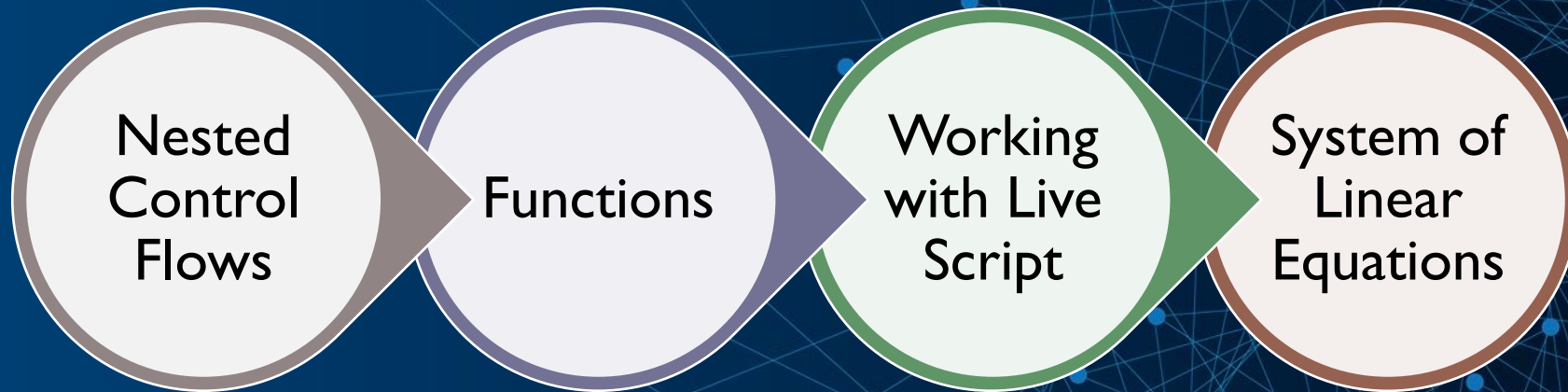


ELEMENTARY MATLAB® COURSE – SESSION 3

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- Sharif University of Technology
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CONTENTS



NESTED CONTROL FLOW

EXAMPLE

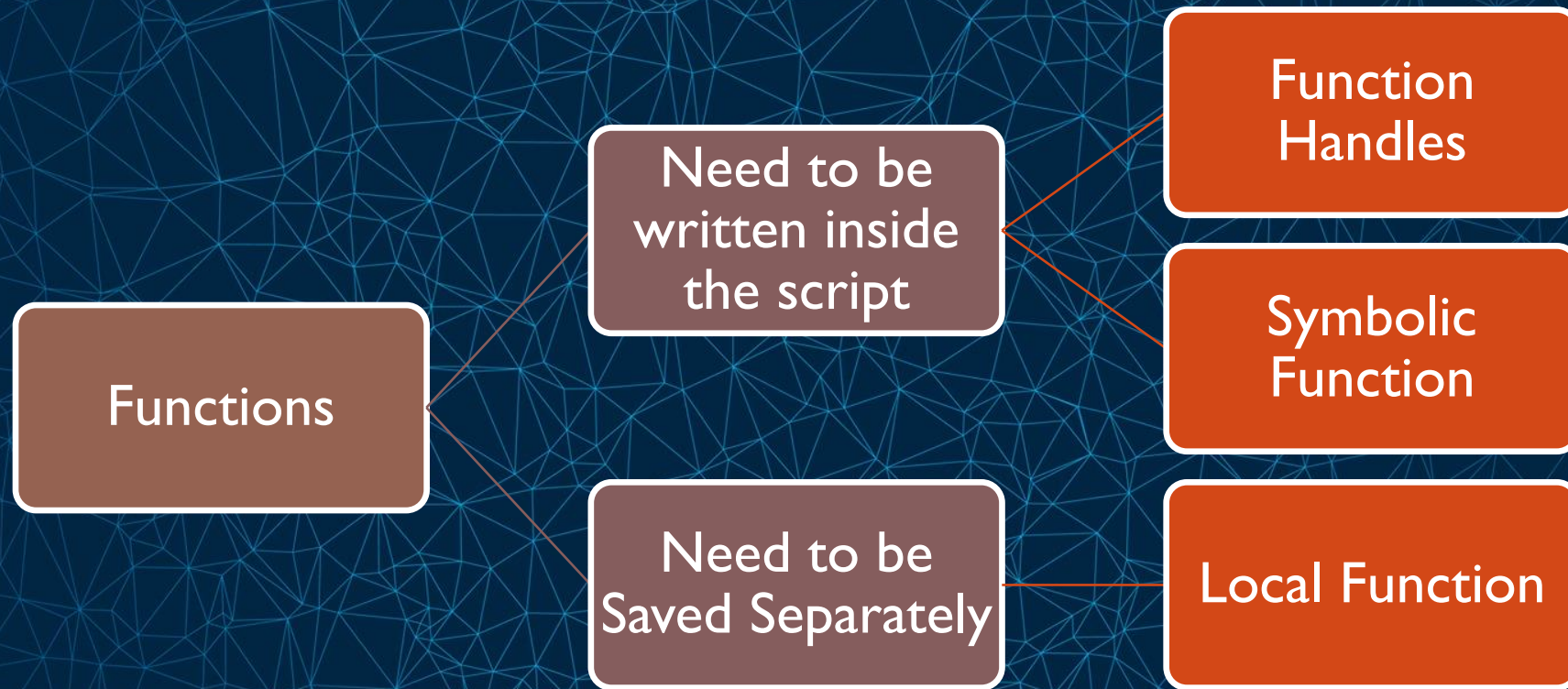
- Write a script that simulates a simple game of guessing a number. The program should randomly generate a number between 1 and 100, and then prompt the user to guess the number. The program should tell the user if their guess is too high, too low, or correct. The game continues until the user guesses the correct number. The program should also keep track of the number of attempts the user makes.



FUNCTIONS

An abstract network diagram consisting of numerous blue dots (nodes) connected by thin, light blue lines (edges). The nodes are distributed across the right half of the image, with a higher density of connections and nodes on the right side, creating a complex web-like structure.

TYPE OF FUNCTIONS



LOCAL FUNCTION

```
function [output] = function_name(input variables)  
statement  
end
```



FUNCTION HANDLES

Function_name = @(variables) statement

Function_name(variable)
= output



EXAMPLE : ANTOINE EQUATION

Chemical Engineers uses Antoine equation to calculate saturated pressure using given temperature and vice versa. Antoine equation is written as follows:

$$\log(P) = A - \frac{B}{T + C} \quad (\text{Pressure form})$$

$$T = \frac{B}{A - \log(P)} - C \quad (\text{Temperature form})$$

- Write a function that gets saturated pressure or temperature from user and returns saturated pressure or temperature. Then, Calculate the saturate pressure and temperature for a certain substance in 80 °C and 500 mmHg.

A	B	C
8.043	1582.27	239.726



EXAMPLE: DISTANCE CALCULATOR

For two Cartesian coordinates (x_1, y_1) and (x_2, y_2) , the formula to determine the distance is $d = \sqrt{(x_1 - x_2)^2 + (y_2 - y_1)^2}$. Write a user-defined function “distance” to take two coordinates as input and return the distance as the output.

Check the function for these coordinates:

- $(2, -1)$ and $(-2, -2)$
- $(3, 5)$ and $(-1, -6)$



WORKING WITH LIVE SCRIPT

LIVE SCRIPT FEATURES

1. Seamlessly combine code, text, and visualizations in a single interactive document.
2. Effortlessly document code while crafting engaging narratives.
3. Enjoy real-time updates for smooth workflow.
4. Collaborate efficiently by sharing Live Scripts with team members.
5. Ideal for presentations, tutorials, and workshops, enhancing learning.
6. Customize Live Scripts for flexibility and control.



SYSTEM OF LINEAR EQUATIONS

EXAMPLE

The following figure shows a flat square plate with its side held at constant temperature. Find the temperature at each node x_1, x_2, x_3, x_4 . Each dot represent a node, and the temperature at each node is assumed to be given by the average temperature of adjacent nodes.

$$x_1 = \frac{1}{4}(30 + 15 + x_2 + x_3)$$

$$x_2 = \frac{1}{4}(x_1 + 15 + 20 + x_4)$$

$$x_3 = \frac{1}{4}(30 + x_1 + x_4 + 25)$$

$$x_4 = \frac{1}{4}(x_3 + x_2 + 20 + 25)$$

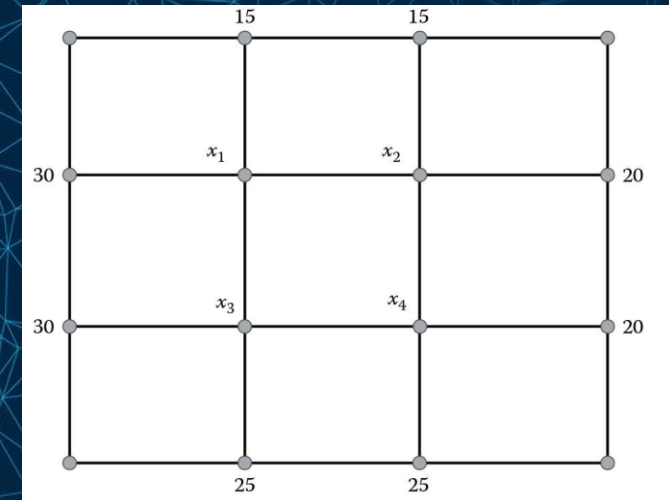


$$4x_1 - x_2 - x_3 = 45$$

$$-x_1 + 4x_2 - x_4 = 35$$

$$-x_1 + 4x_3 - x_4 = 55$$

$$-x_2 - x_3 + 4x_4 = 45$$



END OF PRESENTATION!

Thanks for your attention. 😊