DOCUMENTATION

1.Abstract

The Engineering Physics Lab Calculator is a menu-driven application developed using the C programming language. It is designed to perform common physics laboratory calculations such as velocity, acceleration, force, energy, and power. Manual calculations in physics labs are time-consuming and prone to errors. This project helps students perform calculations quickly, accurately, and efficiently. It also helps beginners understand the practical application of C programming concepts like functions, loops, and conditional statements.

2.Introduction

Physics laboratory experiments involve repeated mathematical calculations using standard formulas. Performing these calculations manually may lead to mistakes and consumes valuable time.

The Engineering Physics Lab Calculator is developed to overcome these problems by automating calculations using C language.

This program is user-friendly, menu-driven, and easy to operate. It helps students improve their understanding of physics formulas and programming logic simultaneously. The project demonstrates how theoretical physics knowledge can be applied using programming.

3. Software Requirements

The following software is required to run this project:

Operating System: Windows / Linux

Programming Language: C

Compiler: GCC / Turbo C / Code::Blocks

Editor/IDE: Dev C++, Code::Blocks, or any C editor

4.Hardware Requirements

The minimum hardware requirements are:

Processor: Intel Pentium or higher

RAM: 2 GB or more

Hard Disk: 500 MB free space

Input Devices: Keyboard, Mouse

Output Device: Monitor

5.Code (C Program)

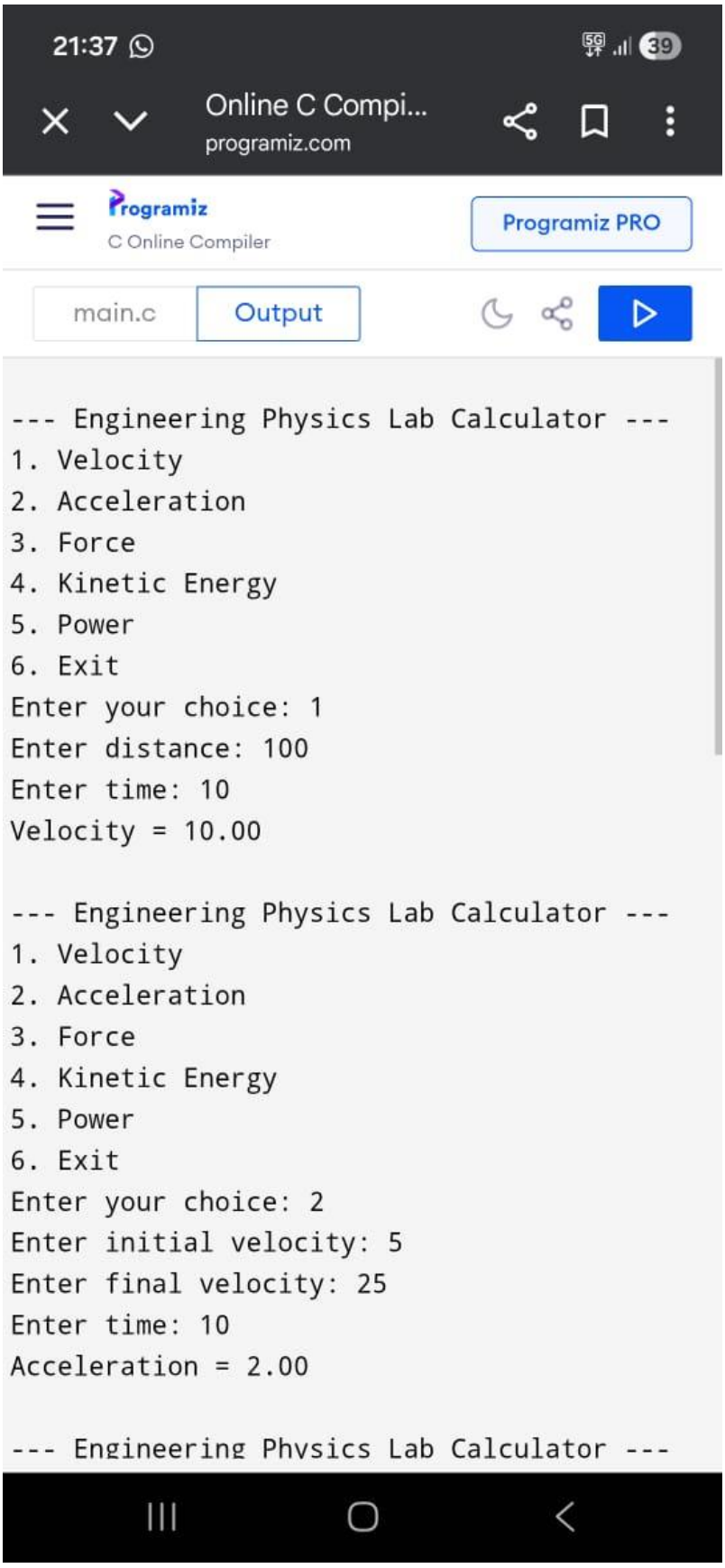
```
#include <stdio.h>
#include <math.h>

Void velocity() {
   Float d, t;
   Printf(“Enter distance: “);
   Scanf(“%f”, &d);
   Printf(“Enter time: “);
   Scanf(“%f”, &t);
   Printf(“Velocity = %.2f\n”, d / t);
}

Void acceleration() {
   Float u, v, t;
   Printf(“Enter initial velocity: “);
        1. Scanf(“%f”, &u);
   Printf(“Enter final velocity: “);
   Scanf(“%f”, &v);
   Printf(“Enter time: “);
   Scanf(“%f”, &t);
   Printf(“Acceleration = %.2f\n”, (v – u) / t);
}
```

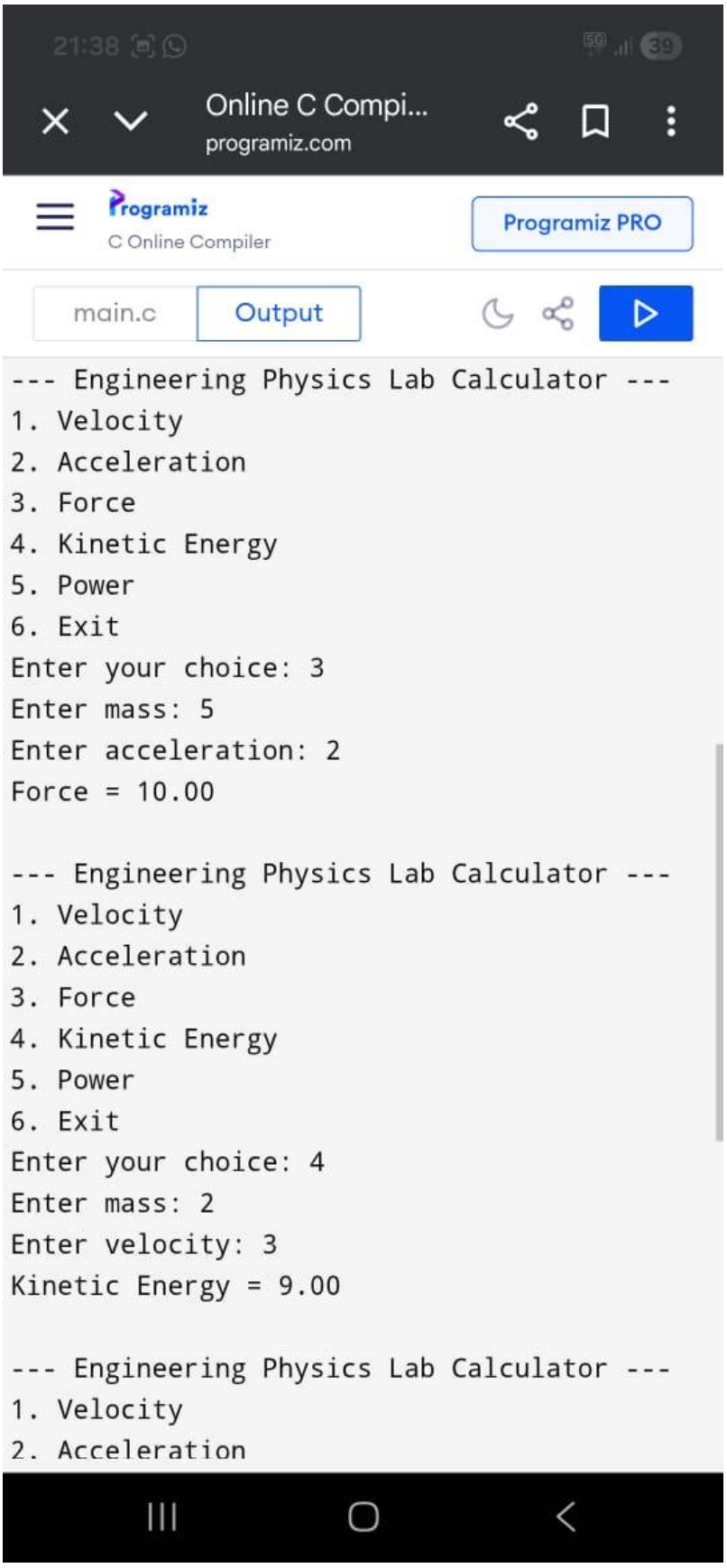
```
Void force() {
   Float m, a;
   Printf(“Enter mass: “);
   Scanf(“%f”, &m);
   Printf(“Enter acceleration: “);
   Scanf(“%f”, &a);
   Printf(“Force = %.2f\n”, m * a);
}

Void energy() {
   Float m, v;
   Printf(“Enter mass: “);
   Scanf(“%f”, &m);
   Printf(“Enter velocity: “);
   Scanf(“%f”, &v);
   Printf(“Kinetic Energy = %.2f\n”, 0.5 * m * v * v);
}

Void power() {
   Float w, t;
   Printf(“Enter work done: “);
   Scanf(“%f”, &w);
   Printf(“Enter time: “);
   Scanf(“%f”, &t);
   Printf(“Power = %.2f\n”, w / t);
}
```

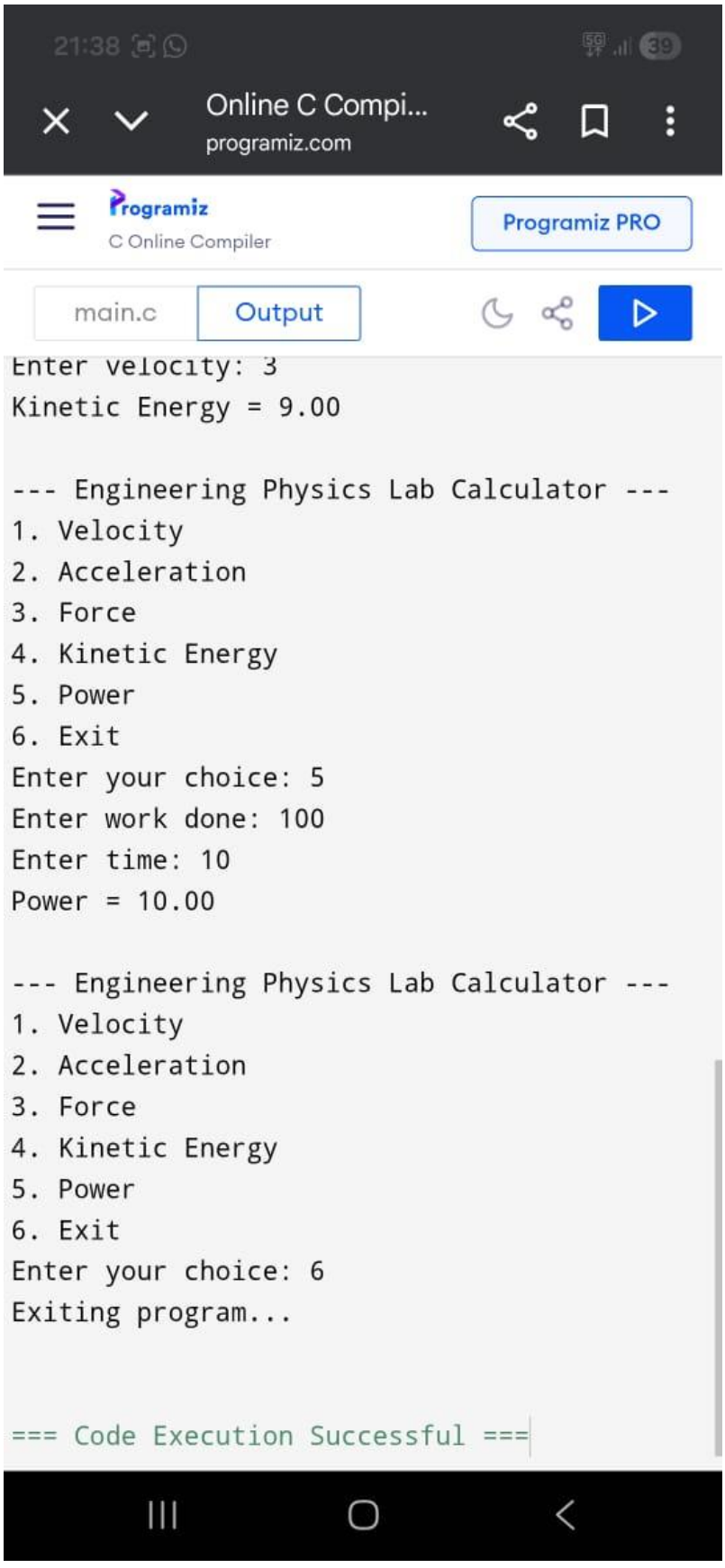
```
Int main() {
   Int choice;
   Do {
      Printf(“\n--- Engineering Physics Lab Calculator ---\n”);
      Printf(“1. Velocity\n”);
      Printf(“2. Acceleration\n”);
      Printf(“3. Force\n”);
      Printf(“4. Kinetic Energy\n”);
      Printf(“5. Power\n”);
      Printf(“6. Exit\n”);
      Printf(“Enter your choice: “);
      Scanf(“%d”, &choice);

      Switch (choice) {
         Case 1: velocity(); break;
         Case 2: acceleration(); break;
         Case 3: force(); break;
         Case 4: energy(); break;
         Case 5: power(); break;
         Case 6: printf(“Exiting program...\n”); break;
         Default: printf(“Invalid choice!\n”);
      }
   } while (choice != 6);

   Return 0;
```

}

6.Result


21:37
39
Online C Compi...
programiz.com
Programiz
C Online Compiler
Programiz PRO
main.c
Output
--- Engineering Physics Lab Calculator ---
1. Velocity
2. Acceleration
3. Force
4. Kinetic Energy
5. Power
6. Exit
Enter your choice: 1
Enter distance: 100
Enter time: 10
Velocity = 10.00
--- Engineering Physics Lab Calculator ---
1. Velocity
2. Acceleration
3. Force
4. Kinetic Energy
5. Power
6. Exit
Enter your choice: 2
Enter initial velocity: 5
Enter final velocity: 25
Enter time: 10
Acceleration = 2.00
--- Engineering Physics Lab Calculator ---


21:38
Online C Compi...
programiz.com
Programiz
C Online Compiler
Programiz PRO
main.c
Output
--- Engineering Physics Lab Calculator ---
1. Velocity
2. Acceleration
3. Force
4. Kinetic Energy
5. Power
6. Exit
Enter your choice: 3
Enter mass: 5
Enter acceleration: 2
Force = 10.00
--- Engineering Physics Lab Calculator ---
1. Velocity
2. Acceleration
3. Force
4. Kinetic Energy
5. Power
6. Exit
Enter your choice: 4
Enter mass: 2
Enter velocity: 3
Kinetic Energy = 9.00
--- Engineering Physics Lab Calculator ---
1. Velocity
2. Acceleration


21:38
Online C Compi...
programiz.com
Programiz
C Online Compiler
Programiz PRO
main.c
Output
Enter velocity: 3
Kinetic Energy = 9.00
--- Engineering Physics Lab Calculator ---
1. Velocity
2. Acceleration
3. Force
4. Kinetic Energy
5. Power
6. Exit
Enter your choice: 5
Enter work done: 100
Enter time: 10
Power = 10.00
--- Engineering Physics Lab Calculator ---
1. Velocity
2. Acceleration
3. Force
4. Kinetic Energy
5. Power
6. Exit
Enter your choice: 6
Exiting program...
=== Code Execution Successful ===

7.Conclusion

The Engineering Physics Lab Calculator is a simple and effective project that automates physics calculations using C programming. It reduces human errors, saves time, and improves accuracy in laboratory work. This project helps students strengthen their understanding of physics formulas and C programming concepts like functions, loops, and switch-case statements. It is a useful learning tool for beginners and can be further enhanced by adding more physics formulas.