

For this lab, the goal is just to get familiar with some basic operations covered in the class. There are a few short practices. Notes:

- (1) Use **No Loop** in these exercises.
- (2) Use only functions mentioned in the class so far, unless noted otherwise.
- (3) Save your code in script files (*.m) for easy testing/debugging.

Practices:

- 1.** Given a vector v of length 4 representing two fractal numbers, give the text output of its fractional sum:

Example: $v: 3 \ 7 \ 5 \ 2$ Your output: $3/7+5/2=41/14$

Note: Use **fprintf** for this task.

- 2.** Compute $1/1 + 1/2 + 1/3 + \dots + 1/999 + 1/1000$.

- 3.** Compute $1 + a^1/1! + a^2/2! + a^3/3! + \dots + a^{100}/100!$. (Note: **cumprod** is useful here.) Compare the result with **exp(a)** for several values of a .

- 4.** Make $n \times n$ diagonal matrices (n given in a variable) whose diagonal values are 1 to n . (Note: Do not use the **diag** function for this exercise. First determine the linear indices of the diagonal elements, and then assign $1:n$ to them.) Example for $n=5$:

```
1 0 0 0 0
0 2 0 0 0
0 0 3 0 0
0 0 0 4 0
0 0 0 0 5
```

- 5.** For a vector of numbers, output another vector such that:

The odd-indexed elements of the output vector are the numbers in the input;

Each even-indexed element of the output is the mean of its two neighbors.

Example: For input $[1 \ 3 \ 6 \ 2 \ 5]$, the output is $[1 \ 2 \ 3 \ 4.5 \ 6 \ 4.2 \ 3.5 \ 5]$.

- 6.** Implement the functionality of the function **meshgrid** yourself. First check the documentation of **meshgrid** and also call it from the command window to see the generated matrices from given input vectors. Note: Use **repmat** in your implementation.

(You do not need to write a function here; just write your own statements to generate the output matrices from the input vectors. Use only the form of **meshgrid** for 2-D grids, with two input vectors x and y , and two output matrices X and Y .)