By submitting this assignment, I agree to the following:
"Aggies do not lie, cheat, or steal, or tolerate those who do."
"I have not given or received any unauthorized aid on this assignment."

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Section: 213
Team: YOUR TEAM NUMBER
Assignment: Lab 2a Act 2
Date: 9/10/21

Preliminary Questions:

1. Can linear interpolation be used for the ISS problem? Justify your answer.
- Because the satellite is moving at a constant speed, we can determine the position of the satellite in respect to the reference point.

2. Does the shape of the orbit Matter?
- Yes, the course must be constant in order to use linear interpolation.

Does the size (length) of the orbit matter?
- No, we're focused on speed and position.

3.In terms of the Linear Interpolation material, what are the dependent and independent quantities for the ISS Problem?
- The dependent quantity is position and the independent quantity is time.

Develop an algorithm to solve the ISS problem:

1.What are the inputs? What are the units of these inputs?
- The inputs are time and the units are minutes.

2.What is the expected result? What are the units of that result?
- The expected result is distance in kilometers.

3. What are the steps required to transform the inputs into the desired result?
- To start, you must set the slope equations for both the satellite to satellite and one satellite to the sought-after points equal to one another. Then you use algebra to move the equation around and isolate the distance variable of the sought after point.

Test your algorithm:

1. A) When T=15, displacement = 4358.33 km

B) When t= 30, displacement = 11358.33 km

C) When t= 42, displacement = 16958.33 km

D) When t= 55, displacement = 23,025 km

2. I believe my results are correct because they progress logically between the given intervals and f(55) equals 23,025 like the problem says. My classmates had the same results.

Activity #3

Questions to think about for Part 1:

1. My distance is negative if I enter 0 as the time input.
2. The distance given is -2641.67 km.
3. The negative number indicates that the satellite is behind my first reference satellite position and outside of my interpolation zone.
4. No, t=0 does not mean that the satellite is in Houston, but that we are just starting to measure its time in orbit.

Questions to think about for part 2:

1. Yes, this is linear extrapolation.
2. Extrapolation can sometimes be used to make estimates on the position of an object outside of the linear function.
3. Linear extrapolation is acceptable when the line you are extending is approximately linear.

Another Question to think about for Part 2:

1. The code for part 2 will output the same value as the code for part 1, given that you convert the 25 minutes to hours before plugging the value into the part 2 program.