PF LAB WORK

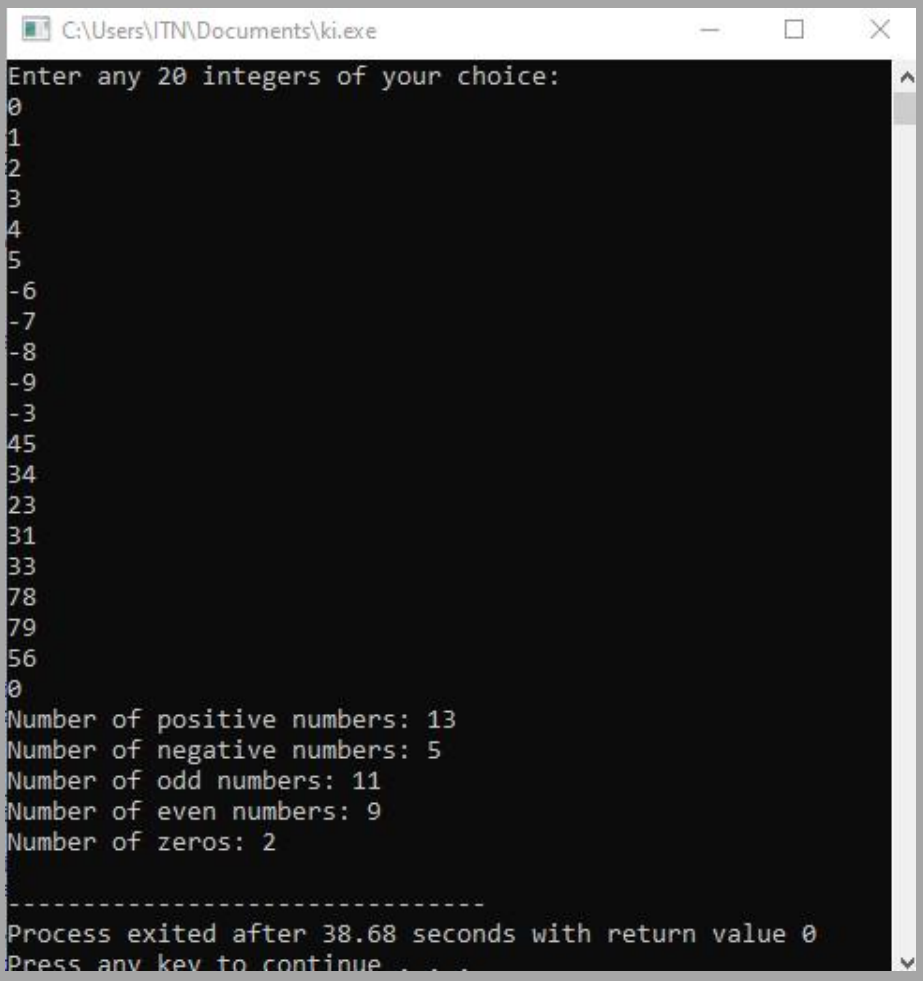
[ARRAYS]

[LINTA AFFAF]

TOPIC: ARRAYS

QUESTION NO 1

Take 20 integer inputs from user and print the following:
number of positive numbers
number of negative numbers
number of odd numbers
number of even numbers
number of 0.

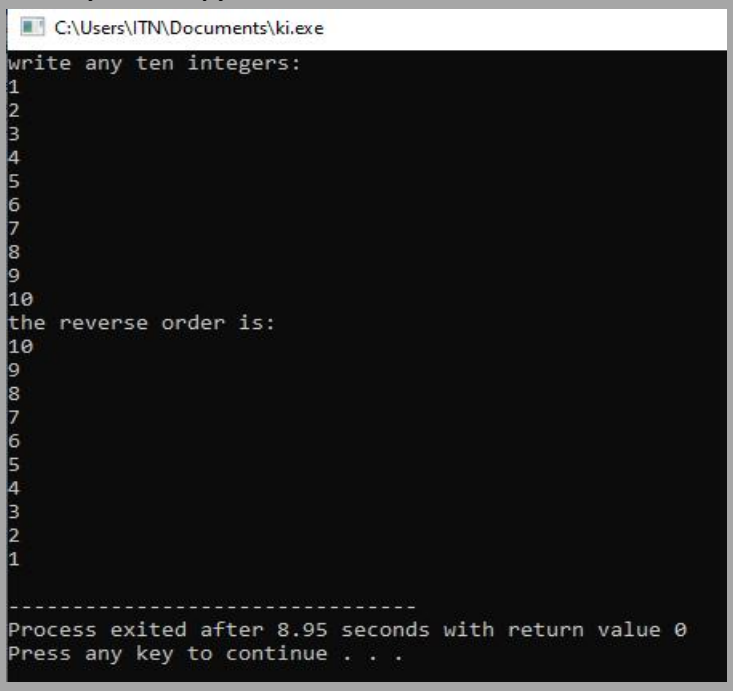



```
#include <iostream>
using namespace std;

void countNumbers(int arr[],
int size, int &posCount, int
&negCount, int &oddCount,
int &evenCount, int
&zeroCount) {
   for (int i = 0; i < size; ++i) {
      if (arr[i] > 0) {
         posCount++;
      } else if (arr[i] < 0) {
         negCount++;
      }

      if (arr[i] % 2 == 0) {
         evenCount++;
      } else {
         oddCount++;
      }

      if (arr[i] == 0) {
         zeroCount++;
      }
   }
}
int main() {
   const int size = 20;
   int numbers[size];
   cout << "Enter any 20 integers of your choice:" << endl;
   for (int i = 0; i < size; ++i) {
      cin >> numbers[i];
   }
  int posCount = 0, negCount = 0, oddCount = 0, evenCount = 0, zeroCount = 0;
  countNumbers(numbers, size, posCount, negCount, oddCount, evenCount, zeroCount);

   cout << "Number of positive numbers: " << posCount << endl;
   cout << "Number of negative numbers: " << negCount << endl;
   cout << "Number of odd numbers: " << oddCount << endl;
   cout << "Number of even numbers: " << evenCount << endl;
   cout << "Number of zeros: " << zeroCount << endl;

   return 0;
}
```

QUESTION NO 2

Take 10 integer inputs from user and store them in an array. Now, copy all the elements in another array but in reverse order

```
#include <iostream>
using namespace std;
main(){
            int arr[10];
            cout<<"write any ten integers: "<<endl;
            for(int i=0; i<=9;i++)
            cin>>arr[i];

   cout<<"the reverse order is: "<<endl;
            for(int i=9; i>=0;i--)
            cout<<arr[i]<<endl;



   return 0;
}
```

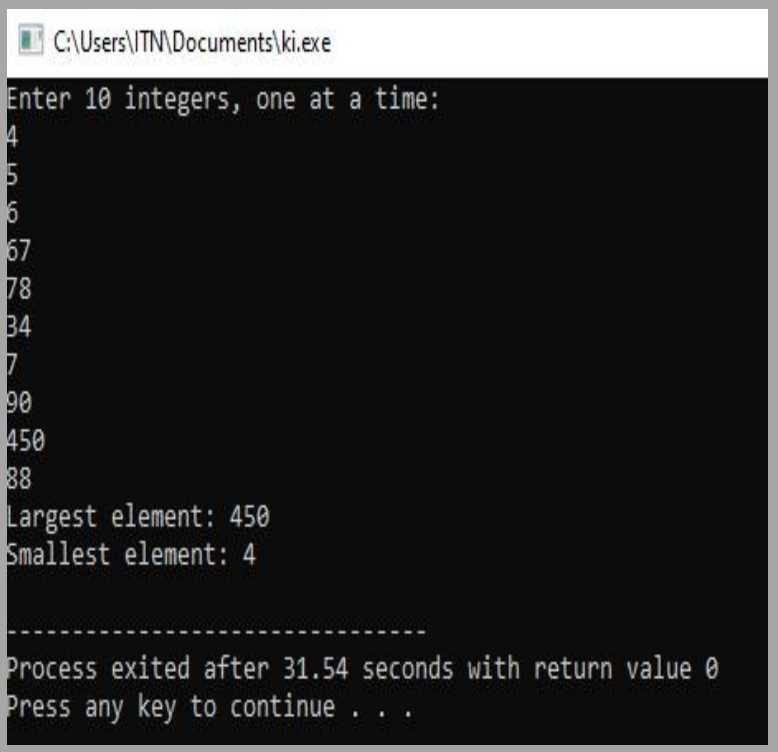


QUESTION NO 3.

Find the largest and smallest elements of an array.

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

void findLargestAndSmallest(int arr[], int size, int &largest, int &smallest) {
   if (size == 0) {
   largest = smallest = 0;
      return;
   }
   largest = smallest = arr[0];
   for (int i = 1; i < size; ++i) {
      if (arr[i] > largest) {
         largest = arr[i];
      } else if (arr[i] < smallest) {
         smallest = arr[i];
      }
   }
}

int main() {
   const int size = 10;
   int numbers[size];
   cout << "Enter " << size << " integers, one at a time:" << endl;

   for (int i = 0; i < size; ++i) {
```

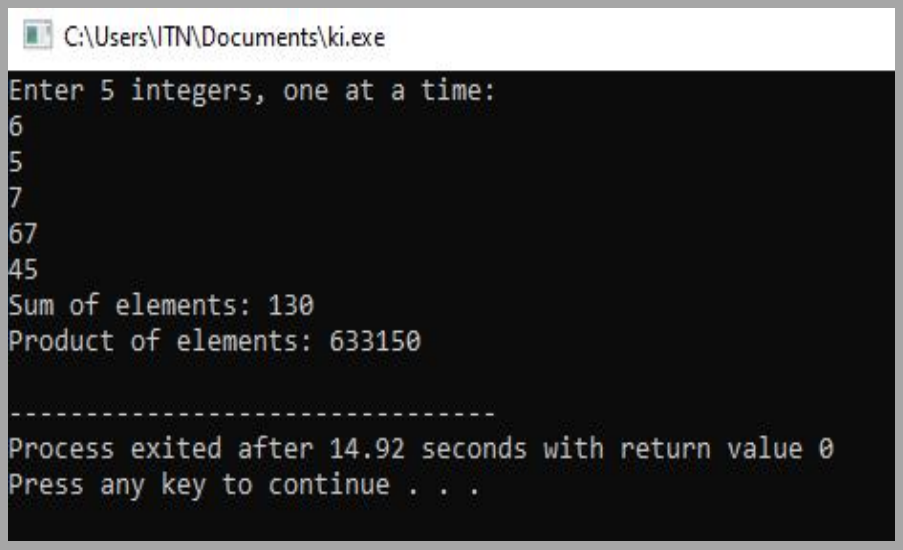
```
    cin >> numbers[i];
  }
   int largest, smallest;
  findLargestAndSmallest(numbers, size, largest
smallest);

  cout << "Largest element: " << largest << endl;
  cout << "Smallest element: " << smallest <<
endl;

  return 0;
}
```



QUESTION NO 4

Write a program to find the sum and product of all elements of an array.

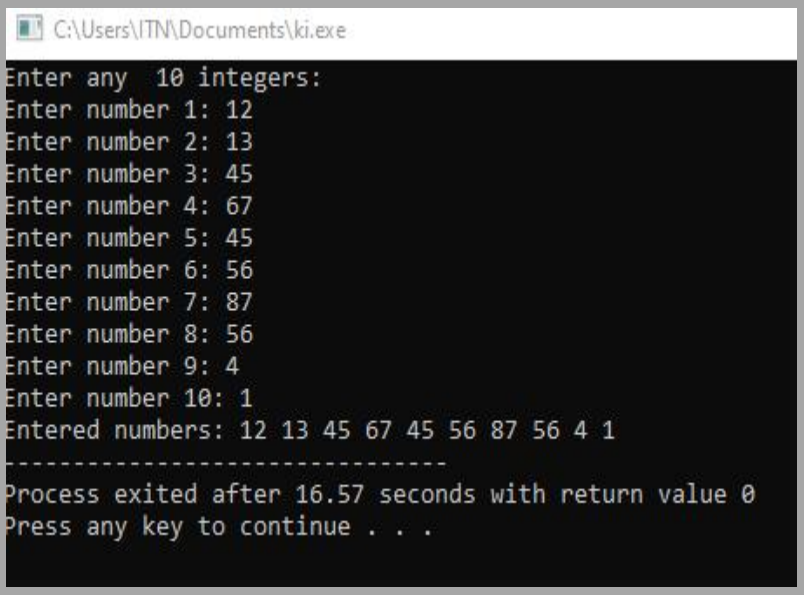
```
#include <iostream>
using namespace std;

void findSumAndProduct(int arr[], int size, int &sum,  int &product) {
  sum = 0;
  product = 1;
  for (int i = 0; i < size; ++i) {
    sum += arr[i];
    product *= arr[i];
  }
}
  int main() {
  const int size = 5;
  int numbers[size];
  cout << "Enter " << size << "
integers, one at a time:" << endl;

  for (int i = 0; i < size; ++i) {
    cin >> numbers[i];
  }
  int sum;
  int product;
  findSumAndProduct(numbers, size, sum, product);
  cout << "Sum of elements: " << sum << endl;
  cout << "Product of elements: " << product << endl;

  return 0;
}
```



QUESTION NO 5

Take 10 integer inputs from user and store them in an array and print them on screen.

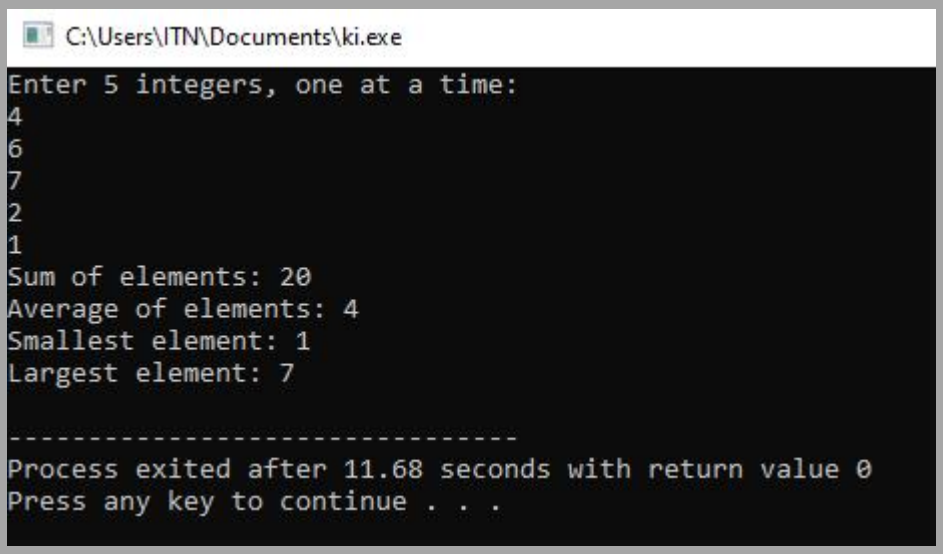
```
#include <iostream>
using namespace std;

int main() {
   int size = 10;
   int numbers[size];

   cout << "Enter any  10 integers: " << endl;


   for (int i = 0; i < size; ++i) {
      cout << "Enter number " << i + 1 << ": ";
      cin >> numbers[i];
   }
   cout << "Entered numbers: ";
   for (int i = 0; i < size; ++i) {
      cout << numbers[i] << " ";
   }

   return 0;
            }
```



QUESTION NO 6

Write a program to print sum, average of all numbers, smallest and largest element of an array.

```
#include <iostream>
using namespace std;
void calculateStats(int arr[], int size, int &sum, double &average, int &smallest, int &largest) {

   sum = 0;
   smallest = largest = arr[0];


   for (int i = 0; i < size; ++i) {
      sum += arr[i];

      if (arr[i] < smallest) {
         smallest = arr[i];
      }

      if (arr[i] > largest) {
         largest = arr[i];
      }
   }


   average = static_cast<double>(sum) / size;
}
int main() {
  const int size = 5;
   int numbers[size];
```



```
    cout << "Enter " << size << " integers, one at a time:" << endl;

    for (int i = 0; i < size; ++i) {
        cin >> numbers[i];
    }

    int sum, smallest, largest;
    double average;


    calculateStats(numbers, size, sum, average, smallest, largest);

    cout << "Sum of elements: " << sum << endl;
    cout << "Average of elements: " << average << endl;
    cout << "Smallest element: " << smallest << endl;
    cout << "Largest element: " << largest << endl;

    return 0;
}
```

QUESTION NO 7

Take 10 integer inputs from user and store them in an array. Again ask user to give a number. Now, tell user whether that number is present in array or not.

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

int main() {
    const int size = 10;
    int numbers[size];

    cout << "Enter 10 integers, one at a time:" << endl;
    for (int i = 0; i < size; ++i) {
        cout << "Enter number " << i + 1 << ": ";
        cin >> numbers[i];
    }

    int targetNumber;
    bool found = false;
    cout << "Enter a number to check if it is present in the array: ";
    cin >> targetNumber;

    for (int i = 0; i < size; ++i) {
        if (numbers[i] == targetNumber) {
            found = true;
            break;
        }
    }
    if (found) {
```

```
    cout << targetNumber << " is present in the array." << endl;
} else {
    cout << targetNumber << " is not present in the array." << endl;
}

return 0;}
```