

```
    return None # Input language could not be determined
    parsedInput = self.parseInputFromContext() # Parses input from context
    if not parsedInput or not self.model: # If model is not initialized
        return None
    context.append(parsedInput) # Add new conversation entry to context
    return (self.model.generateResponse(parsedInput), context)

def parseInputToLanguageModel(self, inputString, inputLanguage, context):
    if self.model is None or self.model.language != inputLanguage:
        # LLM is not initialised or has wrong language, load LLM
        self.model = self.loadAILanguageModel(inputLanguage)
        if self.model is None or not self.model.isModelLoaded():
            raise Exception("AI language model load failed")
        return None
    self.model.setLLMContext(context) # Put past conversation entries into LLM
    llmInputParser = self.model.getInputParser()
    return llmInputParser.parseInput(inputString)

def generateResponse(self, parsedInput):
    self.model.setLLMContext(parsedInput)
    return self.model.generateResponse(parsedInput)
```

# PROGRAMMING FUNDAMENTALS

LAB TASK

Name: Mohsin Ali  
Roll Number: 25P-0545  
Section: BCS-1C

## QUESTION# 01

**Write a program to take range from user starting number and ending number), count the number fizz, Buzz and Fizz-Buzz, in the given range**

**Fizz In Multiple of 3**

**Buzz is Multiple of 5**

**Fizz-Buzz is Multiple of 3 and 5**

The screenshot shows the Dev-C++ IDE interface. On the left is the code editor with the file 'task1.cpp' containing C++ code for the FizzBuzz problem. On the right is the terminal window showing the execution of the program and its output.

```
1 //Mohsin Ali
2 //25P-0545
3
4 #include <stdio.h>
5
6 int main()
7 {
8     printf("NAME: Mohsin Ali\nRoll Number: 25P-0545");
9     int r1,r2,fz=0,bz=0,fbz=0;
10    printf("Enter Starting Number: ");
11    scanf("%d",&r1);
12    printf("Enter Ending Number: ");
13    scanf("%d",&r2);
14
15    for(int i=r1;i<=r2;i++){
16        if((i%3==0){
17            fz++;
18        }
19        if((i%5==0){
20            bz++;
21        }
22        if((i%3==0 && i%5==0){
23            fbz++;
24        }
25    }
26
27    printf("FIZZ = %d\nBUZZ = %d\nFIZZ-BUZZ = %d",fz,bz,fbz);
28 }
```

Output window:

```
NAME: Mohsin Ali
Roll Number: 25P-0545
Enter Starting Number: 15
Enter Ending Number: 15
FIZZ = 5
BUZZ = 3
FIZZ-BUZZ = 1
Process exited after 7.138 seconds with return value 0
Press any key to continue . . .
```

```
//Mohsin Ali
//25P-0545
#include <stdio.h>
int main(){
printf("NAME: Mohsin Ali\nRoll Number: 25P-0545\n");
int r1,r2,fz=0,bz=0,fbz=0;
printf("Enter Starting Number: ");
scanf("%d",&r1);
printf("Enter Ending Number: ");
scanf("%d",&r2);

for(int i=r1;i<=r2;i++){
if(i%3==0){
    fz++;
}
if((i%5==0){
    bz++;
}
if((i%3==0 && i%5==0){
    fbz++;
}

if(i%3==0 && i%5==0){
    fbz++;
}

printf("FIZZ = %d\nBUZZ = %d\nFIZZ-BUZZ = %d",fz,bz,fbz);
}
```

## QUESTION# 02

**Write a program that will generate the Fibonacci series up to 10000.**

**Also find the sum of the generated Fibonacci numbers divisible by 3, 5 or 7 only.**

**An example of the Fibonacci series is:**

**1 1 2 3 5 8 13 21.....**

**Note: Do this task by using a for loop DO NOT use arrays for this.**

The screenshot shows the Dev-C++ IDE interface. On the left, the code editor displays 'task1.cpp' and 'task2.cpp'. The code is as follows:

```
task1.cpp task2.cpp
1 //Mohsin Ali
2 //25P-0545
3
4 #include <stdio.h>
5 int main(){
6     printf("NAME: Mohsin Ali\nRoll Number: 25P-0545");
7     int a=0,b=1,fab=1,sum=0;
8
9     for(int i=1;i<10;i++){      // after many turns it will exceed int range and
10         fab=a+b;
11         printf("%d ",b);
12         if(b%3==0 || b%5==0 || b%7==0){
13             sum+=b;
14         }
15         a=b;
16         b=fab;
17     }
18 }
19 printf("\nSum = %d",sum);
20
21
22
```

On the right, the terminal window shows the execution output:

```
NAME: Mohsin Ali
Roll Number: 25P-0545
1 1 2 3 5 8 13 21 34 55
Sum = 84
Process exited after 0.09659 seconds with return value 0
Press any key to continue . . .
```

```
//Mohsin Ali
//25P-0545

#include <stdio.h>
int main(){
printf("NAME: Mohsin Ali\nRoll
Number: 25P-0545\n");
int a=0,b=1,fab=1,sum=0;

for(int i=1;i<=10;i++){
    /* after many turns it will
    exceed int range and then it will print
    garbage values */

    fab=a+b;
    printf("%d ",b);
    if(b%3==0 || b%5==0 || b%7==0){
        sum+=b;
    }
    a=b;
    b=fab;
}

printf("\nSum = %d",sum);}
```

### QUESTION# 03

Write a C Program to compute the LCM and GCD of two numbers.

The screenshot shows the Dev-C++ IDE interface. On the left, the code editor displays a file named task3.cpp with the following content:

```
1 //Mohsin Ali
2 //25P-0545
3
4 #include <stdio.h>
5
6 int main(){
7     printf("NAME: Mohsin Ali\nRoll Number: 25P-0545\n");
8     int n1,n2,temp,gcd,lcm;
9     int x,y;
10    printf("Enter Num1: ");
11    scanf("%d",&n1);
12    printf("Enter Num2: ");
13    scanf("%d",&n2);
14
15    x=n1,y=n2;
16    while(n2!=0){
17        temp=n2;
18        n2=n1%n2;
19        n1=temp;
20    }
21    gcd=n1;
22    lcm=(x*y)/gcd;
23
24
25
26
27 }
```

On the right, the terminal window shows the output of the program:

```
NAME: Mohsin Ali
Roll Number: 25P-0545
Enter Num1: 4
Enter Num2: 16
LCM = 16
GCD = 4
Process exited after 10.38 seconds with return value 0
Press any key to continue . . .
```

```
//Mohsin Ali
//25P-0545

#include <stdio.h>

int main(){

printf("NAME: Mohsin Ali\nRoll
Number: 25P-0545\n");

int n1,n2,temp,gcd,lcm;

int x,y;

printf("Enter Num1: ");

scanf("%d",&n1);

printf("Enter Num2: ");

scanf("%d",&n2);

x=n1,y=n2;

while(n2!=0){

temp=n2;

n2=n1%n2;

n1=temp;

}

gcd=n1;

lcm=(x*y)/gcd;

printf("LCM = %d\nGCD = %d",lcm,gcd);

}
```

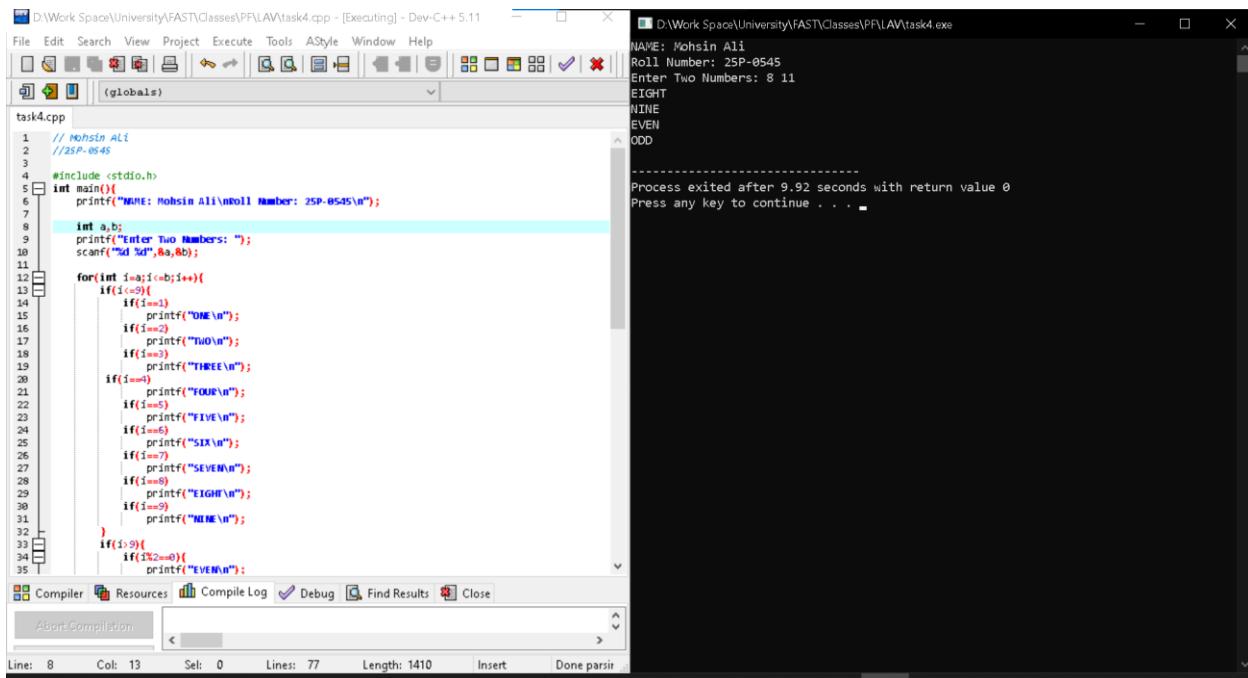
## **QUESTION# 04**

**Consider Two integers a and b taken as input from the user.**

**Using Loops iterate the value of  
a till the value of b.**

If the value of  $a <= 9$   
the output should correspond  
to the English representation of the  
numbers i.e., 8=Eight, 9=Nine etc.

If the iteration exceeds 9 then the programs should print if the exceeded number is even or odd.



## Source Code:

```
// Mohsin Ali
//25P-0545
#include <stdio.h>

int main(){
    printf("NAME: Mohsin Ali\nRoll Number: 25P-0545\n");

    int a,b;
    printf("Enter Two Numbers: ");
    scanf("%d %d",&a,&b);
    for(int i=a;i<=b;i++){
        if(i<=9){
            if(i==1)
                printf("ONE\n");
            if(i==2)
                printf("TWO\n");
            if(i==3)
                printf("THREE\n");
            if(i==4)
                printf("FOUR\n");
            if(i==5)
                printf("FIVE\n");
            if(i==6)
                printf("SIX\n");
            if(i==7)
                printf("SEVEN\n");
            if(i==8)
                printf("EIGHT\n");
            if(i==9)
                printf("NINE\n");
        }
        if(i>9){
            if(i%2==0){
                printf("EVEN\n");
            }else{
                printf("ODD\n");
            }
        }
    }
    return 0;
}
```

## Another Method to solve this Task

The screenshot shows the Dev-C++ IDE interface. On the left, the code editor displays `task4.cpp` with C++ code. On the right, the terminal window shows the program's output after running `task4.exe`. The terminal output reads:

```
D:\Work Space\University\FAST\Classes\PR\LA\Task4.exe
Enter Two Numbers: 8 11
EIGHT
ODD
Process exited after 11.17 seconds with return value 0
Press any key to continue . . .
```

//Mohsin Ali

//25P-0545

```
#include <stdio.h>
int main(){
    int a,b;
    printf("Enter Two Numbers: ");
    scanf("%d %d",&a,&b);

    for (int i=a; i <= b; i++) {
        if (i == a || i == b) {
            if (i <= 9) {
                if (i == 1) printf("ONE\n");
                if (i == 2) printf("TWO\n");
                if (i == 3) printf("THREE\n");
                if (i == 4) printf("FOUR\n");
                if (i == 5) printf("FIVE\n");
                if (i == 6) printf("SIX\n");
                if (i == 7) printf("SEVEN\n");
                if (i == 8) printf("EIGHT\n");
                if (i == 9) printf("NINE\n");
            }
            else {
                if (i%2 == 0)
                    printf("EVEn\n");
                else
                    printf("ODD\n");
            }
        }
    }
}
```

## QUESTION#05

**Write a C program that uses  
one-dimensional array name  
daily\_temp to store one-  
week temperature reading.**

**Declare array with size of 7**

**e.g., {15,28,35,30,12,25,40}**

**Classify temperature using these  
parameters**

**Cold day >>> temp<=20**

**Mild day >>> temp>20**

**and temp <35**

**Hot day >>> temp>=35**

**Count number of Cold, mild and hot day**

//Mohsin Ali

//25P-0545

```
#include <stdio.h>

int main(){

    int size=7;

    int
    temp[size]={15,25,30,33,11,23,43};

    int cold=0,mild=0,hot=0;
```

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

    if(temp[i]<=20)

        cold++;

    if(temp[i]>20 && temp[i]<35)

        mild++;

    if(temp[i]>=35)

        hot++;

}
```

```
printf("Total Cold Day (<=20) = %d\nTotal Mild Day (20 - 35) = %d\nTotal Hot Day (>35) = %d",cold,mild,hot);
```

The screenshot shows two windows from the Dev-C++ IDE. The left window displays the source code for task5.cpp, which includes a main function that declares an array of size 7 with values 15, 25, 30, 33, 11, 23, and 43. It then iterates through the array to count the number of cold, mild, and hot days based on the specified thresholds. The right window shows the output of the program, which prints the counts for each category: Total Cold Day (<=20) = 2, Total Mild Day (20 - 35) = 4, and Total Hot Day (>35) = 1. A message at the bottom indicates the process exited after 0.1352 seconds with return value 0, and prompts the user to press any key to continue.

```
1 #include <stdio.h>
2 int main(){
3     int size;
4     int temp[size]={15,25,30,33,11,23,43};
5     int cold=0,mild=0,hot=0;
6
7     for(int i=0;i<size;i++){
8         if(temp[i]<=20)
9             cold++;
10        if(temp[i]>20 && temp[i]<35)
11            mild++;
12        if(temp[i]>=35)
13            hot++;
14    }
15
16    printf("Total Cold Day (<=20) = %d\nTotal Mild Day (20 - 35) = %d\nTotal Hot Day (>35) = %d",cold,mild,hot);
17
18 }
```

## QUESTION# 06

Write a C program that produces  
the following output:

0 0 0 0

1 1

2 2 2 2

3 3

4 4 4 4

5 5

6 6 6 6

// Mohsin Ali

//25P-0545

```
#include <stdio.h>
```

```
int main(){
```

```
printf("NAME: Mohsin Ali\nRoll  
Number: 25P-0545\n");
```

```
int i=0;
```

```
while(i<=6){
```

```
printf(" %d\t%d\t%d\t%d\t%d\n",i,i,i,i);
```

```
if(i+1<=6){
```

```
printf(" %d\t%d\t%d\t%d\n",i+1,i+1);
```

```
}
```

```
i+=2;
```

```
}
```

```
}
```

The screenshot shows the Dev-C++ IDE interface. On the left, the code editor displays the file `task6.cpp` with the following content:

```
1 // Mohsin Ali
2 //25P-0545
3
4 #include <stdio.h>
5 int main(){
6     printf("NAME: Mohsin Ali\nRoll Number: 25P-0545\n");
7
8     int i=0;
9
10    while(i<=6){
11        printf(" %d %d %d %d %d\n",i,i,i,i);
12        if(i+1<=6){
13            printf(" %d %d %d %d\n",i+1,i+1);
14        }
15    }
16    i+=2;
17 }
18 }
```

The right window shows the terminal output of the program's execution:

```
NAME: Mohsin Ali
Roll Number: 25P-0545
0 0 0 0 0
1 1
2 2 2 2
3 3
4 4 4 4
5 5
6 6 6 6
-----
Process exited after 0.1012 seconds with return value 0
Press any key to continue . . .
```

## QUESTION# 07

**Write a C Program that takes a user  
input array and prints the sum of its elements.**

The screenshot shows two windows from the Dev-C++ IDE. The left window is the code editor for 'task7.cpp' containing the C program. The right window is the terminal window for 'task7.exe' showing the execution of the program.

```
task6.cpp task7.cpp
1 // Mohsin Ali
2 //25P-0545
3
4 #include <stdio.h>
5 int main(){
6
7     int size,sum=0;
8     printf("Enter Array Size: ");
9     scanf("%d",&size);
10    int arr[size];
11
12    for(int i=0;i<size;i++){
13        printf("Enter Value: ");
14        scanf("%d",&arr[i]);
15        sum+=arr[i];
16    }
17    printf("SUM: %d",sum);
18 }
```

D:\Work Space\University\FAST\Classes\PR\LA\task7.cpp - [Executing] - Dev-C++ 5.11

D:\Work Space\University\FAST\Classes\PR\LA\task7.exe

```
File Edit Search View Project Execute Tools AStyle Window Help
File Edit View Project Execute Tools Window Help
(globals) Enter Array Size: 5
Enter Value: 1
Enter Value: 2
Enter Value: 3
Enter Value: 4
Enter Value: 5
SUM: 15
-----
Process exited after 9.949 seconds with return value 0
Press any key to continue . . .
```

// Mohsin Ali

//25P-0545

```
#include <stdio.h>
int main(){
    int size,sum=0;
    printf("Enter Array Size: ");
    scanf("%d",&size);
    int arr[size];
    for(int i=0;i<size;i++){
        printf("Enter Value: ");
        scanf("%d",&arr[i]);
        sum+=arr[i];
    }
    printf("SUM: %d",sum);
}
```

## QUESTION# 08

**Write a program in C to read n number of values in an array and display it in reverse order.**

The screenshot shows two windows from the Dev-C++ IDE. The left window displays the source code for task8.cpp, which includes a main function that reads an array size and values, then prints them in reverse. The right window shows the execution of the program, where the user enters an array size of 5 and five values (2, 3, 4, 5, 6). The program then outputs the array in reverse order (6, 5, 4, 3, 2).

```
#include <stdio.h>
int main(){
    int size;
    printf("Enter Array Size: ");
    scanf("%d",&size);
    int arr[size];
    for(int i=0;i<size;i++){
        printf("Enter Value: ");
        scanf("%d",&arr[i]);
    }
    printf("\nARRAY IN REVERSE ORDER:\n");
    for(int j=size-1;j>=0;j--){
        printf("%d ",arr[j]);
    }
}
```

```
#include <stdio.h>
int main(){
    int size;
    printf("Enter Array Size: ");
    scanf("%d",&size);
    int arr[size];
    for(int i=0;i<size;i++){
        printf("Enter Value: ");
        scanf("%d",&arr[i]);
    }
    printf("\nARRAY IN REVERSE ORDER:\n");
    for(int j=size-1;j>=0;j--){
        printf("%d ",arr[j]);
    }
}
```