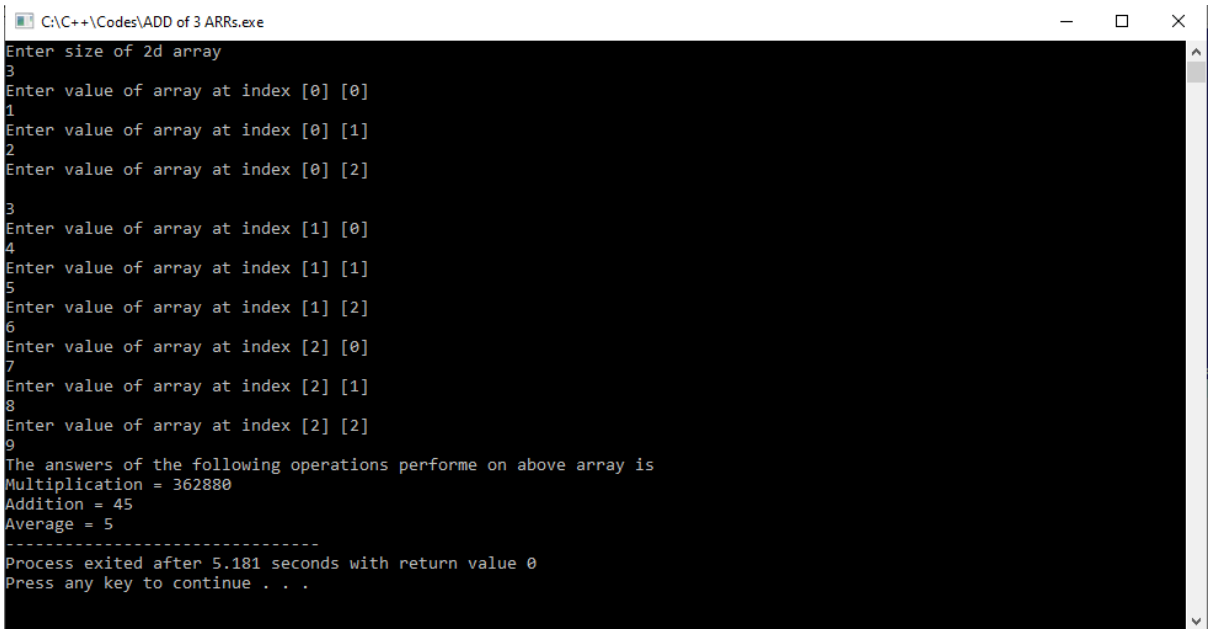
1.Write a program in C++ that take integer type 2D array from user, calculate sum multiplication and average of all numbers.

```
#include<iostream>
using namespace std;
int main(){
	int size,mult=1,sum=0,avg;
	cout<<"Enter size of 2d array\n";
	cin>>size;



	int arr[size][size];
	for(int i=0;i<size;i++){
		for(int j=0;j<size;j++){
			cout<<"Enter value of array at index ["<<i<<"] ["<<j<<"]\n";
			cin>>arr[i][j];
			mult=mult*arr[i][j];
			sum=sum+arr[i][j];
			avg=sum/(size*size);
		}
	}
cout<<"The answers of the following operations performe on above array is "<<endl<<"Multiplication = "<<mult<<"\nAddition = "<<sum<<"\nAverage = "<<avg;
```

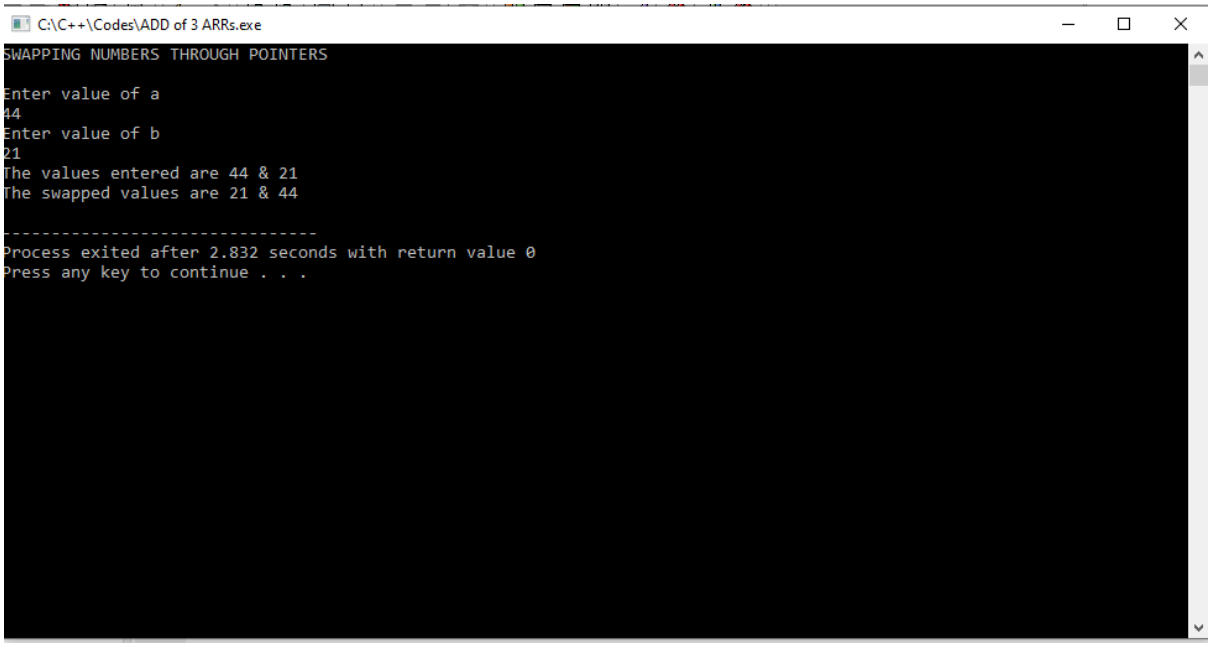
}



2.Write a program in C++ to swap values of two variables using pointers.

```
#include <iostream>
#include <conio.h>
using namespace std;
int main() {
cout << "SWAPPING NUMBERS THROUGH POINTERS\n" << endl;
int a, b;
cout << "Enter value of a" << endl;
cin >> a;
cout << "Enter value of b" << endl;
cin >> b;
cout << "The values entered are " << a <<" & " << b << endl;
int* ptra = &a;
int* ptrb = &b;
int temp = *ptra;
```

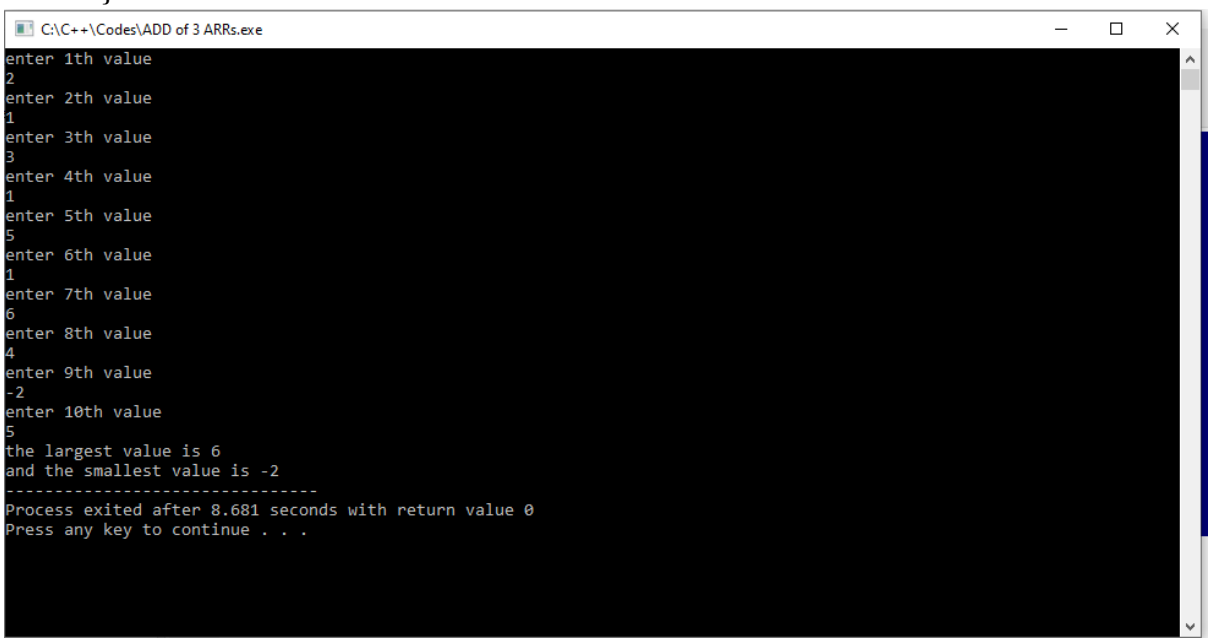
```
*ptra = *ptrb;

*ptrb = temp;

cout << "The swapped values are " << a <<" & " << b << endl;

}
```



3. Write a program that lets the user to enter the 10 values into the array. The program should then display the largest and the smallest values stored in the array.

```
#include <iostream>

using namespace std;

int main(){

        int lar,small;


        int arr[10];

        for(int i=0;i<10;i++){

                cout<<"enter "<<i+1<<"th value"<<endl;

                cin>>arr[i];

                if(i==0){

                lar=arr[i];

                small=arr[i];
```

```
        }

    if(lar<arr[i]){
    lar=arr[i];


    }
    if(small>arr[i]){
    small=arr[i];
    }}
    cout<<"the largest value is "<<lar<<"\nand the smallest value is "<<small;
    }
```



4. Write a program that lets the user to enter the total rainfall for each of 12 months into an array of doubles. The program should calculate and display the total rainfall for the year, the average monthly rainfall and the month with the highest and lowest rainfall.

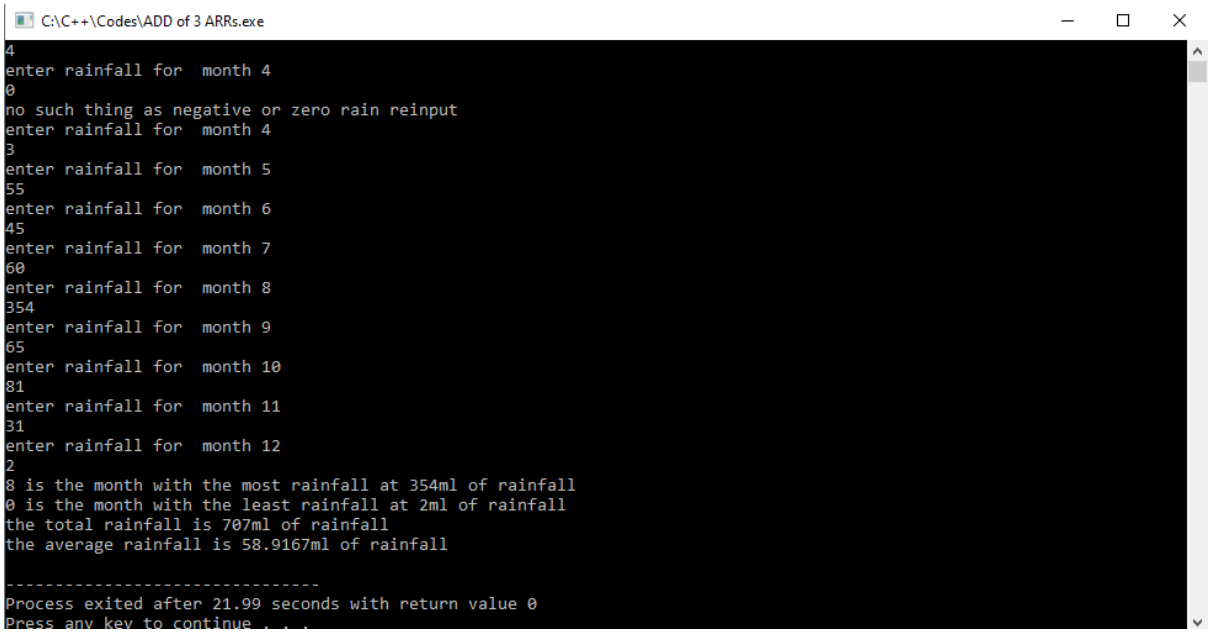
```
#include <iostream>

using namespace std;

int main(){

    double lar,small,total=0,avg=0;

    int smallind,larind;
```

```
double arr[12];
for(int i=0;i<12;i++){
        label:
        cout<<"enter rainfall for  month "<<i+1<<endl;
        cin>>arr[i];
        if (arr[i]<1){
        cout<<"no such thing as negative or zero rain reinput"<<endl;
        goto label;
        }

        total=total+arr[i];
        avg=total/12;
        if(i==0){
        lar=arr[i];
        small=arr[i];
        }

if(lar<arr[i]){
lar=arr[i];
larind=i+1;



}
if(small>arr[i]){
small=arr[i];
smallind=i+1;
}}
```

cout<<larind<<" is the month with the most rainfall at "<<lar<<"ml of rainfall"<<endl<<smallind<<" is the month with the least rainfall at "<<small<<"ml of rainfall"<<endl;

cout<<"the total rainfall is "<<total<<"ml of rainfall"<<endl<<"the average rainfall is "<<avg<<"ml of rainfall"<<endl;

}



QNO 5: Write a program that creates a two dimensional array initialized with test data. Perform the following operations on the array data.

Get total: get total of all the elements in the array.....

```
#include <iostream>
#include <conio.h>
using namespace std;
int main() {
int array[3][3] = { {1,2,3},{4,5,6},{7,8,9} };
int total = 0;
double average = 0;
int totalnum = 3 * 3;
int columnNo = 1;
```

```
int rowNo=0;
int rowsum1 = 0;
int rowsum2 = 0;
int rowsum3 = 0;
int colsum1 = 0;
int colsum2 = 0;
int colsum3 = 0;
cout << "THE ARRAY ELEMENTS\n" << endl;
for (int i = 0; i < 3; i++)
{
for (int j = 0; j < 3; j++)
{
cout << array[i][j] << " ";
total += array[i][j];
}
cout << endl;
}
average = static_cast<double>(total) / totalnum;
cout << "\nTHE TOTAL OF ARRAY IS: " << total <<
endl;
cout << "\nTHE AVERGAE OF ARRAY IS: " << average << endl;
for (int i = 0; i < 3; i++){

for (int j = 0; j < 3; j++)
{switch(i){

case 0:
```

```
rowsum1 += array[i][j];
break;
case 1:
rowsum2 += array[i][j];
break;
case 2:
rowsum3 += array[i][j];
break;
}}}
cout << "\nTHE ROW 1 SUM IS: " << rowsum1 << endl;
cout << "\nTHE ROW 2 SUM IS: " << rowsum2 << endl;
cout << "\nTHE ROW 3 SUM IS: " << rowsum3 << endl;

for (int i = 0; i < 3; i++){

for (int j = 0; j < 3; j++)
{switch(j){

case 0:
colsum1 += array[i][j];
break;
case 1:
colsum2 += array[i][j];
break;
case 2:
colsum3 += array[i][j];
break;
```

```
}}}

cout << "\nTHE COLUMN 1 SUM IS: " << colsum1 <<endl;
cout << "\nTHE COLUMN 2 SUM IS: " << colsum2 <<endl;
cout << "\nTHE COLUMN 3 SUM IS: " << colsum3 <<endl;
rowNo = 0;

int hhighestrow = array[rowNo][0];

for (int j = 0; j < 3; j++)

{
if (array[rowNo][j] > hhighestrow)

{
hhighestrow = array[rowNo][j];
}
}
cout << "\nTHE HIGHEST IN ROW NO 1 IS: " <<hhighestrow << endl;
columnNo = 1;
int hhighestcol = array[0][columnNo];
for (int i = 0; i < 3; i++)
{
if (array[i][columnNo] > hhighestcol)
{
hhighestcol = array[i][columnNo];
}
```

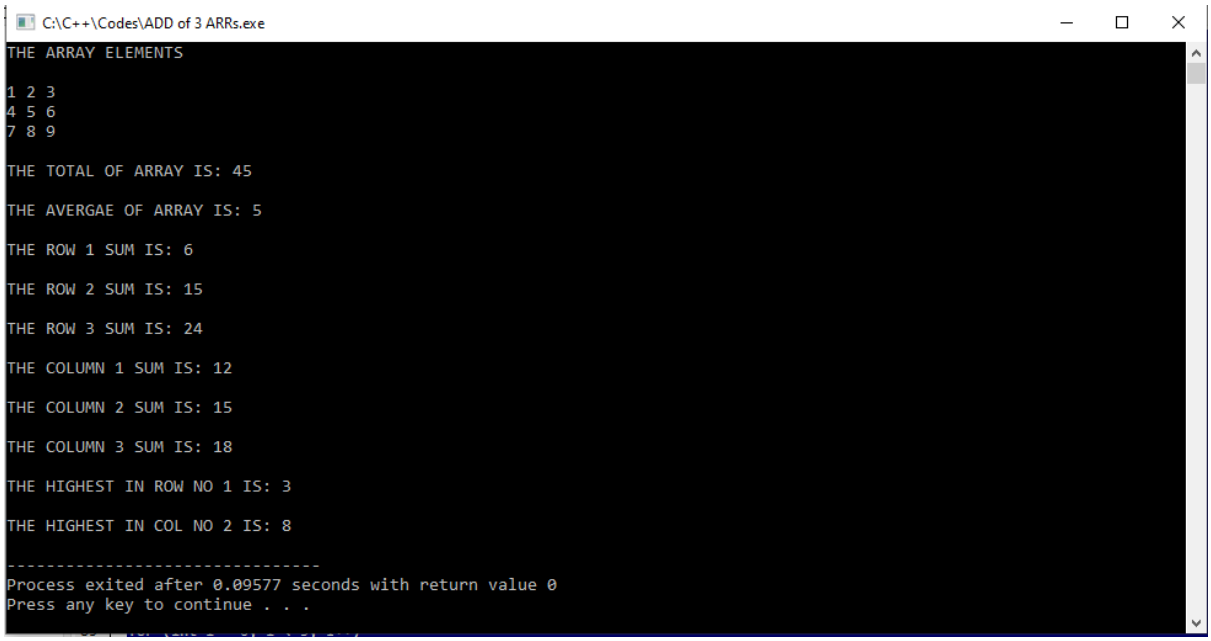
}

cout << "\nTHE HIGHEST IN COL NO 2 IS: " <<

hhighestcol << endl;

}

OUTPUT:

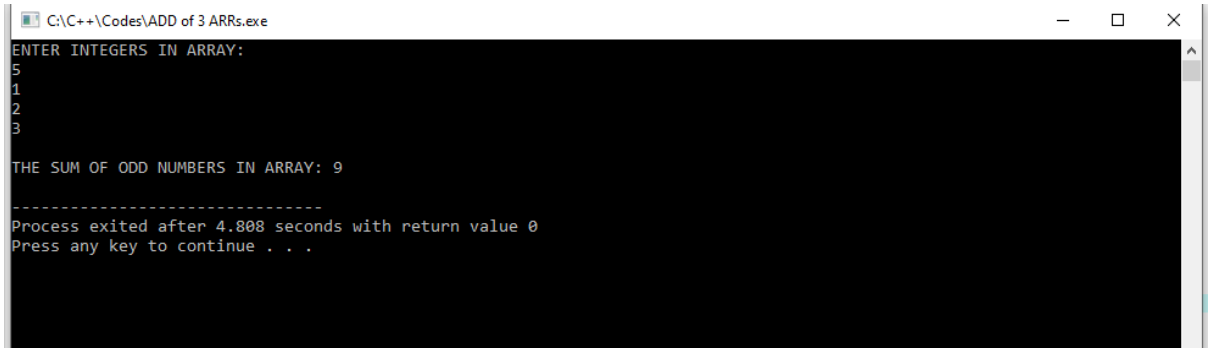


QNO 6: Write a program that dynamically allocates an array of integers. Read the values from user and calculate the sum of odd integers.

```
#include <iostream>
#include <conio.h>
using namespace std;
int main() {
	int size = 4;
	int sumodd = 0;
	int* array = new int[size];
	cout << "ENTER INTEGERS IN ARRAY: " << endl;
	for (int i = 0; i < size; i++)
	{
		cin >> array[i];
		if (array[i] % 2 != 0)
	{
		sumodd += array[i];
	}
	}
```

```
        cout << "\nTHE SUM OF ODD NUMBERS IN ARRAY: " <<
        sumodd << endl;
}
```

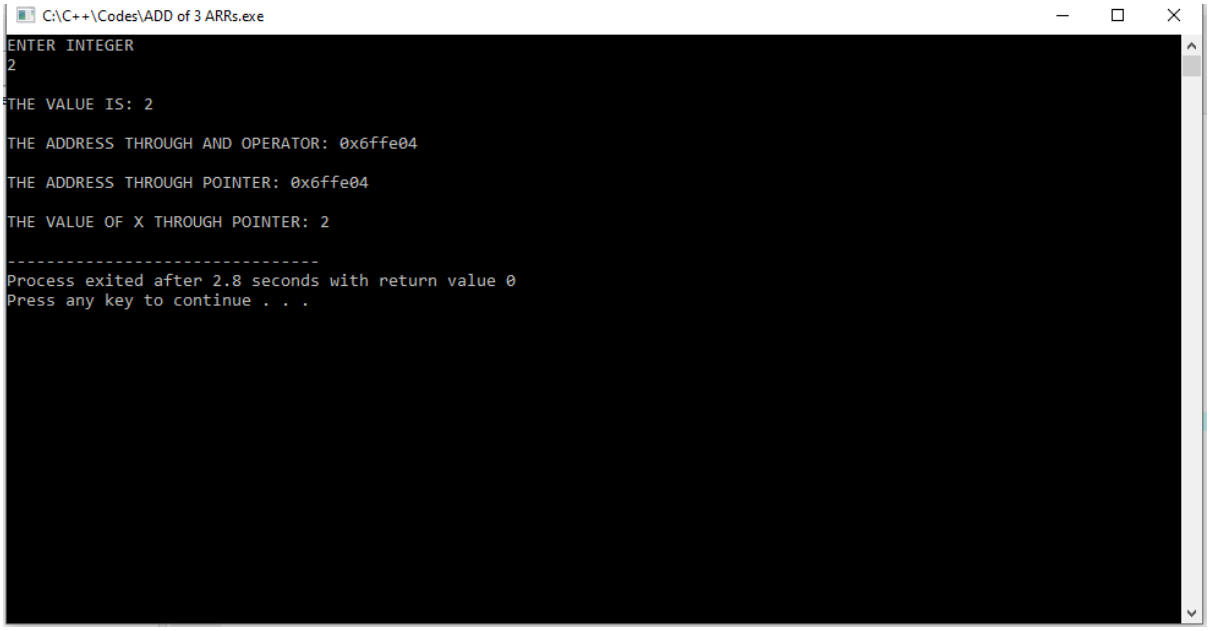
OUTPUT:



QNO 7: Define a pointer variable. Assign the address of variable to a pointer variable and access the value of address variable in the pointer variable.

```
#include <iostream>
#include <conio.h>
using namespace std;
int main() {
        int x;
        int* ptrx = &x;
        cout << "ENTER INTEGER" << endl;
        cin >> x;
        cout << "\nTHE VALUE IS: " << x << endl;
        cout << "\nTHE ADDRESS THROUGH AND OPERATOR: " <<
        &x << endl;
        cout << "\nTHE ADDRESS THROUGH POINTER: " << ptrx
        << endl;
        cout << "\nTHE VALUE OF X THROUGH POINTER: " <<
        *ptrx << endl;
```

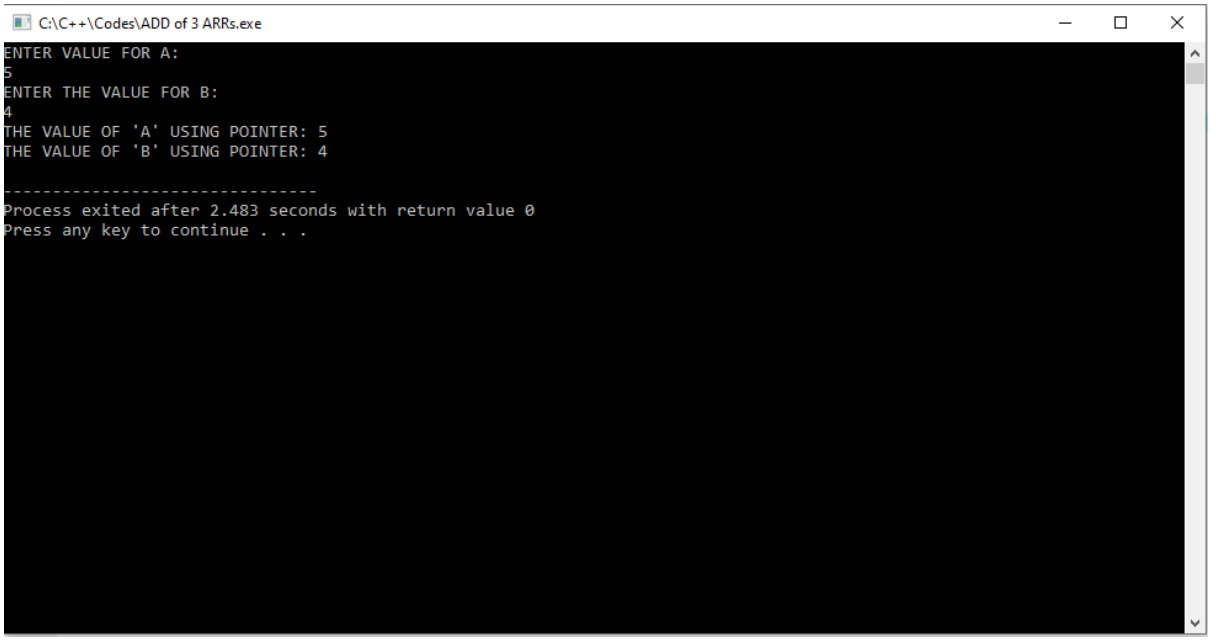
}
OUTPUT:



QNO 8: Write a program that asks the user to enter integers as inputs to be stored in the variables 'a' and 'b' respectively. There are also two integer pointers named ptrA and ptrB. Assign the values of 'a' and 'b' to ptrA and ptrB respectively, and display them.

```
#include <iostream>
#include <conio.h>
using namespace std;
int main() {
	int a, b;
	cout << "ENTER VALUE FOR A: " << endl;
	cin >> a;
	cout << "ENTER THE VALUE FOR B: " << endl;
	cin >> b;
	int* ptrA = &a;
	int* ptrB = &b;
	cout << "THE VALUE OF 'A' USING POINTER: " << *ptrA
	<< endl;
	cout << "THE VALUE OF 'B' USING POINTER: " << *ptrB
	<< endl;
}
```

OUTPUT:



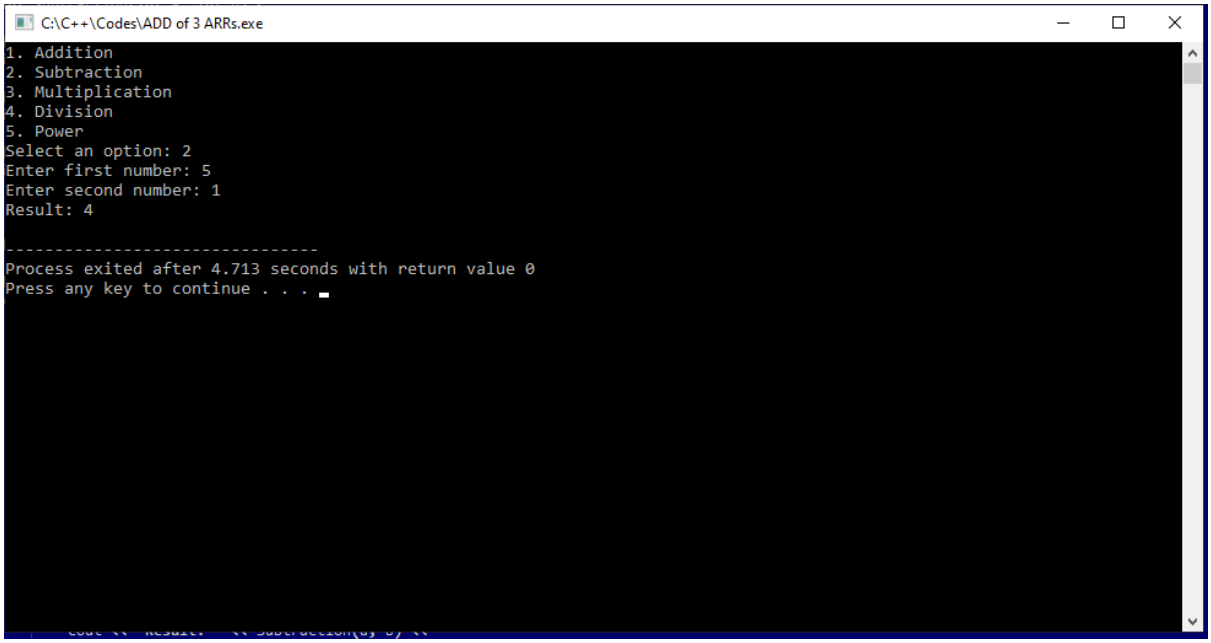
QNO 9: Write a program for a calculator using functions. Your program must have the following functions: a. Menu () telling the user to select from the options

b. Addition (int a, int b) adding two numbers....

```
#include <iostream>
using namespace std;
int Addition(int a, int b) {
	return a + b;
}
int Subtraction(int a, int b) {
	return a - b;
}
int Multiplication(int a, int b) {
		return a * b;
}
int Division(int a, int b) {
	return a / b;
}
int Pow(int number, int power) {
	int result = 1;
	for (int i = 0; i < power; i++) {
		result *= number;
}
	return result;
}
void Menu() {
```

```
	int choice, a, b;
	cout << "1. Addition\n";
	cout << "2. Subtraction\n";
	cout << "3. Multiplication\n";
	cout << "4. Division\n";
	cout << "5. Power\n";
	cout << "Select an option: ";
	cin >> choice;
	cout << "Enter first number: ";
	cin >> a;
	cout << "Enter second number: ";
	cin >> b;
	switch (choice) {
		case 1:
		cout << "Result: " << Addition(a, b) << endl;
		break;
		case 2:
		cout << "Result: " << Subtraction(a, b) <<
		endl;
		break;
		case 3:
		cout << "Result: " << Multiplication(a, b) <<
		endl;
		break;
		case 4:
		if (b != 0) {
		cout << "Result: " << Division(a, b) <<
		endl;
		}
		else {
		cout << "Error: Division by zero!" << endl;
		}
		break;
		case 5:
		cout << "Result: " << Pow(a, b) << endl;
		break;
		default:
		cout << "Invalid choice!" << endl;
}
}
int main() {
Menu();
return 0;
```

}
OUTPUT:


C:\C++\Codes\ADD of 3 ARRs.exe
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Power
Select an option: 2
Enter first number: 5
Enter second number: 1
Result: 4
Process exited after 4.713 seconds with return value 0
Press any key to continue . . .