Midterm Preparation Guide

Concepts:

- Define Artificial Intelligence and explain its main goals.
- Describe the history and evolution of AI.
- Distinguish between symbolic AI, statistical learning, and hybrid approaches.
- Identify different learning types in AI and their real-world applications.
- Define Good Behavior: The Concept of Rationality
- Key Questions from Lesson 1 – Introduction to AI

- Formulate a problem in terms of search (states, actions, goal test).
- Define uninformed (blind) search strategies (BFS, UCS, DFS) and describe their properties.
- Compare different search algorithms based on criteria of completeness, optimality, time complexity, and space complexity.
- Determine which uninformed search strategy is best suited for a given problem.
- Determine standardized problems.
- Solve a given problem by using a search algorithm
- Comprehension and Study Questions from Lesson 2 – Problem Solving by Searching

- Define supervised learning and distinguish it from other forms of learning.
- Explain the structure of a decision tree and how it is used for classification.
- Describe the basic algorithm for learning a decision tree from data.
- Explain the solution of a tree model for a given problem.
- Explain Entropy by means of its calculation
- Explain Information Gain calculation method and its purpose
- Discussion Questions from Lesson 6 – Statistical Learning: Decision Trees

Question Types:

- Definition questions: You should be able to define a concept with your own words.
- Fill in blanks questions for a term
- Calculation questions. Easy calculations without a need for a calculator
- Step-wise solution questions. An algorithm application to a given problem. You should be able to show each step clearly.

Suggestions:

- As stated in lectures, you should keep the book as your main reference.
- **Given lecture notes:** They define the limits of subjects to study. They are not for learning, but keeping your study in order.
- **Slides:** They would not help much since they don't include definitions in words. You should be able to explain concepts using words and sentences. But they help to understand where to focus on the subject.