

# Vandra Dulari – 25GRC1151

## Kinetic Energy Equation: Task and Implementation

### Introduction

In this project, Here is a C program that implements the kinematic equations and solves for final velocity, displacement, or time based on the user's input. It includes basic input validation and provides results based on the kinematic equations.

### Implementation

The program allows the user to input values for initial velocity, acceleration, and time, and it can compute the following:

**Final Velocity ( $v_f$ ):** The velocity of the object after a certain time.

**Displacement ( $d$ ):** The distance travelled by the object during that time.

**Time ( $t$ ):** The time required to reach a specific final velocity or displacement.

### Uses in Robotics

Projectile motion is highly applicable in robotics, particularly for:

**Robotics Motion Planning:** Robots that need to move along a certain trajectory rely on these equations to calculate the optimal velocity, acceleration, and time.

**Automated Systems:** Kinematic equations are used in industrial robots to calculate displacement when moving objects from one location to another.

### Core Language and Tools

My core programming language is Python, which I used for this task due to its simplicity and robust libraries like `math`. Although I primarily use Python, I also researched and took assistance from AI to understand and perform the task efficiently.

### Problems faced during development

**Syntax and Logic Errors:** Since I primarily use Python, adapting to C's syntax posed a challenge. However, through consistent practice and external resources, I was able to resolve the issues.

**Input Validation:** Ensuring that the program handled invalid inputs (like zero acceleration) required additional logic.

## IR SENSOR ON GPB

Due to lack of experience in electronics and hardware, my IR sensor circuit encountered some error which I wasn't able to solve and due to which I wasn't able to perform my hardware task.

I am supposed to study about electronics and hardwares myself in my future journey for better knowledge.