Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Hingna Road, Wanadongri, Nagpur - 441 110

NAAC A++

Ph.: 07104-237919, 234623, 329249, 329250 Fax: 07104-232376, Website: www.ycce.edu

Department of Computer Technology B. Tech in Computer Science and Engineering (IOT)

Vision of the Department

To be a well-known centre for pursuing computer education through innovative pedagogy, value-based education and industry collaboration.

Mission of the Department

To establish learning ambience for ushering in computer engineering professionals in core and multidisciplinary area by developing Problem-solving skills through emerging technologies.

Session 2025-2026

Vision: Dream of where you want.	**Mission:** Means to achieve Vision

Program Educational Objectives of the program (PEO): (broad statements that describe the professional and career accomplishments)

PEO1	**Preparation**	**P: Preparation**	**Pep-CL abbreviation pronounce as Pep-si-lL easy to recall**
PEO2	**Core Competence**	**E: Environment (Learning Environment)**	
PEO3	**Breadth**	**P: Professionalism**	
PEO4	**Professionalism**	**C: Core Competence**	
PEO5	**Learning Environment**	**L: Breadth (Learning in diverse areas)**	

Program Outcomes (PO): (statements that describe what a student should be able to do and know by the end of a program)

Keywords of POs:

Engineering knowledge, Problem analysis, Design/development of solutions, Conduct Investigations of Complex Problems, Engineering Tool Usage, The Engineer and The World, Ethics, Individual and Collaborative Team work, Communication, Project Management and Finance, Life-Long Learning

PSO Keywords: Cutting edge technologies, Research

"I am an engineer, and I know how to apply engineering knowledge to investigate, analyse and design solutions to complex problems using tools for entire world following all ethics in a collaborative way with proper management skills throughout my life." *to contribute to the development of cutting-edge technologies and Research*.

Integrity: I will adhere to the Laboratory Code of Conduct and ethics in its entirety.

Name and Signature of Student and Date
Raunit R Moon
01-09-2025
(Signature and Date in Handwritten)

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Session	2024-25 (ODD)	Course Name	Computer Workshop Lab
Semester	3	Course Code	23IOT1306
Roll No	70	Name of Student	Raunit R Moon

Practical Number	**5**
Course Outcome	1. Understand the fundamentals of computer hardware and working of Linux operating system 2. Use Linux commands to manage files and file systems 3. Execute Scripts 4. Debug Programs on various IDEs
Aim	**Debugging using gdb debugger**
Problem Definition	A c program is to written to calculate the factorial of the number using recursion the program contain a logical errors that produce incorrect output.
Theory (100 words)	Debugging is process of identifying and solving the errors in any code in a software and the hardware. Debugging involves certain steps for the identification ,detection and solution for the particular error in the code. [1] The steps are as follows: 1. Identification of bugs : In this process, identification of bugs is implemented by accessing every line of code and testing them. [2] 2. Examing the bugs: In this process, there is a examining of the part of the error in the code and which part of the code is affected, this way it priortize the part to be corrected first and makes a plan for fixing the code. [3]

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	3. Solving the bugs: After examining the code, make the necessary correction in the code.[4] GDB stands for GNU Debugger which is a debugging tool for C as well as C++ language code. It helps us to see what happens when a code crashes and used to correct the bugs and error.[5]
Procedure and Execution (100 Words)	Steps for implementation: Steps for implementation: 1 .Understand the concept: Factorial of a number means multiplying it by every number below it down to 1. For example, $5! = 5 \times 4 \times 3 \times 2 \times 1$. 2. Set up your function: Create a function that calls itself—this is recursion. It should keep reducing the number by I until it reaches 0 or 1. 3. Include a base case: This is crucial. Without it, the function will keep calling itself forever. So, if the number is 0 or l, return l . 4. Handle user input: Ask the user to enter a number, and make sure it's not negative (since factorials for negative numbers aren't defined). Display the result: Call your recursive function and print the result to the screen.

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```
iot1@localhost:~

[iot1@localhost ~]$ vi fact.c
\[iot1@localhost ~]$ gcc fact.c
[iot1@localhost ~]$ ./a.out
Enter a number : 5
Factorial of 5 is 0
[iot1@localhost ~]$
```

Code:

```c
iot1@localhost:~ — /usr/bin/vim fact.c

#include<stdio.h>

int factorial(int n){
        if(n == 0){
                return 0;
        }
        else{
                return n * factorial(n-1);
        }
}

int main(){
        int num;
        printf("Enter a number : ");
        scanf("%d",&num);
        printf("Factorial of %d is %d\n",num,factorial(num));
        return 0;
}
~
~
~
~
~
"fact.c" 18L, 251B                          5,10-24        All
```

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```c
#include<stdio.h>

int factorial(int n){
        if(n == 0){
                return 1;
        }
        else{
                return n * factorial(n-1);
        }
}

int main(){
        int num;
        printf("Enter a number : ");
        scanf("%d",&num);
        printf("Factorial of %d is %d\n",num,factorial(num));
        return 0;
}
```

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Output:

```
iot1@localhost:~

[iot1@localhost ~]$ vi fact.c
[iot1@localhost ~]$ gcc fact.c
[iot1@localhost ~]$ ./a.out
Enter a number : 5
Factorial of 5 is 120
[iot1@localhost ~]$ █
```

Link of student Github profile where lab assignment has been uploaded	https://github.com/raunitmoon
Conclusion	Debugging using gdb debugger is studied and executed successfully.

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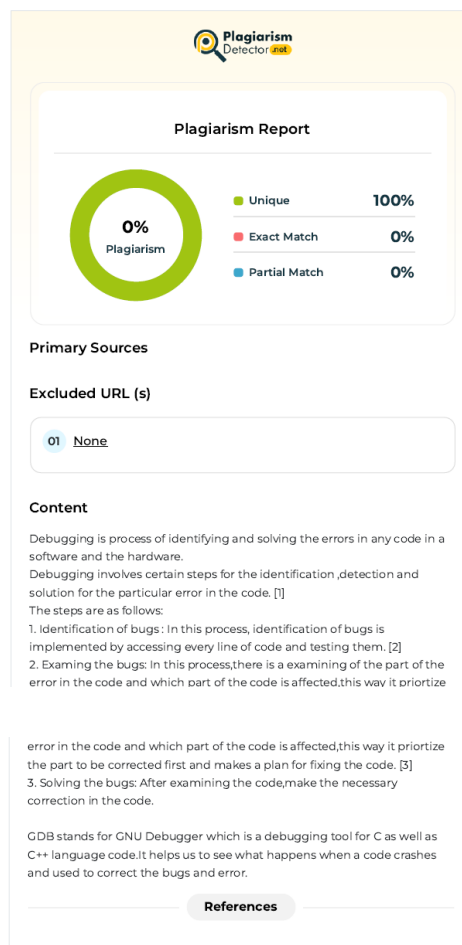
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Plag Report (Similarity index < 12%)	
	Plagiarism Report 0% Plagiarism Unique 100% Exact Match 0% Partial Match 0% **Primary Sources** **Excluded URL (s)** 01 None **Content** Debugging is process of identifying and solving the errors in any code in a software and the hardware. Debugging involves certain steps for the identification ,detection and solution for the particular error in the code. [1] The steps are as follows: 1. Identification of bugs : In this process, identification of bugs is implemented by accessing every line of code and testing them. [2] 2. Examing the bugs: In this process,there is a examining of the part of the error in the code and which part of the code is affected,this way it priortize error in the code and which part of the code is affected,this way it priortize the part to be corrected first and makes a plan for fixing the code. [3] 3. Solving the bugs: After examining the code,make the necessary correction in the code. GDB stands for GNU Debugger which is a debugging tool for C as well as C++ language code.It helps us to see what happens when a code crashes and used to correct the bugs and error. **References**
Date	**01-09-2025**