 **COMSATS University Islamabad**

**Department of Computer Engineering**

**LAB #1**

**Programming Fundamentals**

**Introduction to Development Tools, Basics of C Programming and Debugging**

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Date Of Submission:17th Feb 2025

**Objective:**

* Learn to use IDE such as Code Blocks for compiling and debugging computer programs written in C language.

**Lab task 1:**

**Lab Task 1: Fix syntax errors in given C program.**

Make a new C project (console application) using Code Blocks and type the following code in the main.c file. Build the code, fix the indicated errors, and run it.

**Program:**

#include <stdio.h>

#include <stdlib.h>

int main()

{

int n=0 ;

printf("enter the number: \n");

scanf("%d", &n);

printf("You entered: %d\n", n);

int r = 0;

int x = 0;

x = n-1;

r = n;

do

{

r = r \* x;

x = x-1;

}while(x>=1);

7908

return 0;

}

**Result:**

enter the number:

6

You entered: 6

The factorial of number is: 720

**Lab task 2:**

**Solving a piece-wise function**

𝑛, 𝑛 

𝑛 , 

𝑓𝑛, 𝑛

𝑛 𝑖𝑠 𝑎𝑛 𝑖𝑛𝑡𝑒𝑔𝑒𝑟

Fill the table using the above equation for values of n from -20 to 20. You will be using this table to compare the output of the program in the next task and fixing some logical errors.

|  |  |  |  |
| --- | --- | --- | --- |
| **n** | **F[n]** | **n** | **F[n]** |
| -20 | 500 | 1 | -49 |
| -19 | 456 | 2 | -92 |
| -18 | 414 | 3 | -123 |
| -17 | 374 | 4 | -136 |
| -16 | 336 | 5 | -125 |
| -15 | 300 | 6 | -84 |
| -14 | 266 | 7 | -7 |
| -13 | 234 | 8 | 112 |
| -12 | 204 | 9 | 279 |
| -11 | 176 | 10 | 500 |
| -10 | 150 | 11 | 781 |
| -9 | 10 | 12 | 1128 |
| -8 | 11 | 13 | 1547 |
| -7 | 12 | 14 | 2044 |
| -6 | 13 | 15 | 2625 |
| -5 | 14 | 16 | 3297 |
| -4 | 15 | 17 | 4063 |
| -3 | 16 | 18 | 4932 |
| -2 | 92 | 19 | 5909 |
| -1 | 49 | 20 | 7000 |

**Lab task 3:**

#include <stdio.h>

#include <stdlib.h>

int main()

{

int range\_min = -20;

int range\_max = 20;

int n;

int output;

printf("For the range -20 to 20, ", range\_min, range\_max);

printf("The output of the function is: \n");

for(n=range\_min; n<=range\_max; n++)

{

if(n <= -10)

{

output = (n\*n) - (5\*n);

}

else if(n>=-2)

{

output = (n\*n\*n) - (50\*n);

}

else

{

output = n + 19;

}

printf("%d ", output);

}

printf("\n\n");

return 0;

}

**Lab task 4:**

Modify the above C program for the following piecewise function and report the problems you face. Use integer variables for your program.

−𝑛 − 4, 𝑛 

 𝑛2 − 7,

𝑓[𝑛] = 120/n + 𝑛, 𝑛 

**Program:**

#include <stdio.h>

#include <stdlib.h>

int main()

{

int range\_min = -20;

int range\_max = 20;

int n;

int output;

printf("For the range -20 to 20, ", range\_min, range\_max);

printf("The output of the function is: \n");

for(n=range\_min; n<=range\_max; n++)

{

if(n < 3)

{

output = -n - 4;

}

else if(n > 10)

{

output = (n\*n) - 7;

}

else

{

output = (120/n) + n;

}

printf("%d ", output);

}

printf("\n\n");

return 0;

}

**Result:**

16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0, -1, -2, -3, -4, -5, -6, 43, 34, 29, 26, 24, 23, 22, 22, 114, 137, 162, 189, 218, 249, 282, 317, 354, 393.

**Conclusion:**

In this lab, we mainly found and corrected logical and syntax errors in C programming manually as well as using debugger.