CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY

FACULTY OF TECHNOLOGY & ENGINEERING

SMT. KUNDANBEN DINSHA PATEL DEPARTMENT OF INFORMATION TECHNOLOGY

Subject Name: Artificial Intelligence
Subject Code: IT473

Semester: B.Tech 7th sem
Academic Year: 2022-23

Note: The laboratory will emphasize the use of Artificial Intelligence-Search, Game plying, Logic, NLP & Expert System Shells with Python Programming.

Instructions:

1. **All Practical must be performed individually and all experimental results must be uploaded on your respective google classroom**.
2. All Practical must be evaluated regularly in the laboratory by concern Lab Teacher.
3. Each practical answer would be evaluated as learning outcome.

Practical List

Sr. No.	Aim of the Practical	Hrs	COs	POs	PEOs
Pre Req.	Introduction to Prolog and History, Python Programming. Installation & Configuration of Python. Along with its all major editors, IDLE, Anaconda, Jupyter, Interpreter, etc.	-	-	-	-
1.	The 8 puzzle consists of eight numbered, movable tiles set in a 3x3 frame. One cell of the frame is always empty thus making it possible to move an adjacent numbered tile into the empty cell. Apply intelligence to solve given problem and Implement it.	2			
2.	Implement Uninformed Search Strategies: BFS, DFS, and ID (Iterative Deepening-Idea of Game Searching (Chess, Checkers, Tic-Tac-Toe, Puzzle Game etc.))	4			
3.	Implement Informed (heuristic) search strategy for optimal shortest path and traffic navigational system. (Hint: A* algorithm by mentioning OPEN and CLOSED List and it takes a heuristic function as Euclidian Distance Equation) Implement Informed (heuristic) search strategy for problem reduction and for planning good algorithms. (Hint: AO*-AND/OR graph by mentioning OPEN and CLOSED List).	4			
4.	Getting Started With Python Logic Programming using Kanren and SymPy packages • Compare expressions and find out unknown values. • Form and manipulate logic expressions using symbolic and Boolean values with SymPy package.	4			
5.	Implement Game Search algorithm that seeks to decrease the number of nodes that are evaluated by the minimax algorithm in its search tree. It is an adversarial search algorithm used commonly for machine playing of two-	2			

<table>
<tr><td></td><td>player games (Tic-tac-toe, Chess, Go, etc.). It stops evaluating a move when at least one possibility has been found that proves the move to be worse than a previously examined move. Such moves need not be evaluated further.</td><td></td><td></td><td></td><td></td></tr>
<tr><td>6.</td><td>Understand Text Summarization and Implement your own summarizer in python.</td><td>2</td><td></td><td></td><td></td></tr>
<tr><td>7.</td><td>Implement Bayes rule with probabilistic inference for reasoning under uncertainty.</td><td>2</td><td></td><td></td><td></td></tr>
<tr><td>8.</td><td>Implement Deep Q- Learning (Deep Q-Network) in Reinforcement Learning (RL) using Python
Question: Compare Deep RL vs. Deep Learning</td><td>2</td><td></td><td></td><td></td></tr>
<tr><td>9.</td><td>Implement following Computer Vision task on Images using OpenCV.
<table>
<tr><td>Reading, Writing and Displaying Images</td><td>Image Filtering</td></tr>
<tr><td>Changing Color Spaces</td><td>Image Contours</td></tr>
<tr><td>Image Rotation</td><td>Scale Invariant Feature Transform (SIFT)</td></tr>
<tr><td>Image Translation</td><td>Speeded-Up Robust Features (SURF)</td></tr>
<tr><td>Image Segmentation (Watershed Algorithm)</td><td>Feature Matching</td></tr>
<tr><td>Edge Detection</td><td>Face Detection</td></tr>
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<tr><td>10</td><td>Kaggle machine learning challenges:
Predicting Molecular Properties
Detect objects in varied and complex images
Detect pairs of objects in particular relationships
Learn computer vision fundamentals with the famous MNIST data
Predict survival on the Titanic and get familiar with ML basics
Predict sales prices and practice feature engineering, RFs, and gradient boosting
ImageNet Object Localization Challenge. Identify the objects in images
Predict Future Sales</td><td>4</td><td></td><td></td><td></td></tr>
<tr><td>11</td><td>Case Study1: Natural language processing and Expert System.
Case Study2: Briefly mention any three artificial intelligence libraries in Python</td><td>-</td><td></td><td></td><td></td></tr>
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