

Homework #2
Scientific Computing (501125-2)
2022-2023 3rd Trimester

Due: Wednesday May 3, 2023, 11:59 pm via Blackboard

- 1) What is the benefit of the command `close all`?
- 2) Can we plot vector $X = [3 \ 9 \ 27]$ over time $t = [1 \ 2 \ 3 \ 4]$? Why or why not?
- 3) Write the Matlab commands that plot the vector $X = [11 \ 43 \ 127]$ over time $t = [1 \ 2 \ 3]$. Make sure that the vector t is on the x axis and the vector X is on the y axis.
 - ☐ Add a title to the figure that says "This is a plot of distance over time"
 - ☐ Add a title to the x axis that says "This is time(s)"
 - ☐ Add a title to the y axis that says "This is distance(m)"
- 4) When do we use a legend in Matlab?
- 5) Given the dependent vectors X , Y , and Z over the independent vector, if you know that $X = [3 \ 9 \ 27]$, $Y = [10 \ 8 \ 6]$, $Z = [4 \ 4 \ 4]$, and $t = [1 \ 2 \ 3]$, use legend to plot these multiple dependent vectors on the same plot.
 - ☐ Use green for X
 - ☐ Use blue for Y
 - ☐ Use red for Z
 - ☐ Add a title to the figure that says "This is a plot of distance over time"
 - ☐ Add a title to the x axis that says "This is time(s)"
 - ☐ Add a title to the y axis that says "This is distance(m)"
 - ☐ Print the legend box
 - ☐ Move the legend box to the south east
- 6) What command can we use to display multiple plots on the same figure?
- 7) Given that $x = 0:0.1:2\pi$ do the following using the subplot function
 - ☐ Define a 2 by 3 subplot figure
 - ☐ In the first box, plot sine x
 - ☐ In the second box, plot cosine x
 - ☐ In the third box, plot negative exponential function of x
 - ☐ In the fourth box, plot x^3
 - ☐ In the fifth box, plot $2x$
 - ☐ In the sixth box, plot x^2

- 8) Create a vector named time of numbers over the range from 0 to 5 with increment 0.5 every time (Hint, use the colon operator), and then do the following:
- Create another vector named height and set it up equal to $2.13 * \text{time}^2 - 0.13 * \text{time}^4 + 0.000034 * \text{time}^{4.752}$
 - Write a Matlab commands that plot the vector height over time. (Hint, make sure that the vector time is on the x axis and the vector height is on the y axis).
 - Rewrite the previous command such that the printed line is changed to be a dashed line.
 - Rewrite the previous command such that the printed line is changed to be a solid line and stars to mark data points.
 - Rewrite the previous command such that the printed line is changed to be a **red dashdot** line and **circles** to mark data points.
 - Add a title to the figure
 - Add a title to the x axis
 - Add a title to the y axis