Steps to use the simulator

Table of Contents

The simulator window....2

Inputs....2
1 Length....2
2 Gravity....2

Controls....2
1 Simulation Speed....2
2 Run....2
3 Stop....3
4 Pause....3
5 Resume....3

Results....3
Simulator....3
Grapher....3

Procedure to simulate....3

Enter the input values....3
Select the simulation speed....3
Click on run button to run the simulation....3
Control the simulation....4

The simulator window

The simulator window consists of 5 sub windows:

- Inputs
- Controls
- Results
- Simulator
- Grapher

Inputs

This window consists of the input parameters needed for the simulation namely length and gravity.

1 Length

The length input takes in any positive decimal value, length parameter is considered to be entered in millimetre.

2 Gravity

The gravity is entered in the units m/s^2, The gravities of planets commonly used in calculations are given in the select menu (**Moon, Earth, Jupiter**). If the preset value is not desired a fourth select option **custom** is to be selected which enables the user to use the gravity input area. The input area takes in any positive decimal value.

NOTE: The simulation must be stopped (not paused) to enter new values in the input section.

Controls

This window consists of the controls needed to operate the simulation. It consists of simulation speed, run, stop, pause, and resume.

1 Simulation Speed

The simulation speed selector is a slider that is preset to real-time (1x). It can vary from one-fourth to four times real-time simulation (0.25x to 4x). This slider is disabled when the simulation is running: the simulation has to be stopped (not paused) in order to change the simulation speed.

2 Run

The run button starts the simulation, once the run button is clicked the button is hidden and the buttons stop, pause are made visible.

3 Stop

The stop button terminates the simulation, once the stop button is clicked the button is hidden along with pause and resume, the button run is made visible.

4 Pause

The pause button pauses the simulation, once the pause button is clicked the button is hidden, the button resume is made visible.

5 Resume

The resume button resumes the simulation from pause, once the resume button is clicked the button is hidden, the button pause is made visible.

Results

This window consist of all the calculated results of the experiment. It displays 3 results: Time period in seconds, Frequency in hertz and Angular Frequency in radian/second.

Simulator

This window consist of the pendulum's simulation in real time (at simulation speed 1x).

The pendulum swings with a maximum angle of $\pi/6$ from its equilibrium position.

Grapher

This window consists of the graph between time in seconds and amplitude. The maximum amplitude is considered to be one. The graph is plotted in real time (at simulation speed 1x).

Hovering on the plotted graph would give the amplitude for the corresponding time.

Procedure to simulate

Enter the input values

Enter the length in millimetre and select the gravity from the quick select or enter a custom value for gravity by selecting custom from the select menu.

Select the simulation speed

Use the slider to set the simulation speed. The simulation speed can only be changed when the simulation is stopped (not paused).

Click on run button to run the simulation

Click the run button to start the simulator and the grapher.

Control the simulation

The simulation can be paused, resumed and stopped with the help of the corresponding buttons. Stopping the simulation clears the grapher and simulator but not the results for convenience.