University of Salahaddin
College of Administration and Economics
Department of Statistics

Subject:MATLAB

B.Sc., in Statistics
First Class -Academic Year
Second Course (2022 – 2023)

Dr.Taha Hussein Ali & L: Esraa A. Haydier

Introduction

MATLAB is a proprietary multi-paradigm programming language and numerical computing environment developed by MathWorks. MATLAB allows matrix manipulations, plotting of functions and data, implementation of algorithms, creation of user interfaces, and interfacing with programs written in other languages.

. Millions of engineers and scientists worldwide use MATLAB® to analyze and design the systems and products transforming our world. The matrix-based MATLAB language is the world's most natural way to express computational mathematics. Built-in graphics make it easy to visualize and gain insights from data. The desktop environment invites experimentation, exploration, and discovery. These MATLAB tools and capabilities are all rigorously tested and designed to work together.

MATLAB helps you take your ideas beyond the desktop. You can run your analyses on larger data sets, and scale up to clusters and clouds. MATLAB code can be integrated with other languages, enabling you to deploy algorithms and applications within web, enterprise, and production systems.

Course objective

In this course, we start from the very beginning and no prior programming experience is required. The course will introduce the students to the MATLAB software programming for numerical computations, in particular, familiarizing them with the MATLAB Desktop commands through the Command window, and output through the Graph window. This course is intended as a reference book for students, professionals and research workers who need to apply statistical analysis to a large variety of practical problems using MATLAB. The key objective of this course is to deliver a preliminary coverage of the linear algebras and statistical tools including data description, measure of central tendency, statistical distributions, and correlation and regression

Forms of teaching

Several forms of teaching will be used to reach the objectives of the course: power point presentation for the head titles and summary of conclusion with applications by designing a MATLAB code to generating a sequences independent from random variables has many different distributions. Furthermore, students will content homework. There will be classroom discussions and the lecture will give enough background to, solve, analyse, and evaluate problems sets.

Grading

The student is required to do two closed book exam. at the mid of the semester , all the exam. has 25 marks.

Total of Mid-semester exam. :
50% Final Exam:
50% [25% (Theory) and 25% (Practical)]

Subject : MATLAB		Teacher: Esraa A.Haydier
Content : First course		
Week	**Date**	**Subject**
Lecture-1	**1-2023**	Introduction for MATLAB -Starting MATLAB - Running Function and Entering Variables -Why Matlab is useful?
Lecture-2	**1-2023**	Matlab Windows - Command Window - Workspace - Command History
Lecture-3	**1-2023**	General Comm

		ands in Matlab - Stopping MATLAB in different ways - Changing Font Size -Some delete commands in matlab & Clear -Exist -load
Lecture-4	**1-2023**	Arithmetic operations - Derivative - Integral
Lecture-5	**2-2023**	Create a new File-M
Lecture-6	**2-2023**	Matrices & Operations Matrix

		in MATLAB - Operations on vectors
Lecture-7	**2-2023**	Special Function for matrix or vector
Lecture-8	**2-2023**	Logical Subscripts
Lecture-9	**3-2023**	Relational Operator
Lecture-10	**3-2023**	Conditional Controls - if, else Statements
Lecture-11	**3-2023**	Condition Statements (Switch Statements)
Lecture-12	**4-2023**	- Loop Controls (For & While)
Lecture-13	**4-2023**	Nested Loops
Lecture-14	**4-2023**	Use Function

Lecture-15	**4-2023**	Solving Linear Equations System by Using MATLAB

Examination

Final Exam-First Trail

Q₁/*If you have the following matrix* :   (**10 Marks**)

$$A = (1 \ \ 2\ 5 \ \ 4\ 5\ 88\ 7\ 4\ 8\ 11\ 14 \ \ 5\ 0 \ \ 9\ 10\ )$$

1) **write a command to show number (Rows & Column) for matrix A?**

2) **Replace only First column to (10,11,12,13).**

3) **Add this Row (22,33,44,55) for above matrix.**

4) **Delete only Second column.**

5) **display logical Subscripts for the matrix (greater than 6 & less than 10)**

Q₂ // Answer the following:
(4 Marks)
1)**How is the following matrix formed:**

$$B = (3\ 0\ 0\ 3\ 0\ 0\ 0\ 0\ 1\ 1\ 1\ 1\ 1\ 0\ 1\ 0\ )$$

2) **For the following matrices:**   (**6 Marks**)

$$\mathbf{A} = (0\ 1\ 2\ -2\ 7\ 8\ 4\ 5\ 0\ ) \qquad B = (\ 0\ 1\ 2\ 0\ -3\ 8\ 0\ 5\ 0\ )$$

Find:1) $\sim B$

2) ~ (**A & B**)

3) **A|B**

Q₃) Create a script file for labelling of grading system by using (if statement)? (**5Marks**)

H.W \\

1) **Write a MATLAB program to indicate x is positive or negative with respect to the following tips?**

2) Write a MATLAB program to indicate x is even or odd number with respect to the following tips?