Problem Set 11 – Complex Loops

Instructions

1. This problem set contains paired programming and individual programming problems. Each problem has a set of deliverables that needs to be submitted. You are responsible for following the appropriate guidelines and instructions below. Create appropriately-named files as instructed.
2. Save all files to your Purdue career account in a folder specific to PS11.
3. Compress all deliverables into one zip file named PS11_yourlogin.zip. Submit the zip file to the Blackboard drop box for PS11 before the due date.

Deliverables List

Item	Type	Deliverable
Problem 1: Infusion Plot	Individual	PS11_infusion_yourlogin.m PS11_infusion_exec_yourlogin.m PS11_infusion_exec_yourlogin_report.pdf
Problem 2: Approximation of √2	Individual	PS11_sqrt2_nloop_yourlogin.m PS11_sqrt2_noloop_yourlogin_report.pdf

Problem 1: Medication Infusion Plot

Paired Programming

Problem Setup

In PS10 Problem 3, you created a user-defined function that calculated the time needed to administer a full infusion of medication. Review that problem and your code for it. Note that the solution is available on Blackboard.

For this problem, you are building on that code. You need to add functionality that allows you to produce a plot of total administered medication over time of the infusion. You will modify your user-defined function from PS10 Problem 3 and create an executive function to call it.

Your modified user-defined function must

- accept a patient's weight in kilograms and medication dose in mg/kg (as in PS10 Problem 3)
- determine the total time for the infusion (minutes) as a vector
- determine total administered medication (mg) at each minute as a vector, and

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- return the total infusion time and administered dose.

Your executive function will

- initialize the patient's weight and dose,
- call the sub-UDF to get the time and administered medication vectors, and
- plot the vectors.

Problem Steps

1. Revise your PS10_infusion_login.m file so that it has the functionality listed in the Problem Setup. Name this new function **PS11_infusion_*yourlogin*.m**.
2. Create the executive function so that it has the functionality listed in the Problem Setup. Name this function **PS11_infusion_exec_*yourlogin*.m**.
3. Set the patient's weight to 75 kg and dose to 85 mg.
4. Publish your executive function as a PDF file named **PS11_infusion_exec_*yourlogin*_report.pdf**

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Problem 2: Approximation of $\sqrt{2}$

Individual Programming

Problem Setup

In PS10 Problem 2, In PS10 Problem 2, you had to follow a flowchart that outlined a method for approximating the $\sqrt{2}$ using a summation. Review that problem and your code for it. Note that the solution is available on Blackboard.

Your task for this problem is to perform the same summation without using a loop. Your new code will be a UDF that

- Has the same inputs and outputs as defined in PS10 Problem 2
- Continues to check for invalid inputs and print error messages as defined in PS10 Problem 2
- Finds the sum of the terms for the approximate value of $\sqrt{2}$ without using a loop.

Problem Steps

1. Revise your PS10_sqrt_login1_login2.m so it has the same functionality but without a loop. Name this new version **PS11_sqrt2_noloop_*yourlogin*.m**.
2. Test your function by calling it from the Command Window with the following test cases:
   a. n = 10
   b. n = 15
   c. n = 37

   Do not suppress your function call to allow the output arguments display to the Command Window. Paste the function call and results displayed in the Command Window as comments under the `COMMAND WINDOW OUTPUTS` section of your function file.
3. Publish your function as a PDF using any valid test case and name the file **PS11_sqrt2_noloop_*yourlogin*_report.pdf**.