Conditional Programming with MATLAB

LAB 5

ENGG100 - Spring 2024

Lab 5 Objectives

- To be able to build upon the concepts learnt in Lab 4 using conditional statements and loops
- To be able to use nested conditional statements and loops

TASK 1 - SCRIPT

Write a script that asks a student for their marks and converts it into a grade:

- Between 85-100: “You have scored High Distinction (HD)”
- Between 75-84: “You have scored Distinction (D)”
- Between 65-74: “You have scored Credit (C)”
- Between 50-64: “You have scored Pass (P)”
- Less than 50: “You have Failed (F)”

In your script, include an else statement that checks for incorrect entries (e.g. a negative number, number higher than 100) and displays an error to the user

TEST VALUES (Include these in your report): **-3, 25, 72, 83, 97, 130**

TASK 2 - SCRIPT

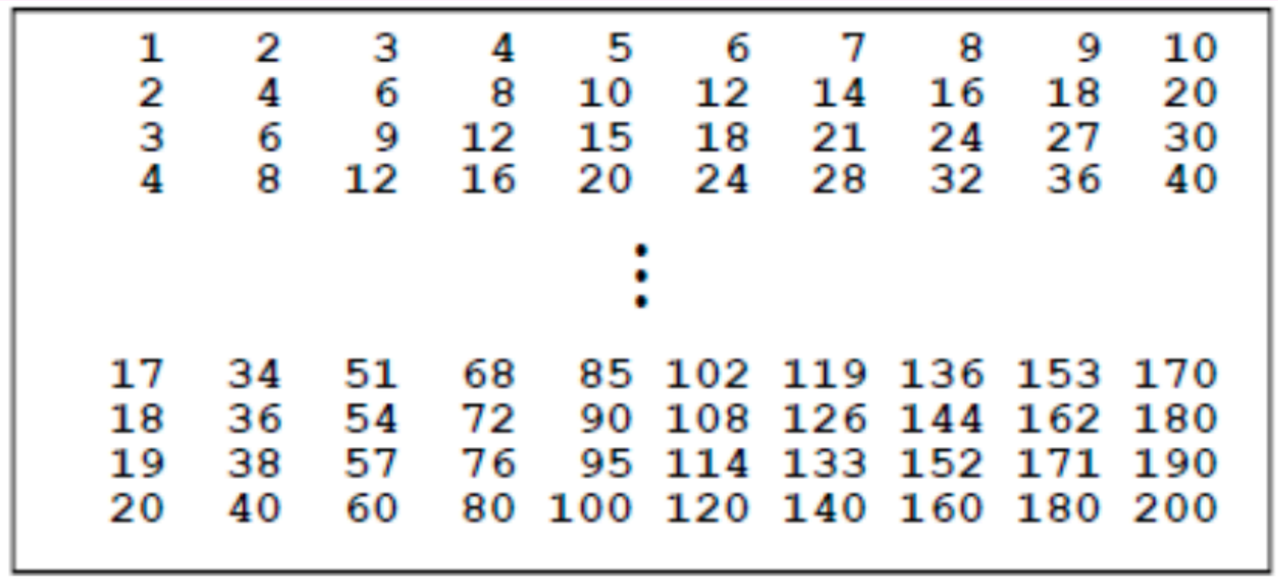
- Create a script with a **for** loop to display the below:

```
cellarray =

    'This is line 1'
    'This is line 2'
    'This is line 3'
    'This is line 4'
    'This is line 5'
    'This is line 6'
    'This is line 7'
    'This is line 8'
    'This is line 9'
    'This is line 10'
```

TASK 3 - SCRIPT

Use two nested for loops to create the following 2D array:



1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
				⋮					
17	34	51	68	85	102	119	136	153	170
18	36	54	72	90	108	126	144	162	180
19	38	57	76	95	114	133	152	171	190
20	40	60	80	100	120	140	160	180	200

TASK 4 (BONUS) - SCRIPT

A greyscale digital image can be defined as a two dimensional matrix containing 0's (representing black) and 1's (representing white)

1. Create a 100x100 identity matrix and use `imshow` to plot a greyscale representation of the identity matrix (take a screenshot for your report)
2. Next, use `for` loops and `if` statements to add to the identity matrix the following white lines:
   - Add a horizontal line at rows 50 & 51
   - Add a vertical line at columns 50 & 51
   - Add a diagonal line from top right to bottom left