SUMMER INTERNSHIP PROJECT

REPORT

on

C++ PROGRAMMING

Performed at – **CODSOFT**

From July 2023 – August 2023

SUBMITTED TO:

University School Of Information,
Communication & Technology,
GGSIPU, Sector 16C, Dwarka, Delhi

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ACKNOWLEDGEMENT

I just wanted to take a moment to express my utmost gratitude to all the amazing individuals who played a pivotal role in helping me successfully complete my web development internship at Codsoft. First and foremost, I want to express my utmost gratitude to Codsoft for providing me with this incredibly valuable internship opportunity. The guidance, support, and encouragement they provided throughout the program were invaluable.

They totally helped me level up my skills and knowledge by, like, a ton. Dude, it's been like, the most rewarding and motivational experience ever, you know? This experience has been truly transformative, man. The projects I've been working on during this internship have been super important in helping me achieve my goal of successfully finishing this journey. The obstacles I've encountered throughout my internship have really helped me cultivate my problem-solving abilities, resilience, and a solid work ethic. These experiences have been super valuable and have totally helped me grow professionally. Plus, they've totally prepared me to crush it in my career and personal life going forward. I just wanted to take a moment to express my immense gratitude to my family and friends for their unwavering support and encouragement. The unwavering faith they had in me was a major driving force that kept me motivated and laser-focused during the entire duration of my internship. I just wanted to express my sincere gratitude to all the amazing individuals who played a pivotal role in making this internship an incredibly enriching and unforgettable experience.

ABOUT ORGANISATION

CodSoft offers cutting-edge IT consulting and services. Their love for technology and the transformative potential of software inspires us to create innovative solutions for businesses. With our influential internship program, we proactively invest in the future. At CodSoft, they understand that having real-world experience is essential for success in the technology industry.

For those students who lack core abilities, they bridge the gap through hands-on learning through live projects and realworld applications. Their staff is made up of professionals from the industry who are committed to giving interns the knowledge and abilities they need to succeed in their professions. They create a welcoming and encouraging atmosphere that stimulates learning, growth, and creativity.

DECLARATION

I, Gopal Krushna Panda, bearing roll no 05116403221, student of B.Tech of computer science and engineering department hereby declare that I own the full responsibility for the information, results etc. provided in this PROJECT titled “C++ Programming” submitted to USICT, GGSIPU as Summer Internship for 5th Semester. I have taken care in all respect to honour the I intellectual property right and have acknowledged the contribution of others for using them in academic purpose and further declare that in case of any violation of intellectual property right or copyright I, as a candidate, will be fully responsible for the same. Our supervisor should not be held responsible for full or partial violation of copyright or intellectual property rights.

GOPAL KRUSHNA PANDA

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INTRODUCTION

During my internship at Codsoft, I delved into the realm of C++ programming, a language widely acclaimed in the field of software development for its versatility and robust capabilities. The primary focus of my internship revolved around the conceptualization and implementation of four distinct programs: the Number Guessing Game, Simple Calculator, Tic-Tac-Toe Game, and To-Do List. The Number Guessing Game aimed to enhance logical thinking by generating random numbers and prompting users to guess them, incorporating features like user input validation and score tracking. The Simple Calculator project focused on basic arithmetic operations, fostering an understanding of user input handling, error validation, and simple mathematical calculations. The Tic-Tac-Toe Game was designed to create an interactive gaming experience with two-player functionality and win/lose/draw conditions, providing insights into array usage and iterative loops. The ToDo List project, on the other hand, sought to create a task management system with features like adding, updating, and deleting tasks, along with priority sorting, thereby emphasizing data structure implementation and file handling. Each project was crafted not only to bolster proficiency in C++ syntax but also to develop problem-solving skills through the practical application of fundamental programming concepts. The challenges encountered during the internship, ranging from debugging to logical error resolution, provided invaluable opportunities for growth and learning.

My internship at Codsoft was a journey of exploration and skill development, where the practical implementation of C++ in diverse projects significantly contributed to my understanding of software development. This report aims to shed light on the multifaceted experiences and achievements accrued during my tenure at Codsoft, showcasing the practical and applicable aspects of my coding endeavours.

PROJECTS

1)The Number Guessing Game :

The Number Guessing Game, a pivotal project undertaken during my internship at Codsoft, served as an application of fundamental programming principles and logic within the C++ language. The primary objective of this game was to enhance logical thinking and programming skills by implementing a user-interactive environment. The program generated a random number, prompting users to guess the correct value while incorporating robust user input validation mechanisms. This project not only reinforced my understanding of conditional statements within C++ but also required the utilization of random number generation, adding a layer of complexity to the coding process. The incorporation of score tracking features further contributed to a comprehensive understanding of variable management and data persistence. Through the creation and refinement of the Number Guessing Game, I gained practical insights into the interplay between logical algorithms and user engagement within the context of software development, further enriching my skill set during the internship at Codsoft.

```cpp
#include<bits/stdc++.h>

using namespace std;

int main() {
    srand(static_cast<unsigned int>( time(0)));


    int num =  rand() % 100 + 1;
    int guess;
    cout<<"------------NUMBER GUSSING GAME----------------- "<<endl;
    cout << "Guess the number (between 1 and 100): ";

    while (true) {
        cin >> guess;

        if (guess == num) {
            cout << "Congratulations! You guessed the correct number!\n";
            break;
        } else if (guess < num) {
            cout << "Too low. Try again: ";
        } else {
            cout << "Too high. Try again: ";
        }
    }

    return 0;
}
```

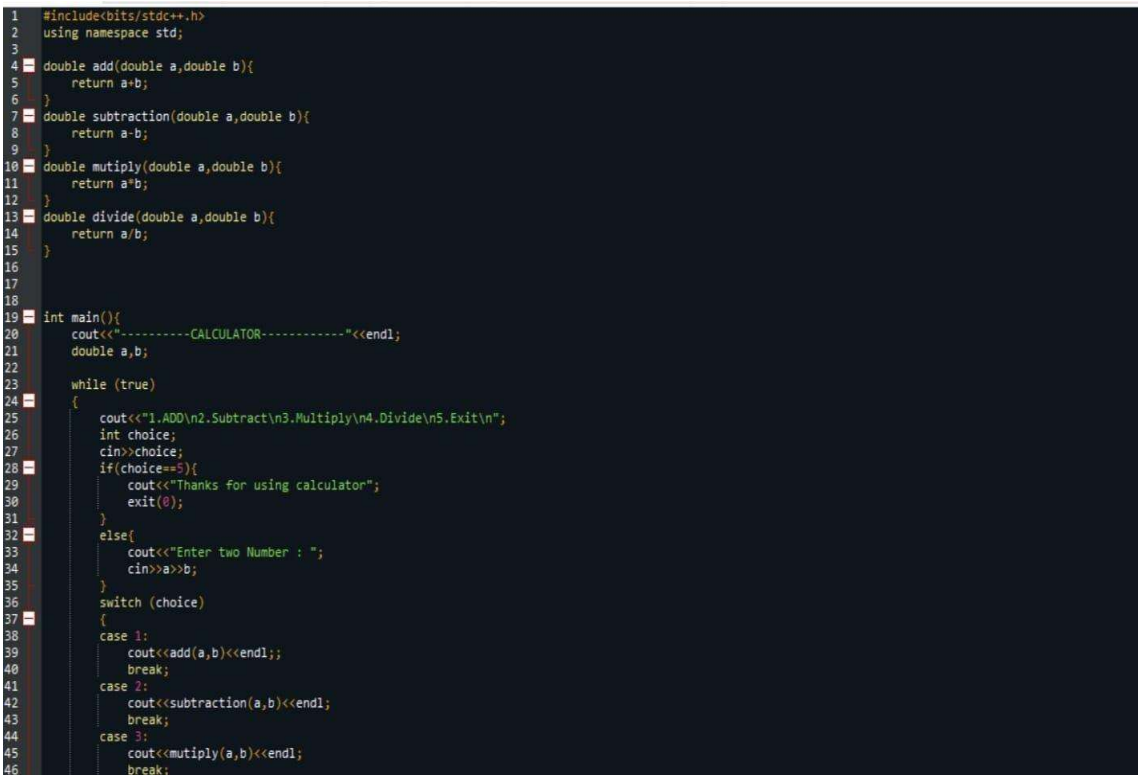
OUTPUT

```
Welcome to the Number Guessing Game!
I'm thinking of a number between 1 and 100.
Enter your guess: 54
Too high! Try again.
Enter your guess: 29
Too low! Try again.
Enter your guess: 34
Too low! Try again.
Enter your guess: 39
Too low! Try again.
Enter your guess: 46
Too high! Try again.
Enter your guess: 42
Congratulations! You guessed the number 42 in 6 attempts
```

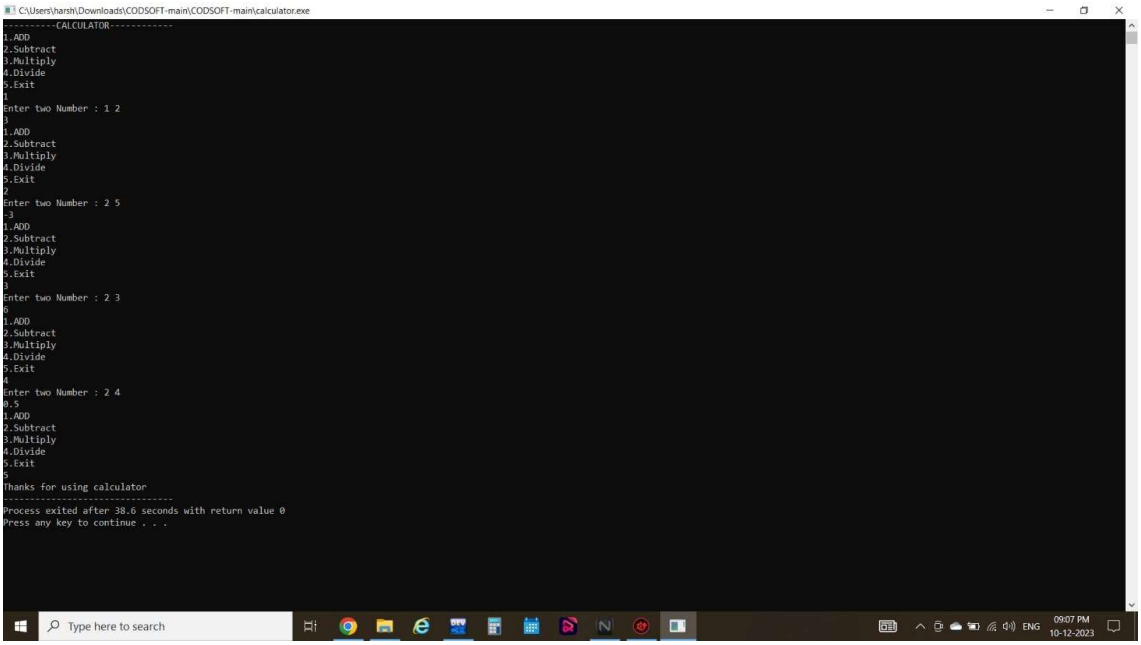
2)Simple Calculator :

The development of the Simple Calculator project during my internship at Codsoft represented a significant exploration into the practical application of C++ programming principles. The primary goal of this endeavour was to implement a basic arithmetic calculator, which necessitated a nuanced understanding of user input handling, error validation, and fundamental mathematical operations. The project required the incorporation of features such as addition, subtraction, multiplication, and division, all while ensuring the program could intelligently handle diverse user inputs. This endeavour provided an opportunity to deepen my comprehension of conditional statements and functions within C++, essential components for effective program execution. The emphasis on error handling mechanisms for invalid inputs further honed my problem-solving skills, contributing to a more robust understanding of code reliability. The Simple Calculator project served as a practical exercise in the implementation of core programming concepts within a real-world context, fostering a heightened proficiency in C++ programming during my tenure at Codsoft.

Source code:



```
#include<bits/stdc++.h>
using namespace std;

double add(double a,double b){
    return a+b;
}
double subtraction(double a,double b){
    return a-b;
}
double mutiply(double a,double b){
    return a*b;
}
double divide(double a,double b){
    return a/b;
}



int main(){
    cout<<"----------CALCULATOR-----------"<<endl;
    double a,b;

    while (true)
    {
        cout<<"1.ADD\n2.Subtract\n3.Multiply\n4.Divide\n5.Exit\n";
        int choice;
        cin>>choice;
        if(choice==5){
            cout<<"Thanks for using calculator";
            exit(0);
        }
        else{
            cout<<"Enter two Number : ";
            cin>>a>>b;
        }
        switch (choice)
        {
        case 1:
            cout<<add(a,b)<<endl;;
            break;
        case 2:
            cout<<subtraction(a,b)<<endl;
            break;
        case 3:
            cout<<mutiply(a,b)<<endl;
            break;
```



3) The Tic-Tac-Toe Game

The development of the Tic-Tac-Toe Game during my internship at Codsoft represented a nuanced exploration of C++ programming principles and interactive game design. The primary objective of this project was to create a two-player gaming experience with inherent win/lose/draw conditions, thereby necessitating a profound understanding of array usage and iterative loops within the C++ language. The implementation of core gaming logic required the development of algorithms to determine the outcome of each move, contributing to a deeper appreciation of logical structures in programming. Moreover, the project involved user input validation and dynamic array manipulation, fostering an understanding of complex data structures. The interactive nature of the Tic-Tac-Toe Game not only served as an engaging application of programming concepts but also enhanced my ability to design and implement user-centric functionalities. This project, therefore, stands as a testament to the practical application of advanced C++ programming skills in the development of interactive and algorithmically driven gaming applications

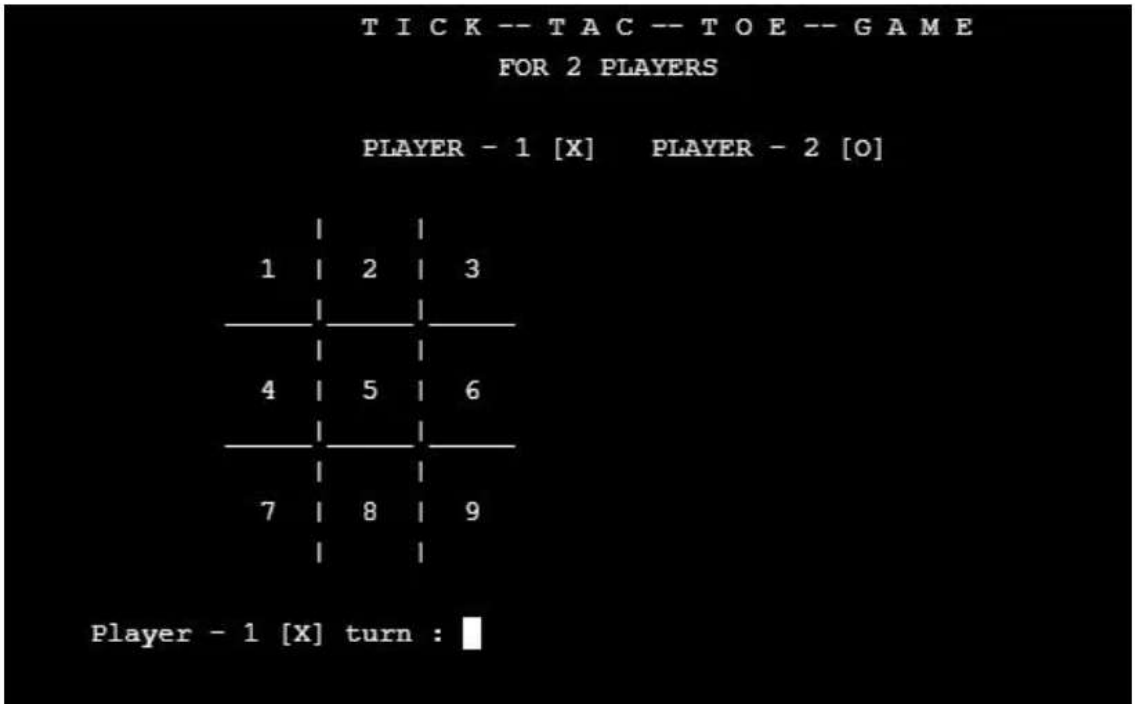
Source code:

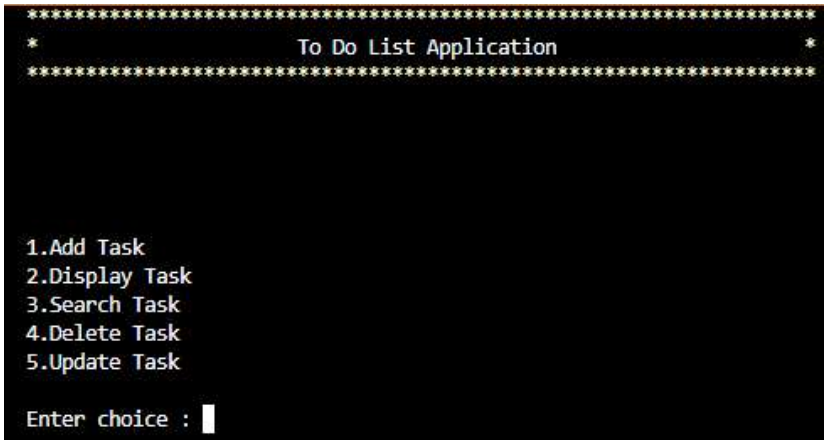
```
#include <iostream>
#include <stdlib.h>
using namespace std;
//Array for the board
char board[3][3] = {{'1','2','3'},{'4','5','6'},{'7','8','9'}};
//Variable Declaration
int choice;
int row,column;
char turn = 'X';
bool draw = false;

void display_board(){
    cout<<"PLAYER - 1 [X]t PLAYER - 2 [O]nn";
    cout<<"  (const char [5])"tt  "
    cout<<"tt  "<<board[0][0]<<"  | "<<board[0][1]<<"  |  "<<board[0][2]<<" n";
    cout<<"tt_____|_____|_____n";
    cout<<"tt     |     |     n";
    cout<<"tt  "<<board[1][0]<<"  | "<<board[1][1]<<"  |  "<<board[1][2]<<" n";
    cout<<"tt_____|_____|_____n";
    cout<<"tt     |     |     n";
    cout<<"tt  "<<board[2][0]<<"  | "<<board[2][1]<<"  |  "<<board[2][2]<<" n";
    cout<<"tt     |     |     n";
}

//Function to get the player input and update the board

void player_turn(){
    if(turn == 'X'){
        cout<<"ntPlayer - 1 [X] turn : ";
    }
    else if(turn == '0'){
```

```
    switch(choice){
        case 1: row=0; column=0; break;
        case 2: row=0; column=1; break;
        case 3: row=0; column=2; break;
        case 4: row=1; column=0; break;
        case 5: row=1; column=1; break;
        case 6: row=1; column=2; break;
        case 7: row=2; column=0; break;
        case 8: row=2; column=1; break;
        case 9: row=2; column=2; break;
        default:
            cout<<"Invalid Move";
    }

    if(turn == 'X' && board[row][column] != 'X' && board[row][column] != 'O'){
        board[row][column] = 'X';
        turn = 'O';
    }else if(turn == 'O' && board[row][column] != 'X' && board[row][column] != 'O'){

        board[row][column] = 'O';
        turn = 'X';
    }else {
        cout<<"Box already filled!n Please choose another!!nn";
        player_turn();
    }
    display_board();
}

bool gameover(){
    //checking the win for Simple Rows and Simple Column
    for(int i=0; i<3; i++)
```

```
bool gameover(){
    //checking the win for Simple Rows and Simple Column
    for(int i=0; i<3; i++)
    if(board[i][0] == board[i][1] && board[i][0] == board[i][2] || board[0][i] == board[1][i] && board[0][i] == board[2][i])
    return false;

    //checking the win for both diagonal

    if(board[0][0] == board[1][1] && board[0][0] == board[2][2] || board[0][2] == board[1][1] && board[0][2] == board[2][0])
    return false;
    for(int i=0; i<3; i++)
    for(int j=0; j<3; j++)
    if(board[i][j] != 'X' && board[i][j] != 'O')
    return true;
    draw = true;
    return false;
}

int main()
{
    cout<<"tttT I C K -- T A C -- T O E -- G A M Ettt";
    cout<<"nttttFOR 2 PLAYERSnttt";
    while(gameover()){
        display_board();
        player_turn();
        gameover();
    }
    if(turn == 'X' && draw == false){
        cout<<"nnCongratulations!Player with 'X' has won the game";
    }
    else if(turn == 'O' && draw == false){
        cout<<"nnCongratulations!Player with 'O' has won the game";
    }
    else
    cout<<"nnGAME DRAW!!!nn";
}
```

Output:

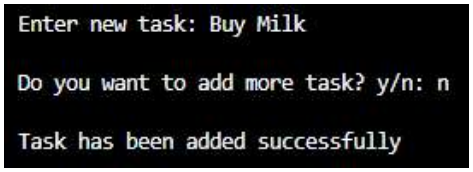




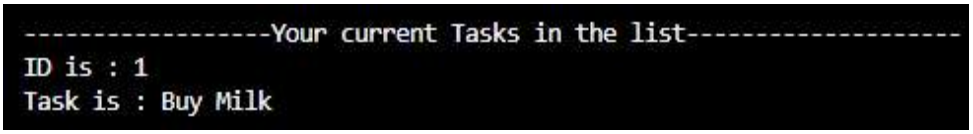
4) TO-DO LIST

The To-Do List project undertaken during my internship at Codsoft represented an insightful exploration into the practical implementation of data structures and file handling within the context of C++ programming. The principal aim of this project was to develop a task management system, necessitating the design and implementation of functionalities such as adding, updating, and deleting tasks. To achieve this, the incorporation of data structures facilitated the organization and manipulation of task-related information, contributing to a deeper understanding of complex data structures inprogramming. Furthermore, the project involved the implementation of priority sorting mechanisms, thereby emphasizing the importance of efficient algorithms for real-world applications. The integration of file handling features enabled the persistence of task data enriching my knowledge of data storage and retrieval in C++. This project served as a valuableexercise in the practical application of advanced programming concepts, offering insights intothe multifaceted aspects of data management and organization within software development.

Adding Task:



Display Task:



CHALLENGES FACED AND SOLUTIONS

The internship at Codsoft presented a dynamic learning environment, marked by various challenges encountered during the development of the C++ programming projects. A primarychallenge involved debugging and troubleshooting, requiring a systematic approach to identifyand rectify coding errors. This process not only honed my skills in error detection but also deepened my understanding of the intricacies of the C++ language. Logical errors presented another significant challenge, necessitating a comprehensive analysis of the code's underlyinglogic. Through iterative problem-solving and collaboration with peers, I developed strategies to address these issues effectively, enhancing my critical thinking and logical reasoning abilities. Time management and task prioritization emerged as crucial challenges in handling multiple projects simultaneously. Adopting agile methodologies and employing project management tools facilitated efficient organization, enabling me to meet deadlines and deliver quality outputs. In summary, the challenges faced during the internship at Codsoft were instrumental in fostering a resilient problem-solving mindset and refining technical skills. The experience underscored the iterative and collaborative nature of software development, emphasizing adaptability and continuous improvement in navigating the complexities of C++programming projects.

CONCLUSION

The projects served as practical exercises, reinforcing my understanding of fundamental programming concepts such as conditional statements, loops, data structures, and file handling. The experience deepened my proficiency in C++ syntax and logical problem-solving, fostering a more comprehensive grasp of software development principles. Challenges faced during the internship, including debugging, logical errors, and effective time management, contributed to my growth as a programmer. The iterative nature of problem-solving and collaboration with peers highlighted the dynamic and adaptive aspects of software development. In conclusion, my internship at Codsoft not only provided a platform for hands-on application of C++ programming but also instilled a resilient and problem-solving mindset. The diverse projects undertaken, and the challenges overcome underscore the practical relevance of theoretical knowledge, preparing me for future endeavours in the evolving landscape of software development. The experience at Codsoft has been instrumental in shaping my skills, fosteringadaptability, and instilling a deeper appreciation for the intricacies of C++ programming.

Git Repositories

1) Project-01:
   https://github.com/gopal15092La/codsoft_task_01

2) Project-02:
   https://github.com/gopal15092La/codsoft_task_02

3) Project-03:
   https://github.com/gopal15092La/codsoft_task_04

BIBLOGRAPHY

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https://www.youtube.com/watch?v=FfXoiwwnxFw&list=PLgUwDviBIf0qUlt5H_kiKYaNSqJ81PMMY

https://www.youtube.com/watch?v=M3_pLsDdeuU&list=PLgUwDviBIf0rGEWe64KWas0Nryn7SCRWw

C.ID: 4b37433

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CERTIFICATE

OF COMPLETION
PROUDLY PRESENTED TO

Gopal Krushna Panda

has successfully completed 4 weeks of a virtual internship program in
C++ Programming
with wonderful remarks at **CODSOFT** from **25/07/2023 to 25/08/2023.**

We were truly amazed by his/her showcased skills and invaluable contributions to the tasks and projects throughout the internship.

Founder

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Date: **28/08/2023**