ASSIGNMENT-1

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Question 1-

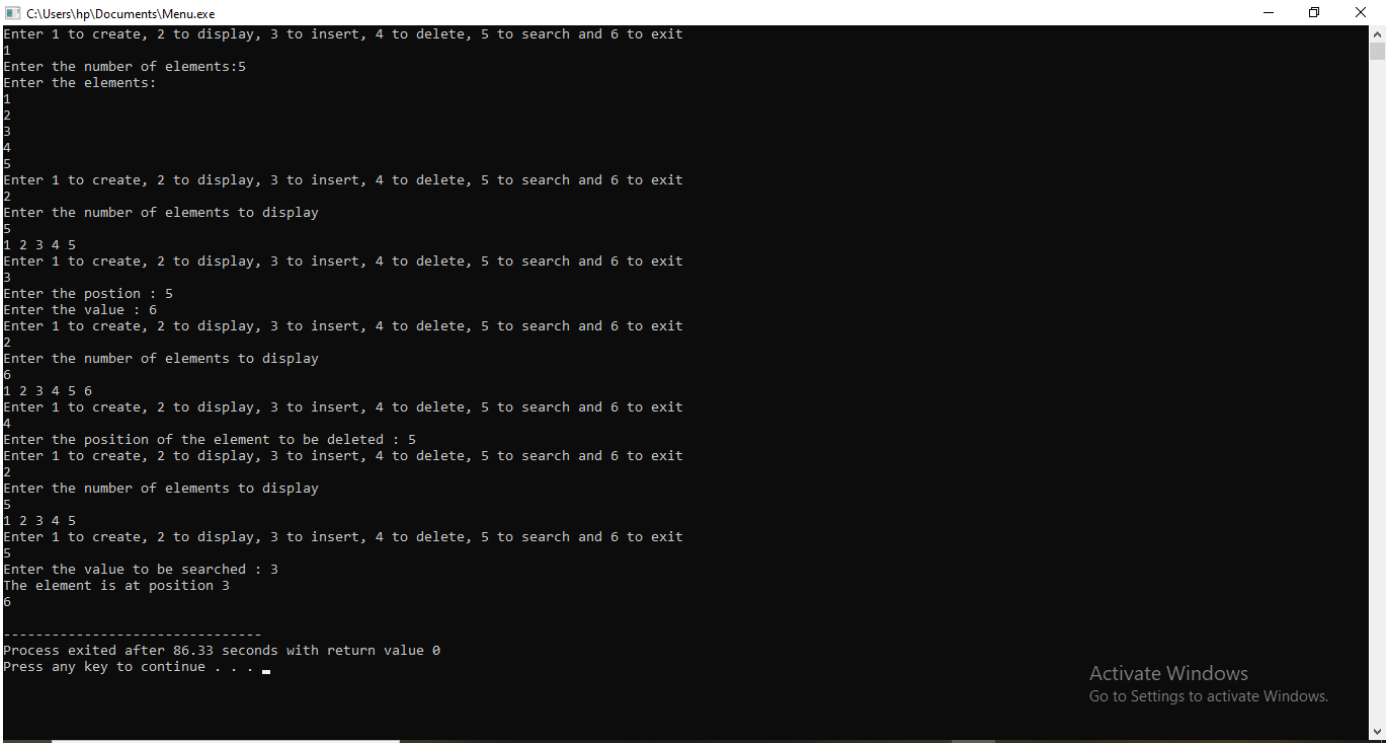
```
#include<iostream>

#define max 100

using namespace std;


int n=0, arr[max];


void create()

{


        cout<<"Enter the number of elements:";

        cin>>n;

        cout<<"Enter the elements:\n";

        for(int i=0; i<n; i++)

        {

                cin>>arr[i];

        }

        cout<<"Enter 1 to create, 2 to display, 3 to insert, 4 to delete, 5 to search and 6 to
exit\n";

}


void display()

{

   int num;

        cout<<"Enter the number of elements to display\n";

        cin>>num;

        if(num==0)
```

```
	{
		cout<<"Nothing to display";
	}
	for(int i=0; i<num; i++)
	{
		cout<<arr[i]<<" ";
	}
	cout<<"\nEnter 1 to create, 2 to display, 3 to insert, 4 to delete, 5 to search and 6 to exit\n";
}

void insert()
{
	int pos, value;
	do
	{
		cout<<"Enter the postion : ";
		cin>>pos;
	}while(pos>n);
	cout<<"Enter the value : ";
	cin>>value;
	for(int i=n-1; i>=pos; i--)
	{
		arr[i+1]=arr[i];
	}
	arr[pos]=value;
	n=n+1;
```

```
	cout<<"Enter 1 to create, 2 to display, 3 to insert, 4 to delete, 5 to search and 6 to exit\n";
}

void del()
{
	int pos;
	do
	{
		cout<<"Enter the position of the element to be deleted : ";
		cin>>pos;
	}while (pos>=n);
	for(int i=pos; i<n-1; i++)
	{
		arr[i]=arr[i+1];
	}
	n=n-1;
	cout<<"Enter 1 to create, 2 to display, 3 to insert, 4 to delete, 5 to search and 6 to exit\n";
}

void search()
{
	int target;
	cout<<"Enter the value to be searched : ";
	cin>>target;
	for(int i=0; i<n; i++)
```

```
	{
		if(arr[i]==target)
		{
			cout<<"The element is at position "<<i+1;
			return;
		}
	}
	return;
	cout<<"Enter 1 to create, 2 to display, 3 to insert, 4 to delete, 5 to search and 6 to exit\n";
}



int main()
{
	int x;
	cout<<"Enter 1 to create, 2 to display, 3 to insert, 4 to delete, 5 to search and 6 to exit\n";
	cin>>x;
	while(x!=6){


	switch(x)
	{
		case 1 : create();
				break;
		case 2 : display();
				break;
```

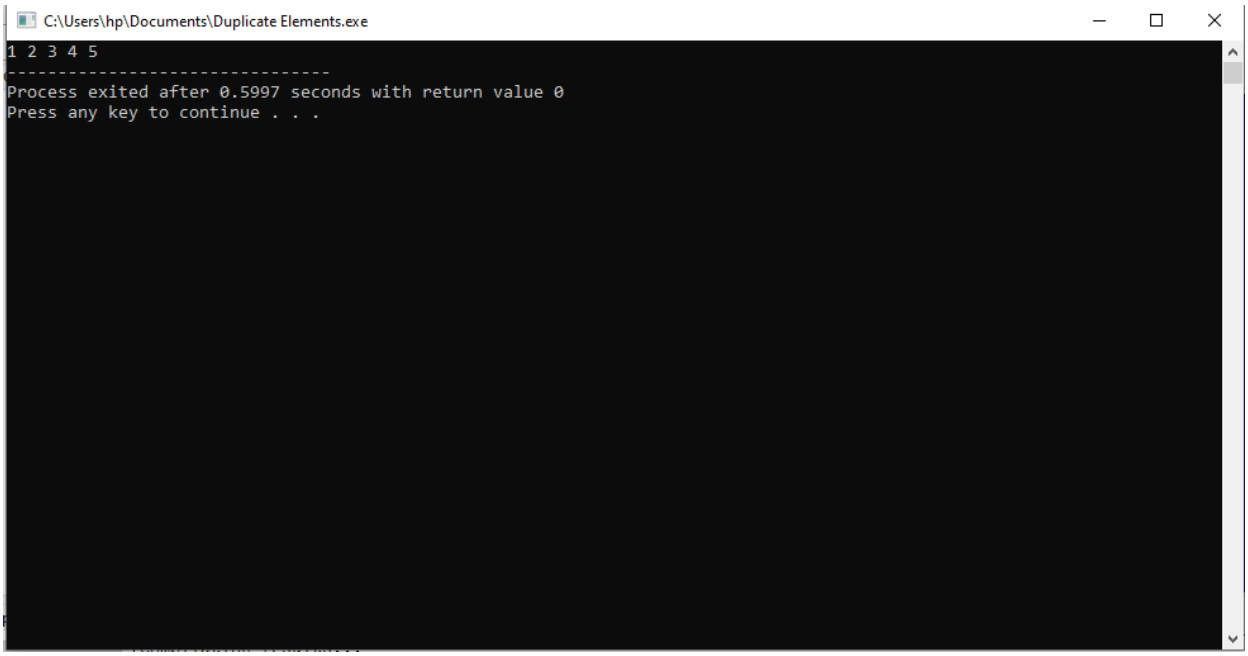
```
            case 3 : insert();
                        break;
            case 4 : del();
                        break;
            case 5 : search();
                        break;
            case 6 : return 0;
        }
        cin>>x;
}
}
```



Question 2-

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

int removeDuplicates(int arr[], int n)
{
   if (n==0 || n==1)
      return n;
   int temp[n];
   int j = 0;
   for (int i=0; i<n-1; i++)
      if (arr[i] != arr[i+1])
         temp[j++] = arr[i];
          temp[j++] = arr[n-1];
   for (int i=0; i<j; i++)
      arr[i] = temp[i];
   return j;
}

int main()
{
   int arr[] = {1, 2, 2, 3, 4, 4, 4, 5, 5};
   int n = sizeof(arr) / sizeof(arr[0]);
   n = removeDuplicates(arr, n);
   for (int i=0; i<n; i++)
     cout << arr[i] << " ";
```

```
    return 0;
}
```



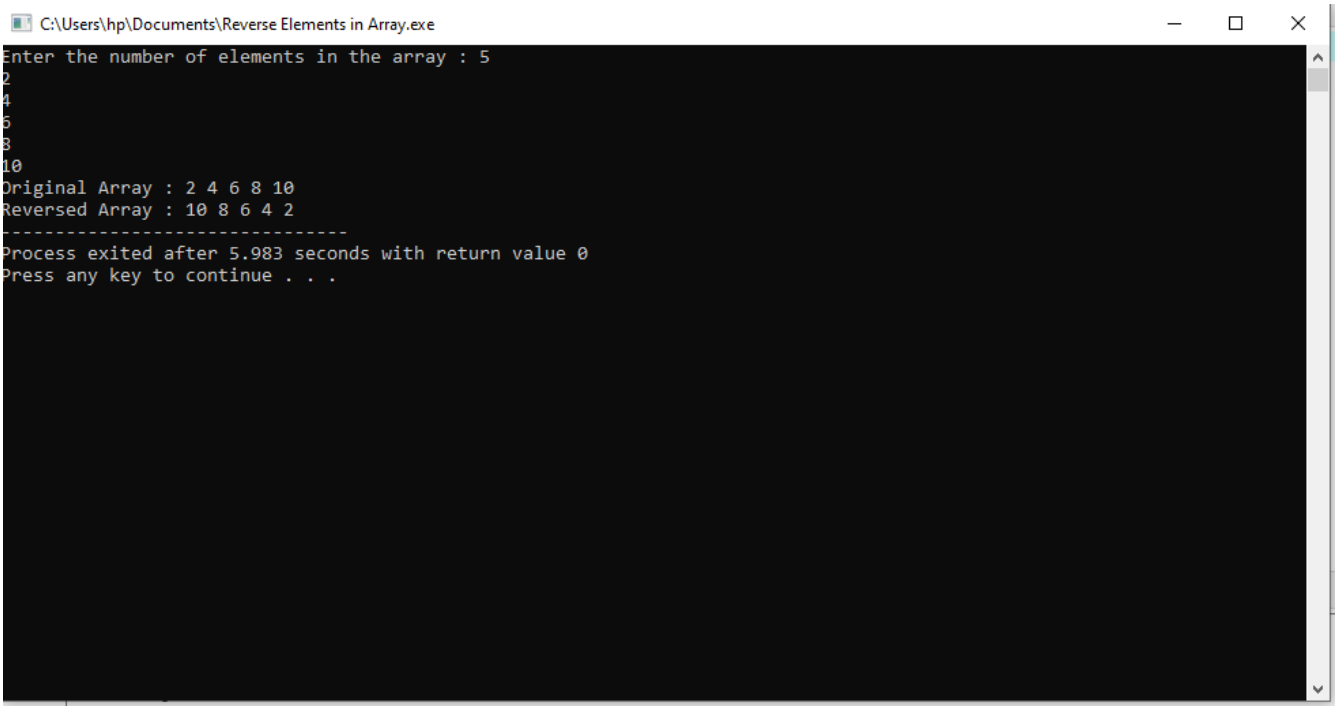
Question 3-

{1, 0, 0, 0, 0}

Question 4-

(i)

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


    int main(){
            int n, arr[n];
            cout<<"Enter the number of elements in the array : ";
            cin>>n;
            for(int i=0; i<n; i++){
                    cin>>arr[i];
            }
            cout<<"Original Array : ";
            for(int i=0; i<n; i++){
                    cout<<arr[i]<<" ";
            }
            cout<<"\nReversed Array : ";
            for(int i=n-1; i>=0; i--){
                    cout<<arr[i]<<" ";
            }
            return 0;
    }
```


C:\Users\hp\Documents\Reverse Elements in Array.exe
Enter the number of elements in the array : 5
2
4
6
8
10
Original Array : 2 4 6 8 10
Reversed Array : 10 8 6 4 2

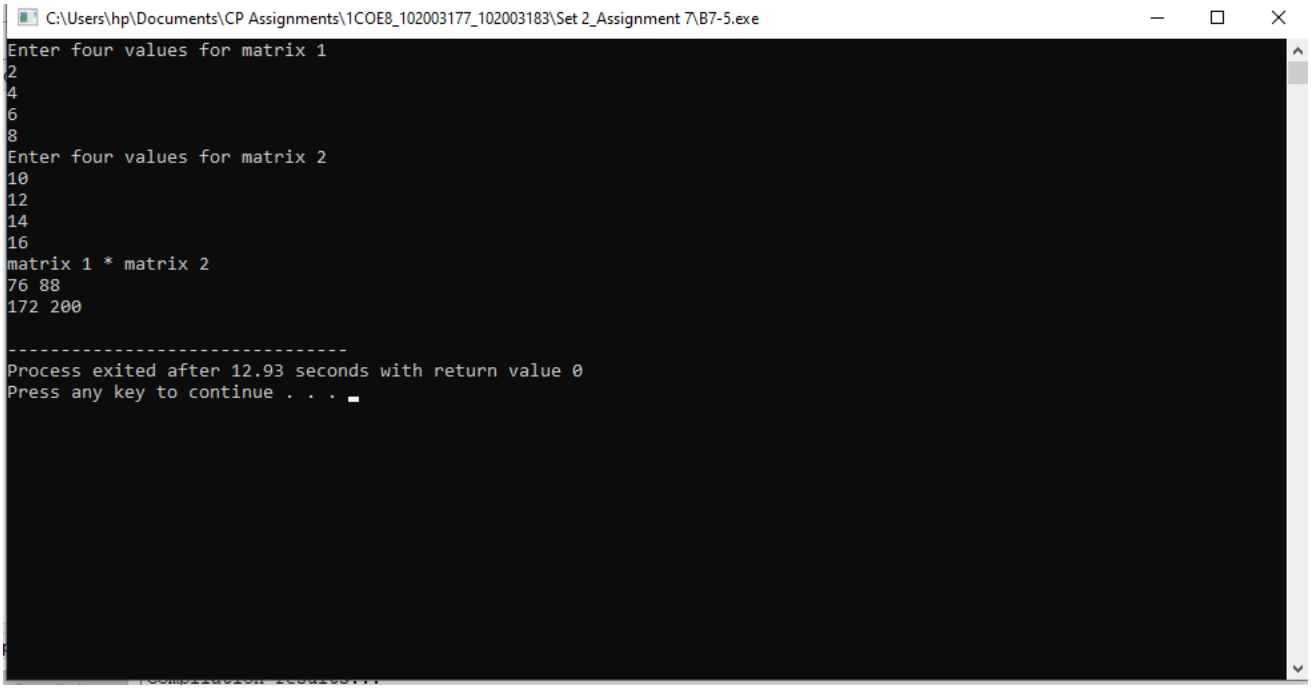
Process exited after 5.983 seconds with return value 0
Press any key to continue . . .

(ii)

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

class matrix
{
        public:
         int arr[2][2];
         matrix operator*(matrix &m)
        {
                 matrix y;
                 for (int i = 0; i < 2; i++)
                {
                        for (int j = 0; j < 2; j++)
                        {
                                y.arr[i][j] = 0;
                                for (int k = 0; k < 2; k++) {
                                        y.arr[i][j] += this->arr[i][k] * m.arr[k][j];
                                }
                          }
                }
                return y;
        }
};

 int main()
{
```

```
matrix m1, m2, m3;
cout<<"Enter four values for matrix 1"<<endl;
for(int i=0; i<2; i++)
{
		for(int j=0; j<2; j++)
		{
			cin>>m1.arr[i][j];
		}
 }
cout<<"Enter four values for matrix 2"<<endl;
for(int i=0; i<2; i++)
 {
		for(int j=0; j<2; j++)
		{
			cin>>m2.arr[i][j];
		}
  }

  cout<<"matrix 1 * matrix 2"<<endl;
  m3=m1*m2;
  for(int i=0; i<2; i++)
  {
		for(int j=0; j<2; j++)
		{
			cout<<m3.arr[i][j]<<" ";
		}
```

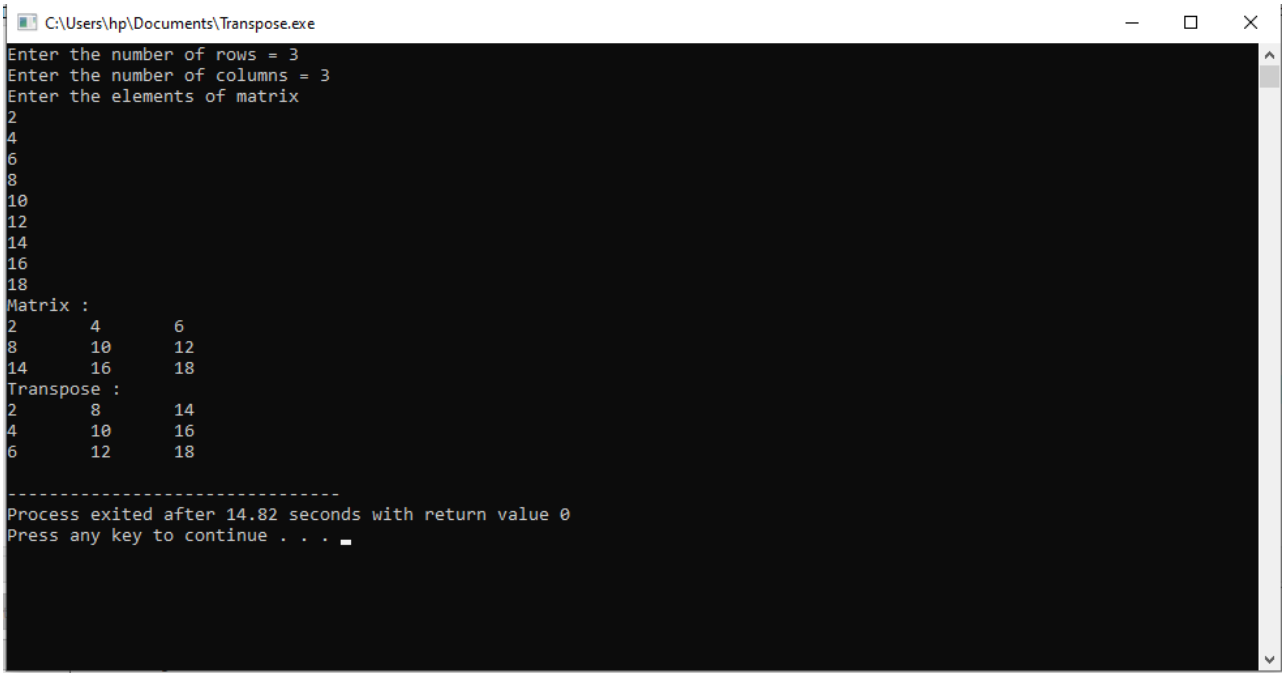
```
                cout<<endl;
            }
            return 0;
    }
```



(iii)

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

int main()
{
    int r, c;
    cout<<"Enter the number of rows = ";
    cin>>r;
    cout<<"Enter the number of columns = ";
    cin>>c;
    int a[r][c];
    cout<<"Enter the elements of matrix"<<endl;
    for(int i=0; i<r; i++)
    {
        for(int j=0; j<c; j++)
        {
            cin>>a[i][j];
        }
    }
    cout<<"Matrix : "<<endl;
    for(int i=0; i<r; i++)
    {
        for(int j=0; j<c; j++)
        {
            cout<<a[i][j]<<"\t";
        }
```

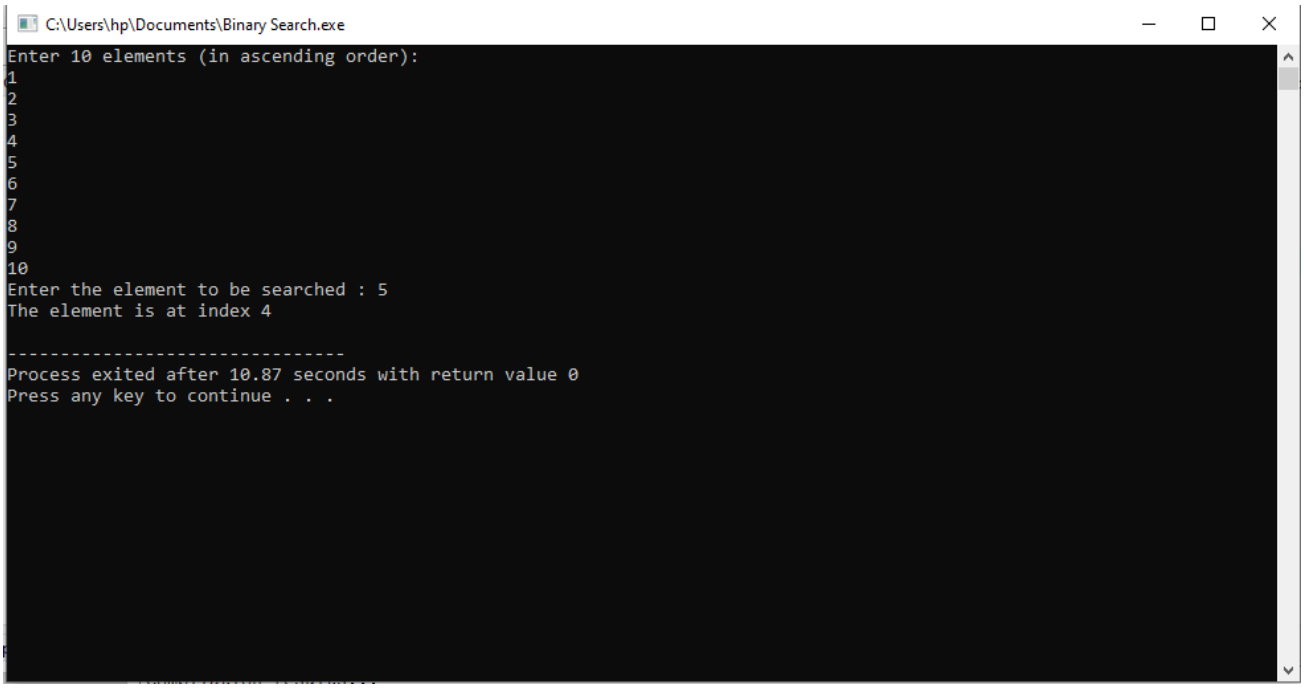
```
            cout<<endl;
        }
        cout<<"Transpose : "<<endl;
        for(int i=0; i<c; i++)
        {
            for(int j=0; j<r; j++)
            {
                cout<<a[j][i]<<"\t";
            }
            cout<<endl;
        }
    }
```



Question 5-

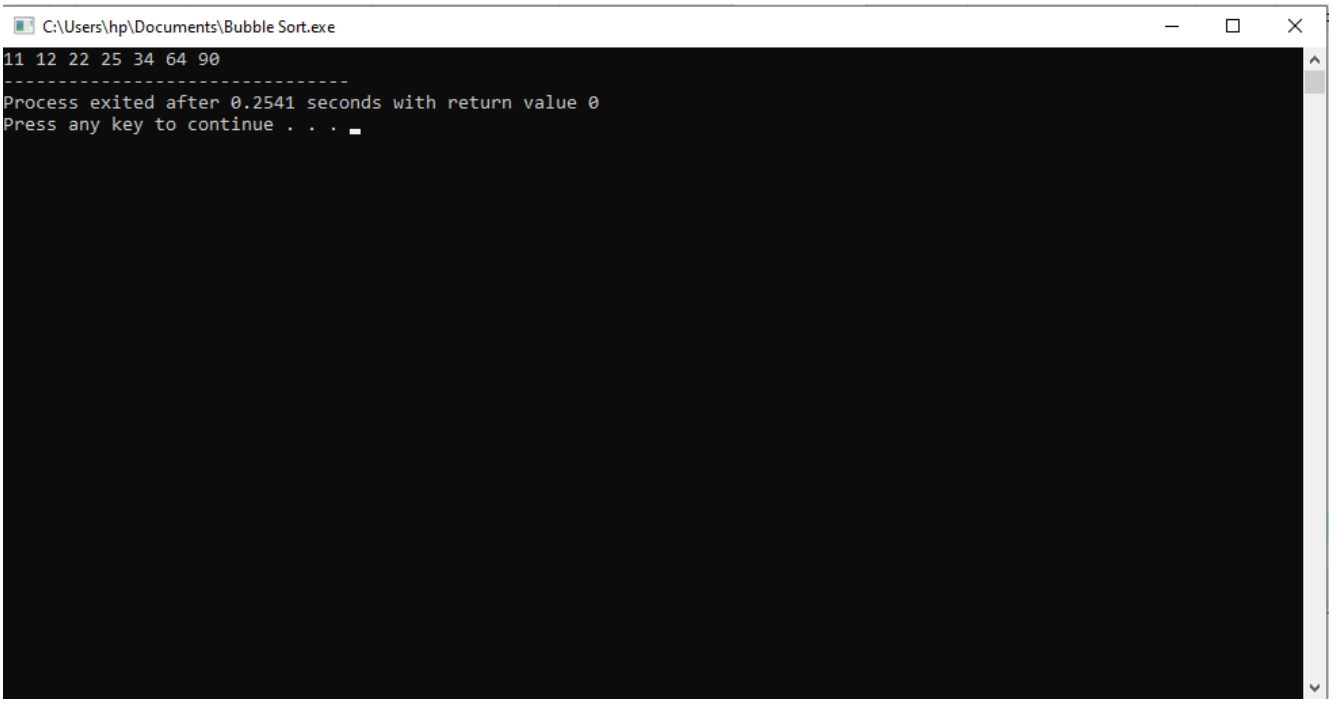
```
#include<iostream>
using namespace std;
int main()
{
   int i, arr[10], target;
   cout<<"Enter 10 elements (in ascending order):\n";
   for(i=0; i<10; i++)
   {
      cin>>arr[i];
   }
   cout<<"Enter the element to be searched : ";
   cin>>target;
   int start = 0;
   int end = 9;
   while(start<=end){
         int mid=start+(end-start)/2;
         if(arr[mid]==target){
                  cout<<"The element is at index "<<mid;
                  break;
                  }
                  else if(arr[mid]>target){
                           end=mid-1;
                  }
                  else{
                           start=mid+1;
```

```
            }
        }
    if(start>end)
       cout<<"The element is not found in the given array";
    cout<<endl;
    return 0;
}
```



Question 6-

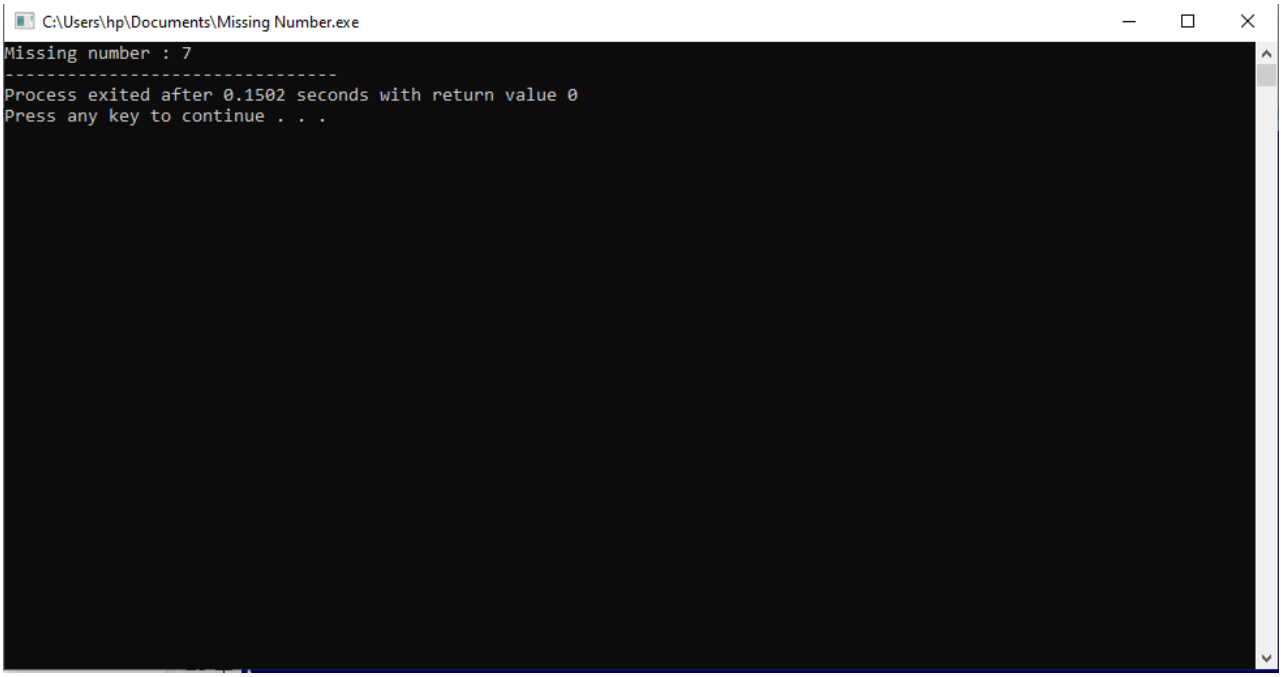
```
#include<iostream>
using namespace std;
int main()
{
   int arr[7]={64, 34, 25, 12, 22, 11, 90};
   int n=7;
   for(int i=0; i<n; i++)
   {
      for(int j=1; j<n-i; j++)
      {
         if(arr[j-1]>arr[j])
         {
            int temp = arr[j];
            arr[j] = arr[j-1];
            arr[j-1] = temp;
         }
      }
   }

   for(int i=0; i<n; i++){
          cout<<arr[i]<<" ";
          }
   return 0;
}
```


C:\Users\hp\Documents\Bubble Sort.exe
11 12 22 25 34 64 90

Process exited after 0.2541 seconds with return value 0
Press any key to continue . . .

Question 7-

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

int search(int arr[], int size)
{
   int a = 0, b = size - 1;
   int mid;
   while ((b - a) > 1) {
      mid = (a + b) / 2;
      if ((arr[a] - a) != (arr[mid] - mid))
         b = mid;
      else if ((arr[b] - b) != (arr[mid] - mid))
         a = mid;
   }
   return (arr[a] + 1);
}

int main()
{
   int arr[] = { 1, 2, 3, 4, 5, 6, 8 };
   int size = sizeof(arr) / sizeof(arr[0]);
   cout << "Missing number : " << search(arr, size);
}
```


C:\Users\hp\Documents\Missing Number.exe
Missing number : 7

Process exited after 0.1502 seconds with return value 0
Press any key to continue . . .