

Akdeniz University 2023 Fall Physics for Computer Science I

Final Exam Homework Part

- Write the codes in python or in java or in MS excel or in any other preferred language.
- Feel free to utilize ChatGPT (or a similar AI guidance tool) for coding assistance. If you choose to use it, kindly make it explicit in your response. No points will be deducted for using AI guidance tools.
- Your homework should include plots, programs scripts and images of your calculations (if any). You can upload a program script document and a pdf/word file that includes the plots and any calculations you write. If you wish you can make everything into a single pdf file.

1) **Mandatory:** Have you employed ChatGPT (or a similar AI guidance tool)? If yes, please copy and paste the conversation with it and provide commentary on any modifications you made (if applicable) to arrive at your answers.

2) Write a code (python or java or MS excel or any other language) to calculate various properties of a trajectory motion. The guidance for the initial values are given as follows:

*The initial velocity is calculated as twice the value formed by the 3rd and 4th digits in your student ID number. For instance, if your ID is 20230808602, the initial velocity would be $23 * 2 = 46$ m/s. Similarly, for an ID like 20210808033, the velocity would be $21 * 2 = 42$ m/s.*

The initial angle with the horizontal axis is determined by the last two digits of your student number. If the last two digits are less than 20, add 20 to the number. For instance, if your student number is 20230808602, the initial angle will be $20 + 02 = 22$ degrees. Similarly, for an ID like 20210808033, the angle will be 33 degrees.

Take $g=9.8$ m/s² for this question.

- a) Plot the trajectory of the projectile motion. X vs Y
 - b) Calculate and print out the time of flight, the maximum height and the range of the of the projectile motion with your code.
- 3) Use programming to demonstrate to solve another problem from Physics I topics. Any subject is fine (linear motion, rotational motion, work and energy, torque, moment of inertia, conservation of linear momentum, conservation of angular momentum etc.)