**Patel Maharshi – 25GRC1118**

**Work Energy Theorem Calculator : Task and Implementation**

Introduction

In this project, I developed a program to calculate key aspects of the Work-Energy Theorem, such as the work done on an object, its initial and final kinetic energy, and the relationship between these values. This calculator can be applied in physics education and engineering, particularly in robotics, to model energy transformations during motion.

* Implementation

The Work-Energy Theorem Calculator is based on the fundamental physics principle that the net work done on an object is equal to its change in kinetic energy. Initially, research on the Work-Energy Theorem was conducted, including the necessary equations and their applications.

The program takes the following inputs from the user:

* Mass of the object
* Initial velocity
* Final velocity
* Force applied
* Distance over which the force is applied

The program then computes:

* Work Done: The force applied multiplied by the distance.
* Initial and Final Kinetic Energy: Calculated using KE=1/2.mv^ 2 .
* Validation of the Work-Energy Theorem: Comparing the work done and the change in kinetic energy to confirm their equivalence.

**Core Language and Tools**

My core programming language is Python, but for this project, I implemented the program in C to deepen my understanding of the language. The choice of C was driven by its performance advantages, particularly in embedded systems and robotics applications, where real-time calculations are critical. I used AI assistance to overcome challenges in implementing the code, especially in structuring the program and using libraries in C.

**Problems Faced During Development**

As my primary language is Python, I initially faced challenges adapting to C. Understanding memory management, manual linking of libraries, and syntax differences posed difficulties. However, with the help of AI and additional resources, I was able to develop the Work-Energy Theorem Calculator in C. Going forward, I will continue to strengthen my C programming skills to make it my core language alongside Python.

**IR Proximity SENSOR Using 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.