

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;
```

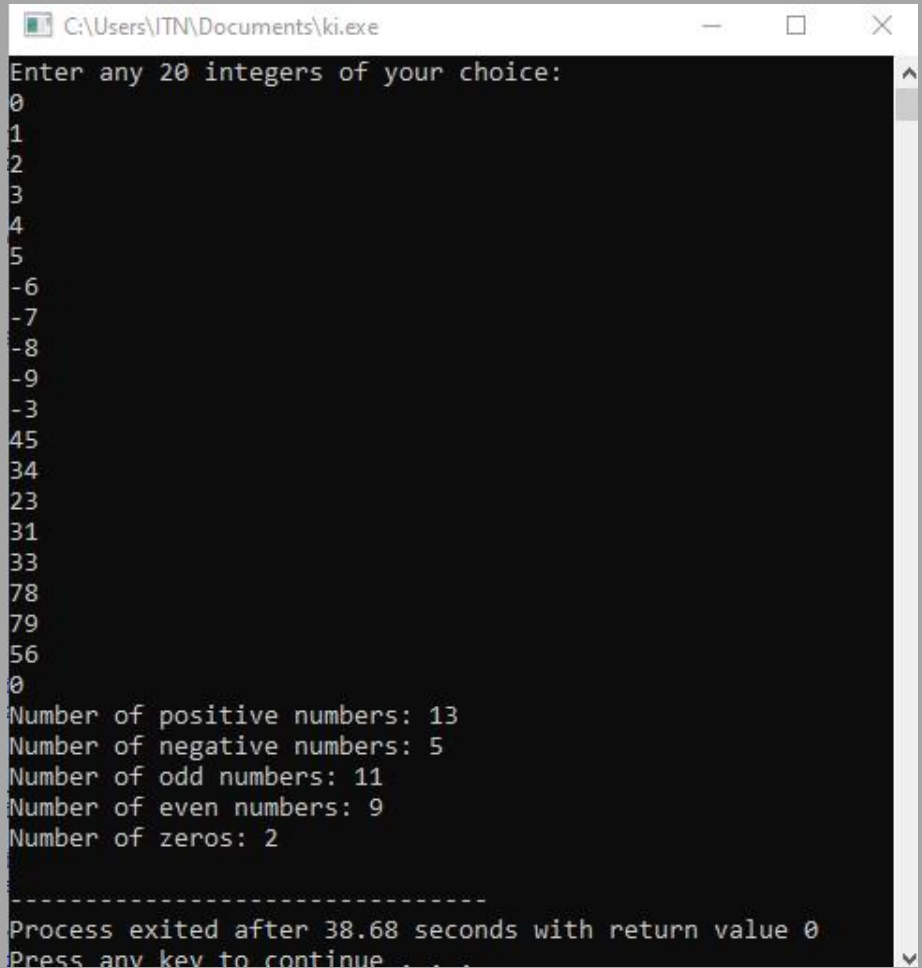
```
    cout << "Number of odd numbers: " << oddCount << endl;
```

```
    cout << "Number of even numbers: " << evenCount << endl;
```

```
    cout << "Number of zeros: " << zeroCount << endl;
```

```
    return 0;
```

```
}
```



```
C:\Users\ITN\Documents\ki.exe
Enter any 20 integers of your choice:
0
1
2
3
4
5
-6
-7
-8
-9
-3
45
34
23
31
33
78
79
56
0
Number of positive numbers: 13
Number of negative numbers: 5
Number of odd numbers: 11
Number of even numbers: 9
Number of zeros: 2
-----
Process exited after 38.68 seconds with return value 0
Press any key to continue . . .
```

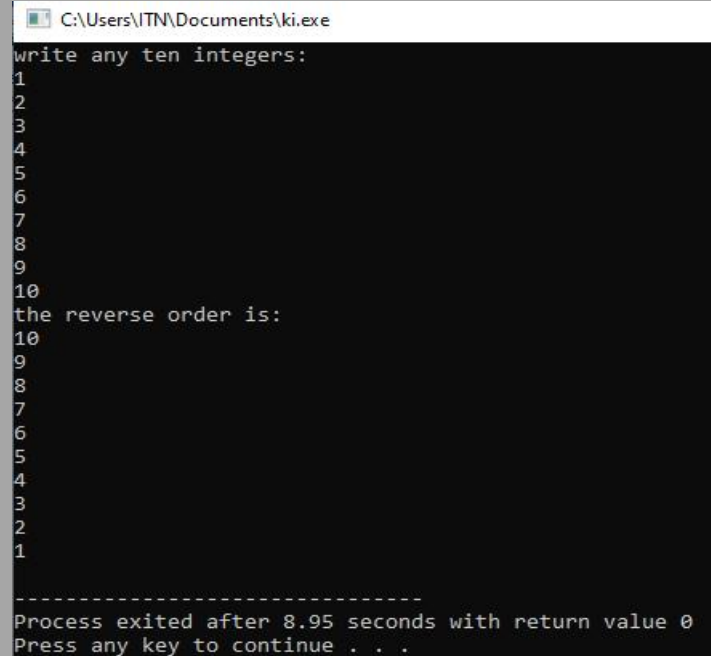
QUESTION NO 2

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;
}
```



The screenshot shows a Windows command prompt window titled "C:\Users\ITN\Documents\ki.exe". The program prompts the user to "write any ten integers:". The user enters the numbers 1 through 10, each on a new line. The program then outputs "the reverse order is:" followed by the numbers 10 through 1, each on a new line. At the bottom, it displays "Process exited after 8.95 seconds with return value 0" and "Press any key to continue . . .".

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;
}

```

```

C:\Users\ITN\Documents\ki.exe
Enter 10 integers, one at a time:
4
5
6
67
78
34
7
90
450
88
Largest element: 450
Smallest element: 4

-----
Process exited after 31.54 seconds with return value 0
Press any key to continue . . .

```

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;
}

```

```

C:\Users\ITN\Documents\ki.exe
Enter 5 integers, one at a time:
6
5
7
67
45
Sum of elements: 130
Product of elements: 633150

-----
Process exited after 14.92 seconds with return value 0
Press any key to continue . . .

```

QUESTION NO 5

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

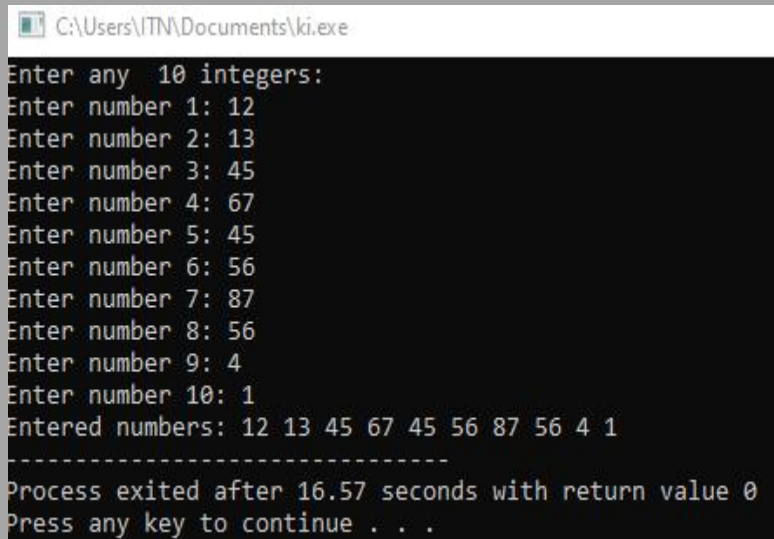
```
#include <iostream>
using namespace std;

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;
}
```



```
C:\Users\ITN\Documents\ki.exe
Enter any 10 integers:
Enter number 1: 12
Enter number 2: 13
Enter number 3: 45
Enter number 4: 67
Enter number 5: 45
Enter number 6: 56
Enter number 7: 87
Enter number 8: 56
Enter number 9: 4
Enter number 10: 1
Entered numbers: 12 13 45 67 45 56 87 56 4 1
-----
Process exited after 16.57 seconds with return value 0
Press any key to continue . . .
```

QUESTION NO 6

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

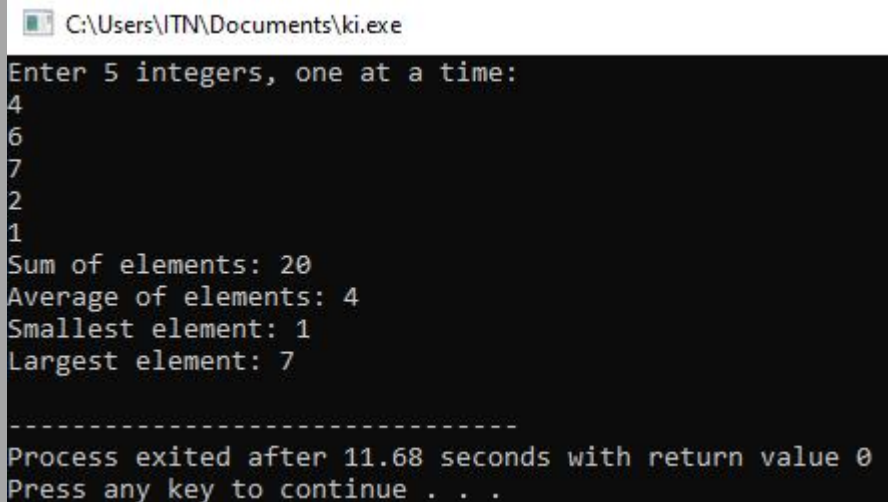
```
#include <iostream>
using namespace std;
void calculateStats(int arr[], int size, int &sum, double &average, int &smallest, int &largest) {
```

```
    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];
        }
    }
```



```
C:\Users\ITN\Documents\ki.exe
Enter 5 integers, one at a time:
4
6
7
2
1
Sum of elements: 20
Average of elements: 4
Smallest element: 1
Largest element: 7
-----
Process exited after 11.68 seconds with return value 0
Press any key to continue . . .
```

```
        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];
    }

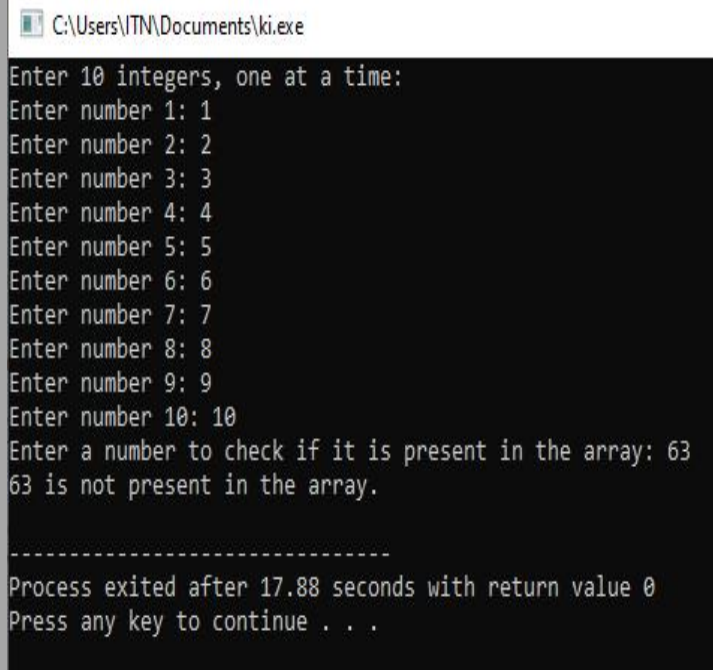
    int targetNumber;
    bool found = false;
    cout << "Enter a number to check if it is present in the array: ";
    cin >> targetNumber;

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

```

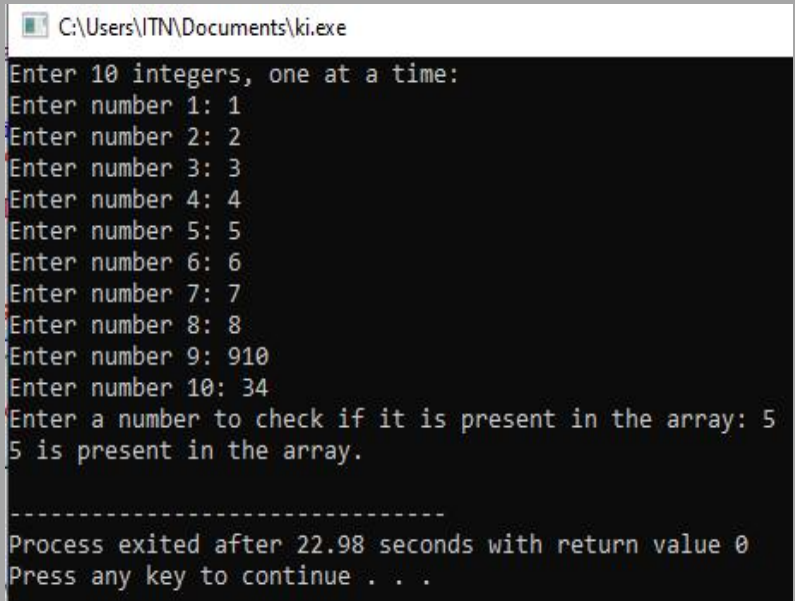
```
        cout << targetNumber << " is present in the array." << endl;
    } else {
        cout << targetNumber << " is not present in the array." << endl;
    }

    return 0;}
```



```
C:\Users\ITN\Documents\ki.exe
Enter 10 integers, one at a time:
Enter number 1: 1
Enter number 2: 2
Enter number 3: 3
Enter number 4: 4
Enter number 5: 5
Enter number 6: 6
Enter number 7: 7
Enter number 8: 8
Enter number 9: 9
Enter number 10: 10
Enter a number to check if it is present in the array: 63
63 is not present in the array.

-----
Process exited after 17.88 seconds with return value 0
Press any key to continue . . .
```



```
C:\Users\ITN\Documents\ki.exe
Enter 10 integers, one at a time:
Enter number 1: 1
Enter number 2: 2
Enter number 3: 3
Enter number 4: 4
Enter number 5: 5
Enter number 6: 6
Enter number 7: 7
Enter number 8: 8
Enter number 9: 910
Enter number 10: 34
Enter a number to check if it is present in the array: 5
5 is present in the array.

-----
Process exited after 22.98 seconds with return value 0
Press any key to continue . . .
```