

# IT161: Introduction to Programming and Problem Solving

## Lab 2/Assignment 2

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### PROGRAMS

#### 1. Printing special characters

##### Code:

```
#include <stdio.h>

int main(){

    printf("Special Characters 1 --> ");

    for(int i = 32; i <= 47;i++){

        printf(" %c",i);

    }

    printf("\n");

    printf("Special Characters 2 --> ");

    for(int i = 58; i <= 64;i++){

        printf(" %c",i);

    }

    printf("\n");

    printf("Special Characters 3 --> ");

    for(int i = 91; i <= 96;i++){

        printf(" %c",i);

    }

    printf("\n");
```

```

printf("Special Characters 4 --> ");
for(int i = 123; i <= 126;i++){
    printf(" %c",i);
}
printf("\n");
return 0;}

```

## Output:

```

Siddharth at ...\\IT101\\LAB2
./a.exe
Special Characters 1 ->      ! " # $ % & ' ( ) * + , - . /
Special Characters 2 ->      : ; < = > ? @
Special Characters 3 ->      [ \\ ] ^ _ `
Special Characters 4 ->      { | } ~

```

## 2. C Program to Check Leap Year

### Code:

```

#include <stdio.h>

int main(){

    int year;

    printf("\nEnter your to check: ");
    scanf("%d",&year);

    if(year%4 == 0){
        printf("\n%d is a leap year!\n",year);
    }
}

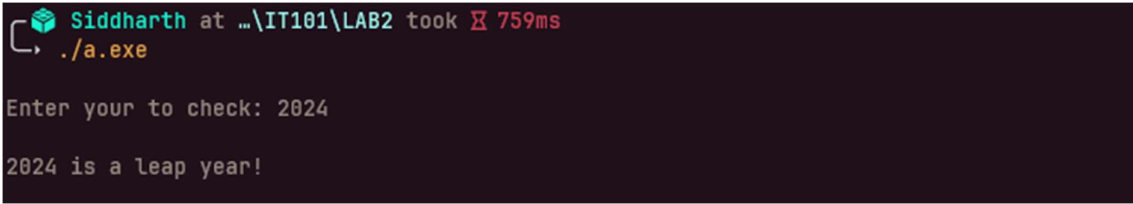
```

```

else if(year% 100 == 0 && year % 400 == 0){
    printf("\n%d is a leap year!\n",year);
}
else {
    printf("\n%d is not a leap year!\n",year);
}
return 0;
}

```

### Output:



```

Siddharth at ...\IT101\LAB2 took 759ms
./a.exe
Enter your to check: 2024
2024 is a leap year!

```

## 3. C Program to Find the Factorial

### Code:

```

#include <stdio.h>

int main(){
    int n;
    int fact = 1;
    printf("\nEnter your Number: ");
    scanf("%d",&n);
    for(int i = 1; i <= n;i++){
        fact = fact * i;}

    printf("\nThe factorial of %d is %d\n",n,fact);

    return 0;}

```

## Output:

```
Siddharth at ...\\IT101\\LAB2
./a.exe

Enter your Number: 6

The factorial of 6 is 720
```

## 4. C Program to Make a Simple Calculator

### Code:

```
#include <stdio.h>

#include <stdlib.h>

int main(){

    int operation;

    int a;

    int b;

    printf("\nEnter number 1: ");

    scanf("%d",&a);

    printf("\nEnter number 2: ");

    scanf("%d",&b);

    printf("\nSelect Operator: \n");

    printf("1.Add\n");

    printf("2.Subtract\n");

    printf("3.Multiply\n");

    printf("4.Divide\n");

    printf("\nWhat operations do you want to perform on %d and %d (1/2/3/4): ",a,b);
```

```

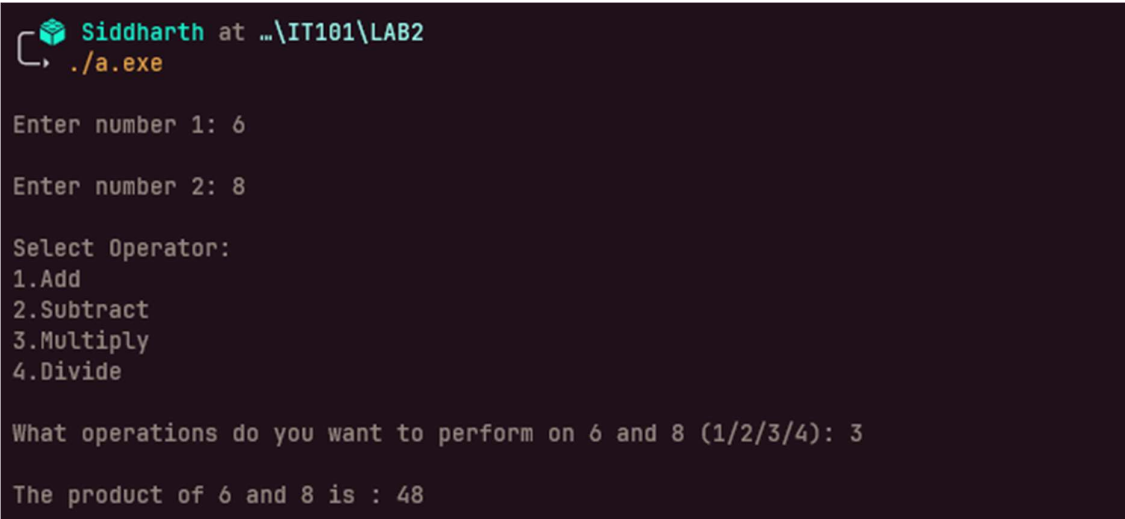
scanf("%d",&operation);

if(operation == 1){
    printf("\nThe sum of %d and %d is : %d\n",a,b,a+b);
}
else if(operation == 2){
    printf("\nThe diff of %d and %d is : %d\n",a,b,abs(a-b));
}
else if(operation == 3){
    printf("\nThe product of %d and %d is : %d\n",a,b,a*b);
}
else if(operation == 4){
    printf("\nThe Division of %d and %d is : %.2f\n",a,b,(float)a/(float)b);
}

return 0;
}

```

## Output:



```

Siddharth at ... \IT101\LAB2
./a.exe

Enter number 1: 6

Enter number 2: 8

Select Operator:
1.Add
2.Subtract
3.Multiply
4.Divide

What operations do you want to perform on 6 and 8 (1/2/3/4): 3

The product of 6 and 8 is : 48

```

## 5. C Program to Print Pyramid Pattern

### Code:

```
#include <stdio.h>

int main(){

    int n;

    printf("\nEnter No of rows: ");
    scanf("%d",&n);

    for(int i=1; i<=n ; i++){
        for(int j = 1; j <= i;j++){
            printf("*");
        }
        printf("\n");
    }

    return 0;
}
```

### Output:

```
Siddharth at ...\\IT101\\LAB2
./a.exe

Enter No of rows: 7
*
**
***
****
*****
*****
*****
```

## 6. C Program to Display Factors of a Number

### Code:

```
#include <stdio.h>

int main(){

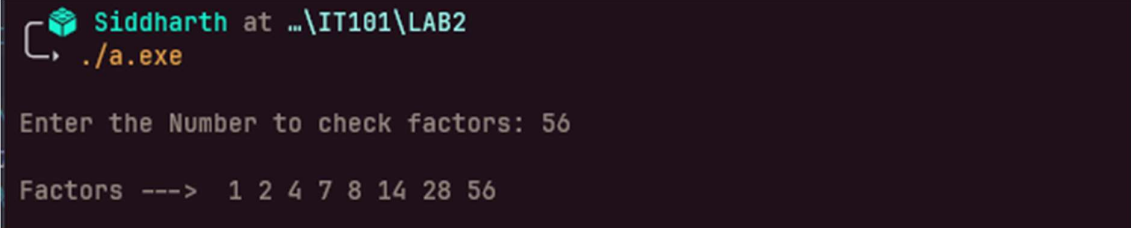
    int n;

    printf("\nEnter the Number to check factors: ");
    scanf("%d",&n);

    printf("\nFactors ---> ");
    for(int i = 1 ; i <= n ; i++){
        if(n%i==0){
            printf(" %d",i);
        }
    }
    printf("\n");

    return 0;
}
```

### Output:



```
Siddharth at ...\IT101\LAB2
./a.exe

Enter the Number to check factors: 56

Factors ---> 1 2 4 7 8 14 28 56
```

The screenshot shows a terminal window with a dark background. At the top, it displays the user 'Siddharth' at the location '...\\IT101\\LAB2'. Below that, the command './a.exe' is entered and executed. The program prompts 'Enter the Number to check factors: 56'. After the user enters '56', the program outputs 'Factors ---> 1 2 4 7 8 14 28 56'.

## 7. Store integers in an array

### Code:

```
#include <stdio.h>

int main(){

    int n;

    printf("\n how many numbers do you want to enter: ");

    scanf("%d",&n);

    int array[n];

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

        printf("\nEnter the %dth Number: ",i+1);

        scanf("%d",&array[i]);

    }

    printf("\nhere is your Final Array --> \n")

    for(int j; j<n ; j++){

        printf(" %d",array[j]);

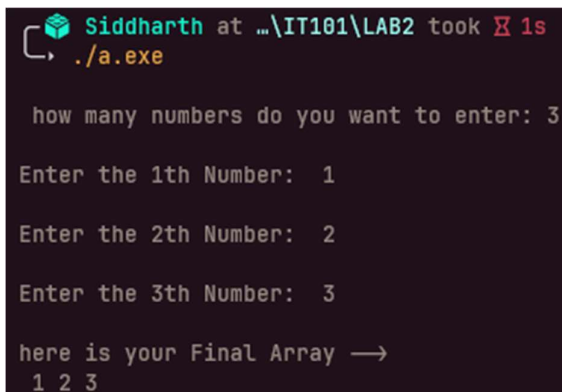
    }

    printf("\n");

    return 0;

}
```

### Output:



```
Siddharth at ...\IT101\LAB2 took 1s
./a.exe

how many numbers do you want to enter: 3

Enter the 1th Number: 1

Enter the 2th Number: 2

Enter the 3th Number: 3

here is your Final Array →
1 2 3
```



## 8. Finding min, max from integer array

### Code:

```
#include <stdio.h>

int main(){

    int array[] = {2,6,4,9,10,99,0};

    int great = array[0];

    int least = array[0];

    int len = sizeof(array)/sizeof(array[0]);

    for(int i = 1; i<= len ; i++){

        if (array[i] > great){

            great = array[i];

        }

    }

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

        if (array[i] < least){

            least = array[i];

        }

    }

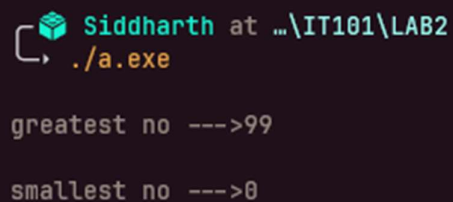
    printf("\ngreatest no --->%d\n",great);

    printf("\nsmallest no --->%d\n",least);

    return 0;

}
```

### Output:



```
Siddharth at ...\\IT101\\LAB2
./a.exe

greatest no --->99

smallest no --->0
```

## 9. Checking whether an array is in ascending or descending

### Code:

```
#include <stdio.h>

int main()

    int array[] = {10,9,7,4,2,1,0};

    int is_asc = 0;

    int is_dsc = 0;

    int len = sizeof(array)/sizeof(array[0]);

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

        if (array[i] < array[i+1]){

            is_asc += 1;

        }

        else if (array[i] > array[i+1]){

            is_dsc += 1;

        } }

    if(is_asc == len-1){

        printf("\nThe Array is in ascending order!\n");

    }

    else if(is_dsc == len-1){

        printf("\nThe Array is in desecnding order!\n");

    }

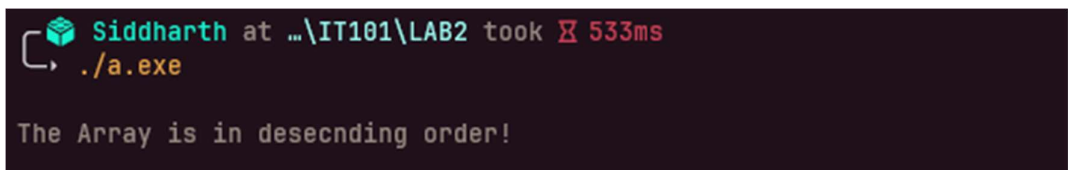
    else{

        printf("\nArray Not sorted!\n");

    }

    return 0; }
```

### Output:



```
Siddharth at ...\IT101\LAB2 took 533ms
./a.exe
The Array is in desecnding order!
```

## 10.Reverse the entries of an integer array

### Code:

```
#include <stdio.h>

int main(){

    int array[] = {3,6,4,9,10,98,54,77,22};
    int len = sizeof(array)/sizeof(array[0]);
    int reversed[len];

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

        reversed[i] = array[len-1-i];
    }
    int len_reversed = sizeof(reversed)/sizeof(reversed[0]);

    printf("\nhere is your Reversed Array --> \n");

    for(int j = 0; j < len_reversed; j++){
        printf(" %d",reversed[j]);
    }
    printf("\n");
    return 0;
}
```

### Output:

```
Siddharth at ...\\IT101\\LAB2 took 886ms
./a.exe

here is your Input Array →
3 6 4 9 10 98 54 77 22

here is your Reversed Array →
22 77 54 98 10 9 4 6 3
```