

**Instructions**

1. Create a directory named `last_name_quiz2`
  2. For all problems requiring the use of a script, save your commands in `last_name_quiz2.m`
  3. Your script should provide printouts of required output.
  4. You may not consult **any** external sources or notes of any form. The use external sources or notes constitute a violation of Loyola's honor code and may result in failure of the course.
  5. After you completed your quiz, zip your `last_name_quiz2` directory and email it to me (`pchidyagwai@loyola.`) before you leave the lab. No late submissions will be accepted.
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1. Given `x=randi([-50 50], 50,1);`, give relational expressions and logical operators to:
  - (a) Extract the positive integers
  - (b) Find the number of positive integers
  - (c) Add 2 to the even elements of the vector
  - (d) Extract any prime numbers among the positive entries of the vector.

2. The constant  $e$  can be approximated as

$$e \approx \sum_{k=0}^N \frac{1}{k!}$$

Write a script to determine the smallest value of  $N$  such that the series sum approximates  $e$  with an error less than  $1.0\text{e-}16$ . You can use `e = exp(1)` as the true value of  $e$  from MATLAB.

3. Write a function `pw_f1.m` that defines the following piecewise function

$$y = \begin{cases} e^{x+1} & \text{for } x < -1 \\ 2 + \cos(\pi x) & \text{for } -1 \leq x \leq 5 \\ 10(x - 5) + 1 & \text{for } x > 5 \end{cases}$$

Provide commands to call your function and output values for  $f(-2)$ ,  $f(0)$  and  $f(6)$  in your script file.

4. Write a MATLAB function `pick3.m` that takes as input a random vector of length at least 4 and returns a sub-vector with 3 random elements. Your function should give an error if the input vector has 3 elements or less. Test your function in your script with random vectors of length 1, 5 and 10.