % 100;
        cout<<arr[i][j]<<" ";
    }cout<<endl;
    }
    max = arr[0][0];
    min=arr[0][0];
    for (int i = 0; i < rows; i++)
    {for(int j=0; j<column; j++)
        if (max < arr[i][j]){
            max = arr[i][j];}

        else if(min>arr[i][j])


            min=arr[i][j];}
    cout << "Largest element : " << max<<endl;
    cout << "smallest element : " << min;}
```

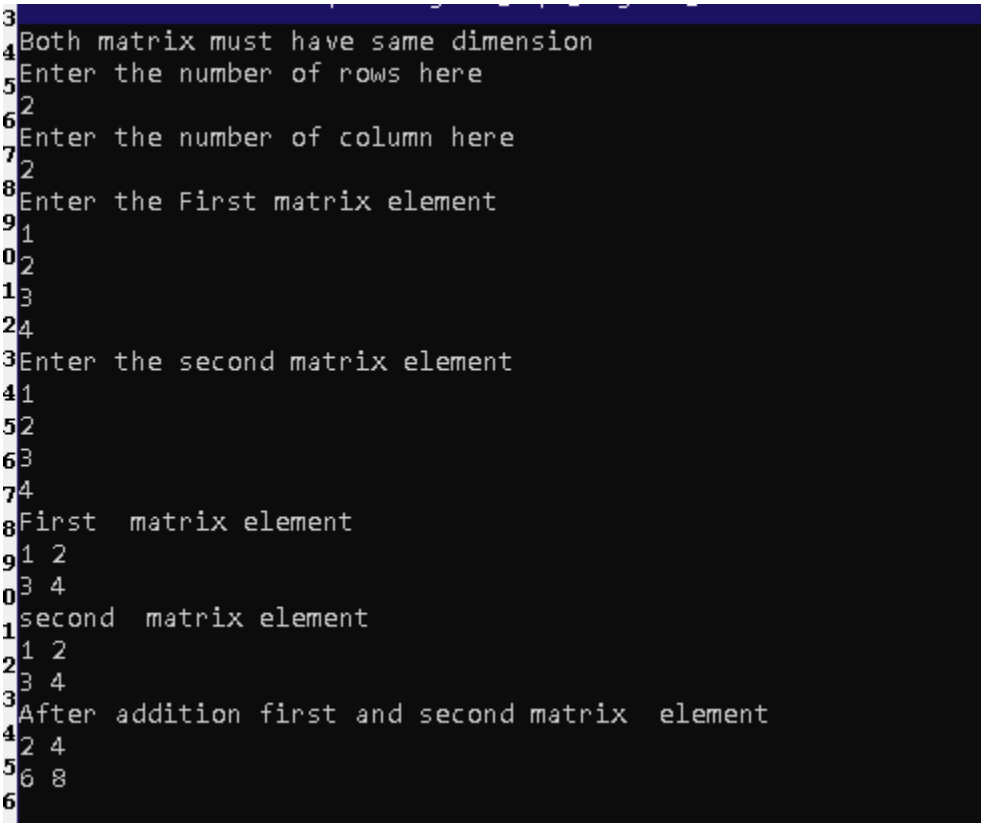
```
Enter the number of rows
5
Enter the number of column
5
96 7 56 41 21
99 55 55 24 28
86 20 65 51 12
5 99 88 1 90
1 37 66 26 58
Largest element : 99
smallest element : 1
Process returned 0 (0x0)   execution time : 2.646 s
```

Write a C++ program that will add two 2D arrays elements. Take values from user at runtime. Note display values of 1st, 2nd and their resultant array.

Hints: A will be the 1st array, B will be the 2nd array and C will be resultant array.

Note: Follow Mathematics Matrix Addition Rules

```
int main(){
int rows, column;
cout<<"Both matrix must have same dimension"<<endl;
cout<<"Enter the number of rows here"<<endl;cin>>rows;
cout<<"Enter the number of column here"<<endl;cin>>column;
int mat1[rows][column],mat2[rows][column],output[rows][column];
cout<<"Enter the First matrix element"<<endl;

for(int i=0; i<rows; i++){
    for(int j=0; j<column; j++){
        cin>>mat1[i][j];
    }
}
cout<<"Enter the second matrix element"<<endl;
for(int i=0; i<rows; i++){
    for(int j=0; j<column; j++){
        cin>>mat2[i][j];
    }
}cout<<"First  matrix element"<<endl;

for(int i=0; i<rows; i++){
    for(int j=0; j<column; j++){
        cout<<mat1[i][j]<<" ";
    }cout<<endl;
}cout<<"second  matrix element"<<endl;
for(int i=0; i<rows; i++){
    for(int j=0; j<column; j++){
        cout<<mat2[i][j]<<" ";
    }cout<<endl;
}cout<<"After addition first and second matrix  element"<<endl;
for(int i=0; i<rows; i++){
    for(int j=0; j<column; j++){
        output[i][j]=mat1[i][j]+mat2[i][j];
        cout<<output[i][j]<<" ";}cout<<endl;})
```



Write a C++ program that will multiply two 2D arrays elements. Take values from user at

runtime. Note display values of 1st, 2nd and their resultant array.

Hints: A will be the 1st array, B will be the 2nd array and C will be resultant array.

Note: Follow Mathematics Matrix Multiplication Rules

```
int main (){
 int rows,column;
 cout<<"enter the number of rows"<<endl;cin>>rows;
 cout<<"enter the number of column"<<endl;cin>>column;
 int A[rows][column],B[rows][column],M[rows][column];
 cout<<"enter the elemnt of first matrix"<<endl;
for(int i=0; i<rows; i++){

    for(int j=0; j<column; j++){
        cin>>A[i][j];
    }
}
 cout<<"enter the elemtn of second matrix"<<endl;
for(int m=0; m<rows; m++){
    for(int n=0; n<column; n++){
        cin>>B[m][n];
    }
}
 int sum=0;
for(int l=0; l<rows; l++){
    for(int p=0; p<column; p++){
                  for(int m=0; m<rows; m++){

        sum=sum+A[l][m]*B[m][p];
  }
  M[l][p]=sum;}}
 cout<<"multiplication of matrix "<<endl;
for(int d=0; d<rows; d++){
    for(int s=0; s<column; s++){
        cout<<M[d][s]<<" ";}
    cout<<endl;}}
```

```
enter the number of rows
2
enter the number of column
2
enter the elemnt of first matrix
1
2
3
4
enter the elemtn of second matrix
1
2
3
4
multiplication of matrix
7 17
32 54

Process returned 0 (0x0)   execution time : 7.660 s
```

Functions

Write function in C++ that will calculate table of a number in C++. Number must be passed

from calling function as an argument to function parameters.

```
#include<iostream>
using namespace std;
void table_fun(int t){
for(int i=1; i<11; i++){
     cout<<t<<" * "<<i<<" : "<<t*i<<endl;
}


}
int main(){
int table;
cout<<"Enter a number here"<<endl;cin>>table;
table_fun(table);

}
```

```
Enter a number here
5
5 * 1 : 5
5 * 2 : 10
5 * 3 : 15
5 * 4 : 20
5 * 5 : 25
5 * 6 : 30
5 * 7 : 35
5 * 8 : 40
5 * 9 : 45
5 * 10 : 50
```

Write function in C++ that will find factorial of a number. Number must be passed from calling function as an argument to function parameters.

```cpp
#include<iostream>
using namespace std;
void factorial(int a){
int fact=1;
while(a>=1){
    fact=fact*a;
    a--;
}
cout<<"Factorial = "<<fact<<endl;
}
int main(){
    int d;
    cout<<"Enter a number here"<<endl;
    cin>>d;
    factorial(d);
}
```

```
"E:\second semester\oop lab\assigme
Enter a number here
5
Factorial = 120
```

Update your calculator using functions (Calculator you implemented in do while loop section

question no. 05. Create separate functions for addition, subtraction, division, multiplication and

remainder operations).

```cpp
#include<iostream>
using namespace std;
int result,user;
void addition(int number1,int number2){
    result=number1+number2;
    cout<<result;}
void subtraction(int number1,int number2){
    result=number1-number2;
    cout<<result;}
void multiplication(int number1,int number2){
    result=number1*number2;
    cout<<result;}
void division(int number1,int number2){
    result=number1/number2;
    cout<<result;}
void remainder(int number1,int number2){
    result=number1%number2;
    cout<<result;}

int main(){
    int number1,number2;

    do{
    cout<<"Enter a number here"<<endl;
    cin>>number1>>number2;
    string op;
    cout<<"Enter a operator here"<<endl;cin>>op;
        if(op=="+"){
            addition(number1,number2);
        }else if(op=="-"){
            subtraction(number1,number2);
        }else if(op=="*"){
            multiplication(number1,number2);


        }else if(op=="/"){
        division(number1,number2);
        }else if(op=="%"){
            remainder(number1,number2);
        }

        cout<<"Do you want to again execute the loop '0'for no and '1' for yes";cin>>user;
        if(user==1){continue;}
        else if(user==0) {break;}
    }while(true);
}
```

```
Enter a number here
5
6
Enter a operator here
+
11
Do you want to again execute the loop '0'for no and '1' for yes1
Enter a number here
3
5
Enter a operator here
-
-2
Do you want to again execute the loop '0'for no and '1' for yes0

Process returned 0 (0x0)   execution time : 17.337 s
```

Pointers

Write a program to input data into an array (Take value from user at runtime for

inserting into array using loop) and find out the maximum value and minimum value from array

through pointer?

```cpp
#include <iostream>
using namespace std;
int main(){
int *MAX,*MIN;
int loop=0;


cout<<"how many time you want to iterate this loop :"<<endl;
cin>>loop;
int p[loop]; //array declaration
cout<<"enter value here";
for(int i=0; i<loop; i++){          //to get whole array from user
    cin>>p[i];}
for(int i=0;i <loop; i++){          //check max and min value
MAX=&p[0];
MIN=&p[0];
if (MAX < &p[i])
            MAX = &p[i];
        else if (MIN > &p[i])
            MIN = &p[i];
}
cout << "Largest element: "<< *MAX<<endl;       //pointer to  use get value instead of binary code
cout << "Smallest element: "<<*MIN;
return 0;
}
```

```
how many time you want to iterate this loop :
5
enter value here1
2
3
4
5
Largest element: 5
Smallest element: 1
Process returned 0 (0x0)   execution time : 34.304 s
Press any key to continue.
```

Write a program to convert Fahrenheit to Celsius degrees by passing pointers as

arguments to the function?

```cpp
#include<iostream>
using namespace std;
float *p;
float celcuis;
void convert(float *p){          //taking pointer argument as float
    celcuis=(*p -32)*5/9;        //*P to use location value not binary location
    cout<<celcuis;


}
int main(){
    float fahrenhite;
    cout<<"enter a fahrenheit tempratuer"<<endl;
    cin>>fahrenhite;                  //input farahehite
    p=&fahrenhite;
    convert(p);

}
```

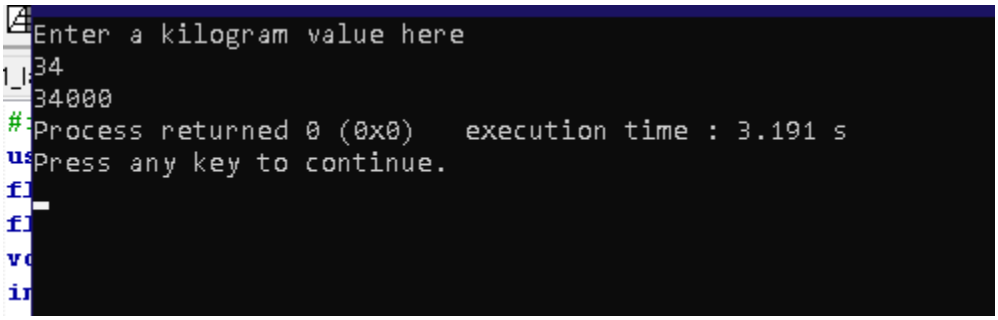
```
enter a fahrenheit tempratuer
56
13.3333
Process returned 0 (0x0)   execution time : 4.537 s
Press any key to continue.
```

convert kilogram into grams by passing pointers as arguments to the

function?

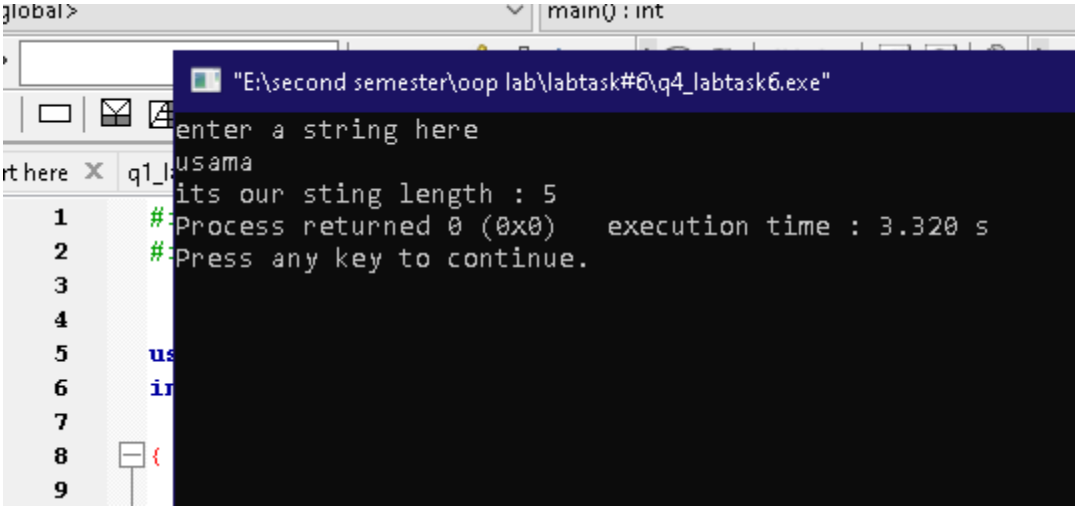
q1_labtask6.cpp | q2_labtask6.cpp | q3_labtask6.cpp

```cpp
#include<iostream>
using namespace std;
float *p;
float kilogram,gram;
void convert(float *);
int main(){
cout<<"Enter a kilogram value here"<<endl;
cin>>kilogram;
p=&kilogram;          //asign location to p
convert(p);           //caling function
}
void convert(float *p){
gram=(kilogram)*1000;        //here kilogram is not binary location in
                             //function caling we use *p to gave it orignal value
cout<<gram;

}
```



Write a program to find out the length of string by using pointers?

```cpp
#include<iostream>
#include<string>


using namespace std;
int main()

{



    char a[100];            //just declare the character string
    int count=0;
    cout<<"enter a string here"<<endl;
    cin>>a;                  //taken input
    char *p=a;
    for(char *i=p;  *i; i++){         //loop
        count++;
    }
    cout<<"its our sting length"<<count;


}
```



Write a program to copy one string to another string by using pointers?

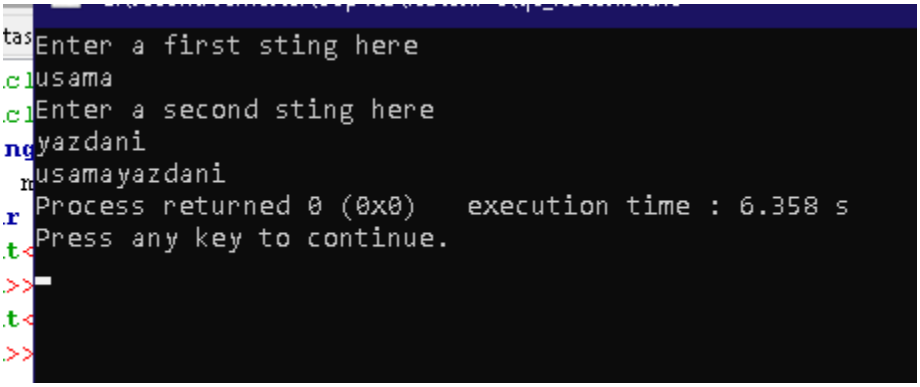
```cpp
#include<iostream>
using namespace std;
int main(){
    char str1[100];
    char str2[100];
    cout<<"Enter a string one here :"<<endl;
    cin>>str1;
    char *p=str1;



    for(int i=0;  str1[i]!='\0'; i++){        //loop
        str2[i]=p[i];

    }
    cout<<"here is our first string :"<<str1<<endl;
    cout<<"here is our  string after assign string one value : "<<str2<<endl;
```

```
Enter a string one here :
usama
here is our first string :usama
here is our  string after assign string one value : usama

Process returned 0 (0x0)   execution time : 3.933 s
Press any key to continue.
```

No.6: Write a program to combine two strings by using pointers?

q1_labtaskb.cpp | q2_labtaskb.cpp | q3_labtaskb.cpp | q4_labtaskb.cpp | q5_labtaskb.c | q5_labtaskb.cpp | "q6_lab"

```cpp
#include<iostream>
#include<string>
using namespace std;
int main(){
char str1[100],str2[100];
cout<<"Enter a first sting here"<<endl;
cin>>str1;
cout<<"Enter a second sting here"<<endl;
cin>>str2;
char *p=str1;
char *d=str2;


    while(*(++p)); //here loop will execute '\0' and read the data and
    while(*(p++) = *(d++)); //assign string 2 to string 1
    cout<<str1;
}
```



Structures

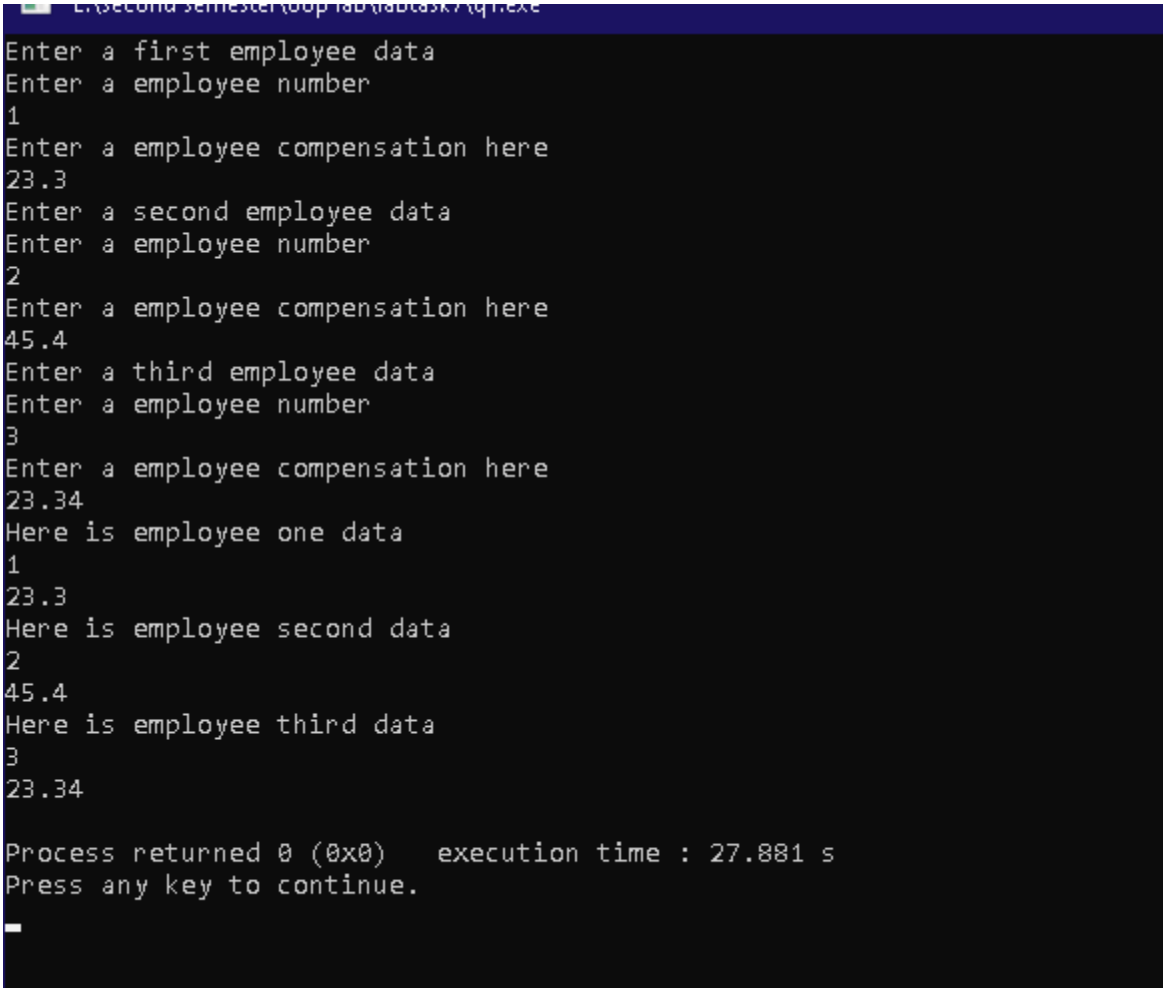
Create a structure called employee that contains two members: an employee number

(type int) and the employee's compensation (in dollars; type float). Ask the user to fill in

this data for three employees, store it in three variables of type struct employee, and then

display the information for each

```cpp
#include<iostream>
using namespace std;
struct employee{
int number;
float compensation;};
employee employee1,employee2,employee3;
void display(){
cout<<"Here is employee one data"<<endl;
cout<<employee1.number<<endl;
cout<<employee1.compensation<<endl;
cout<<"Here is employee second data"<<endl;
cout<<employee2.number<<endl;
cout<<employee2.compensation<<endl;
cout<<"Here is employee third data"<<endl;
cout<<employee3.number<<endl;
cout<<employee3.compensation<<endl;}
int main(){
cout<<"Enter a first employee data"<<endl;
cout<<"Enter a employee number"<<endl;
cin>>employee1.number;
cout<<"Enter a employee compensation here"<<endl;
cin>>employee1.compensation;
cout<<"Enter a second employee data"<<endl;
cout<<"Enter a employee number"<<endl;
cin>>employee2.number;
cout<<"Enter a employee compensation here"<<endl;
cin>>employee2.compensation;
cout<<"Enter a third employee data"<<endl;
cout<<"Enter a employee number"<<endl;
cin>>employee3.number;
cout<<"Enter a employee compensation here"<<endl;
cin>>employee3.compensation;
display();
}
```



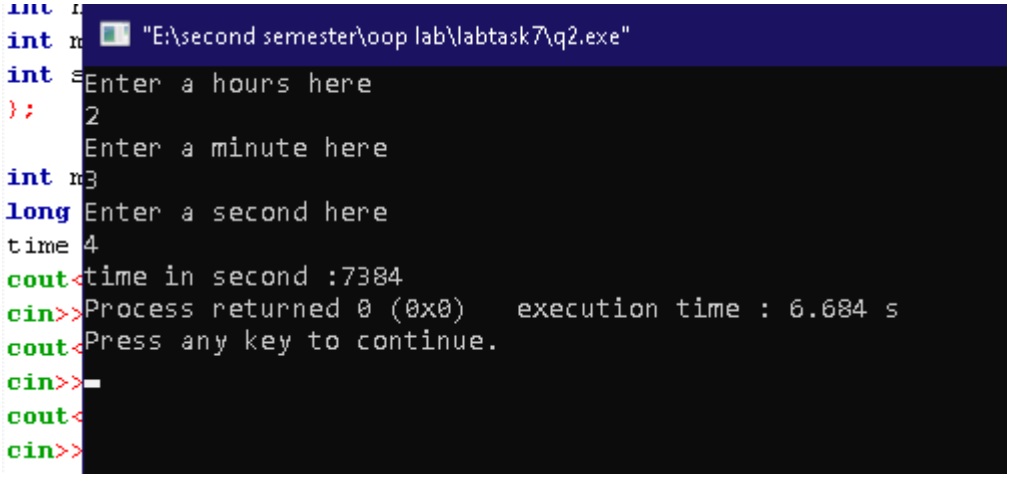
Create a structure called time. Its three members, all type int, should be called hours,

minutes, and seconds. Write a program that prompts the user to enter a time value in

hours, minutes, and seconds. The program should then store the time in a variable of type

struct time, and finally print out the total number

```cpp
#include<iostream>
using namespace std;
struct time{
int hours;
int minute;
int second;
};

int main(){
long time_in_second;
time t;
cout<<"Enter a hours here "<<endl;
cin>>t.hours;
cout<<"Enter a minute here "<<endl;
cin>>t.minute;
cout<<"Enter a second here "<<endl;
cin>>t.second;

time_in_second=(t.hours*3600)+(t.minute*60)+(t.second);
cout<<"time in second :"<<time_in_second;

}
```



Use the time structure from above question and write a program that obtains two time

values from the user, stores them in struct time variables, converts each one to seconds

(type int), adds these quantities, converts the result back to hours-minutes- seconds,

stores the result in a time structure, and finally displays the result in 12:59:59 format

```cpp
using namespace std;
struct time{
int hours;
int minute;
int second;
};
int main(){
long timemin,timehours,timesec,timemin2,timhours2,timesec2,for_hours,for_min,for_sec;
int hours,minute,second;
time t1,t2;
cout<<"Enter a hours here "<<endl;
cin>>t1.hours;
cout<<"Enter a minute here "<<endl;
cin>>t1.minute;
cout<<"Enter a second here "<<endl;
cin>>t1.second;
cout<<"Enter a 2nd time hours here "<<endl;
cin>>t2.hours;
cout<<"Enter a 2nd time minute here "<<endl;
cin>>t2.minute;
cout<<"Enter a 2nd time second here "<<endl;
cin>>t2.second;
timehours=(t1.hours*3600);
timemin=(t1.minute*60);
timesec=(t1.second);
timhours2=(t2.hours*3600);
timemin2=(t2.minute*60);
timesec2=(t2.second);
for_hours=timehours+timhours2;
for_min=timemin2+timemin;
for_sec=timesec2+timesec;
for_hours=for_hours/3600;
for_min=for_min/60;
cout<<for_hours<<":"<<for_min<<":"<<for_sec;
}
```

```
Enter a hours here
1
Enter a minute here
2
Enter a second here
3
Enter a 2nd time hours here
1
Enter a 2nd time minute here
2
Enter a 2nd time second here
3
2:4:6
Process returned 0 (0x0)   execution time : 5.035 s
Press any key to continue.
```

A phone number, such as (212) 767-8900, can be thought of as having three parts: the

area code (212), the exchange (767), and the number (8900). Write a program that uses

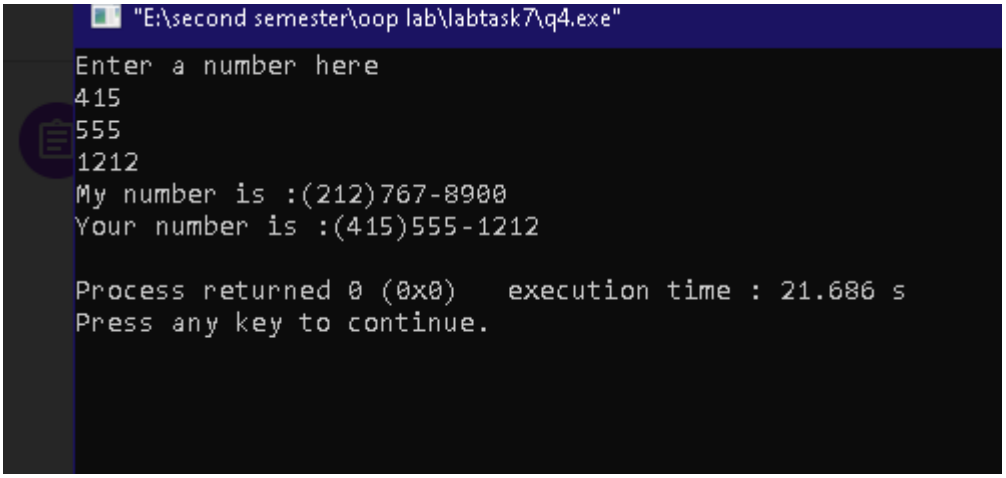
a structure to store these three parts of a phone number separately. Call the structure

phone. Create two structure variables of type phone. Initialize one, and have the user

input a number for the other one. Then display both numbers. The interchange might

look like this:

```
#include<iostream>
using namespace std;
struct phone{
int area=212;
int exchange=767;
int number=8900;

};
struct phone2{

int area;
int exchange;
int number;


};
int main(){
phone p1;
phone2 p2;
cout<<"Enter a number here"<<endl;
cin>>p2.area>>p2.exchange>>p2.number;
cout<<"My number is :("<<p1.area<<")"<<p1.exchange<<"-"<<p1.number<<endl;
cout<<"Your number is :("<<p2.area<<")"<<p2.exchange<<"-"<<p2.number<<endl;


}
```



Implement the given nested structure in the following figures. Note: Only write the definitions of structs nothing else. It is not a complete program.

```
struct date_of_birth{

int day;
int month;
int year;

};
struct employee{
string name;
int id;
string gender;
int age;
struct date_of_birth  birth;
};
//second nested struct
struct vegetable{
string food1;
string food2;};
struct fruit{
string food3;
string food4;};
struct food{
    struct vegetable v;
    struct fruit f;

};
```