	SUBJECT: BSD2513 ARTIFICIAL INTELLIGENCE	**MARKS**: 25(5%)
	TOPIC: Chapter 2: Search Algorithms	
	LAB REPORT 2	

CLO	Description	PLO Mapping	Percentage	Marks
CLO1	Acquire the artificial intelligence concepts and methodologies in data science.	PLO1: Knowledge and Understanding C3: Application	1%	5
CLO2	Demonstrate critical thinking ideas of artificial intelligence knowledge in problem-solving situation.	PLO2: Cognitive Skills and Functional work skills with focus on Numeracy skills CLO3: Application	1%	5
CLO3	Develop an artificial intelligence system prototype using appropriate software.	PLO3: Functional work skills with focus on Practical, and Digital skills P4: Mechanism	3%	15

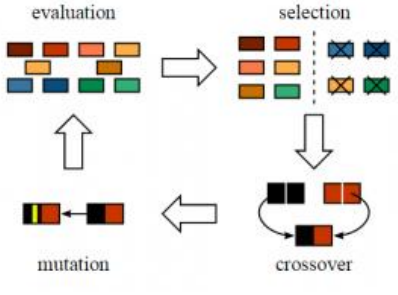
Laboratory Report Objectives

By the end of this lab, students should be able to:

1. articulate AI capability types and their relevance to real deployments;
2. reason about and trace Breadth-First Search (BFS) and Depth-First Search (DFS) on given graphs; and
3. implement a minimal, reliable web app (Streamlit or similar) that runs these traversals, explains their complexity, and is reproducible from a GitHub repository (with a live deployment link).

CASE STUDY:

A genetic algorithm is a search heuristic inspired by Charles Darwin's theory of natural evolution. This algorithm reflects the process of natural selection, where the fittest individuals are selected for reproduction to produce offspring of the next generation.



The offsprings thus produced are again validated using our fitness function, and if considered fit then will replace the less fit chromosomes from the population.

Question 1
General Knowledge

Discuss three applications of genetic algorithms in real-world phenomena. Give references.

(5 Marks)
(CO1 PO1)

Question 2
Python: Search Algorithms (Genetic Algorithm)

Generate a bit pattern with predefined parameters from genetic algorithms. You are required to consider this condition as follows:

1. Population set up is 300.
2. The formula used in the preceding function reaches its maximum value when the number of one equal 50.
3. The length of all individuals is 80.
4. When the number of ones equals 50, the return value would be 80.
5. Number of generations is 50.

(5 Marks, CO2PO2)
(15 Marks, CO3PO3)

Save your work in both .py and PDF formats. Name your files using the following format: StudentID_LabX. Submit both files through the Kalam platform by 10th October 2025, 11:59 PM. In addition, deploy your Streamlit application and include the public URL to your deployed app and GitHub repository link inside your report. Late submissions will only be considered with prior approval.

Pusat Sains Matematik	**SUBJECT: BSD3513** **INTRODUCTOION TO ARTIFICIAL INTELLIGENCE**	**MARKS**: 25(5%)
	TOPIC: Chapter 2: Search Algorithms	
	LAB REPORT 2	

NAME: **STUDENT ID:** **SECTION:**

Mark for CO1: /5

Rubric for CO2.

Instruction: For CO2, assess each item using the given scales.

Demonstrate critical thinking ideas of artificial intelligence knowledge in problem-solving situation.								
Item Assessed (Cognitive)	**Very Poor 0**	**Poor 1**	**Fair 2**	**Good 3**	**Very Good 4**	**Excellent 5**	**Weigh tage**	**Score**
Apply and analyse relevant artificial intelligence knowledge.	The work has not done.	Poorly applied and analysed relevant artificial intelligence knowledge and results.	Applied and analysed relevant artificial intelligence knowledge but failed to achieve successful results.	Applied and analysed relevant artificial intelligence knowledge but arrive at satisfactory results.	Applied and analysed relevant artificial intelligence knowledge to arrive at successful results.	Applied and analysed relevant artificial intelligence knowledge to arrive at excellent results.	0.5	
Using logical, rational or problem-solving appropriate to the artificial intelligence problems.	The work has not done.	The work needs to demonstrate logical, rational or problem-solving understanding appropriate to the artificial intelligence problems.	The work has demonstrated some logical, rational or problem-solving understanding appropriate to the artificial intelligence problems.	The work has demonstrated logical, rational or problem-solving understanding appropriate to artificial intelligence problems.	The work has demonstrated a thorough, logical, rational or problem-solving understanding appropriate to artificial intelligence problems.	The work has demonstrated a thorough and classy logical, rational or problem-solving understanding appropriate to artificial intelligence problems.	0.5	
						Total Score	**1**	**/5**

Rubric for CO3.

Instruction: For CO3, assess each item using the given scales.

CO3: Develop an artificial intelligence system prototype using appropriate software.							
Item Assessed (Cognitive)	**Very Poor 0**	**Poor 1**	**Fair 2**	**Good 3**	**Very Good 4**	**Excellent 5**	**Score**
Utilizing the appropriate tools / software effectively	No relevant tool used.	Tools used but did not enhance solution or information clarity.	Tools used but with limited enhancement; minimal functionality demonstrated.	Tools used appropriately to produce a functional solution with clear output.	Tools used effectively to enhance clarity, performance, and solution quality.	Tools used optimally with advanced features, clear design, and effective interaction to display the solution.	
Code functionality, clarity & structure	No code constructed.	Code incomplete or mostly non-functional; unclear and poorly structured.	Partially functional code; errors present; structure somewhat difficult to follow.	Mostly functional code with minor errors; clear structure and readable.	Fully functional and well-structured code; clearly commented and readable.	Fully functional, optimized, modular, and well-documented code; demonstrates best practices.	
Deployment & Version Control (GitHub + Streamlit or etc)	No deployment and no GitHub repository.	GitHub repo exists but incomplete OR app deploy attempt failed.	GitHub repo available with basic files; deployment page exists but app not functioning correctly.	Working deployment provided; GitHub repo contains main code files.	Working deployment with complete repository (README, code, requirements); clearly accessible.	Fully deployed app with professional GitHub repo (README, screenshots, instructions, modules, tags); live Streamlit app runs smoothly and reliably.	
						Total Score	**/15**