ES118 Lab 9

Dec 16, 2024

Exercise 1

Using a loop find all numbers between 10 and 120 which are divisible by 3 but not by 9.

Exercise 2

Create the matrix below using `for` loops.

$$\mathbf{M} = \begin{bmatrix} -1 & +1 & -1 & +1 \\ +1 & -1 & +1 & -1 \\ -1 & +1 & -1 & +1 \end{bmatrix}$$

Exercise 3

Approximate π using

$$\sqrt{6\left(\sum_{n=1}^{\infty} \frac{1}{n^2}\right)}$$

until $|\pi - \pi_{approx}|$ is below $1(10^{-4})$.

Exercise 4

Write a script which prompts the user enter x, y and n, and calculates the following expression using some loops

$$w = \sum_{k=1,3,5,\ldots}^{2n-1} x^{1/k} e^{2k/y}$$

The code should check if

- n is bigger than 5, and smaller than 20
- x is positive, and smaller than 10

- y is positive, and smaller than 20

If one of those conditions is not provided, no calculation is done and a message like *"Re-enter values!"* is displayed.

Exercise 5

Write a script which prints the sum of all given values which are divisible by 3. The input prompt stops when the user enters 0. Use `while` loop.

Example: If the user enters 6, 5, 10, 9, 2, 0 the script will print 15.

Exercise 6

Calculate the following equation using only one loop.

$$S = \sum_{y=1,3,5,\ldots}^{23} \sum_{x=2,4,6,\ldots}^{24} \frac{3x - e^{1/y}}{\sqrt{x+e} + \sin(\pi + x)}$$