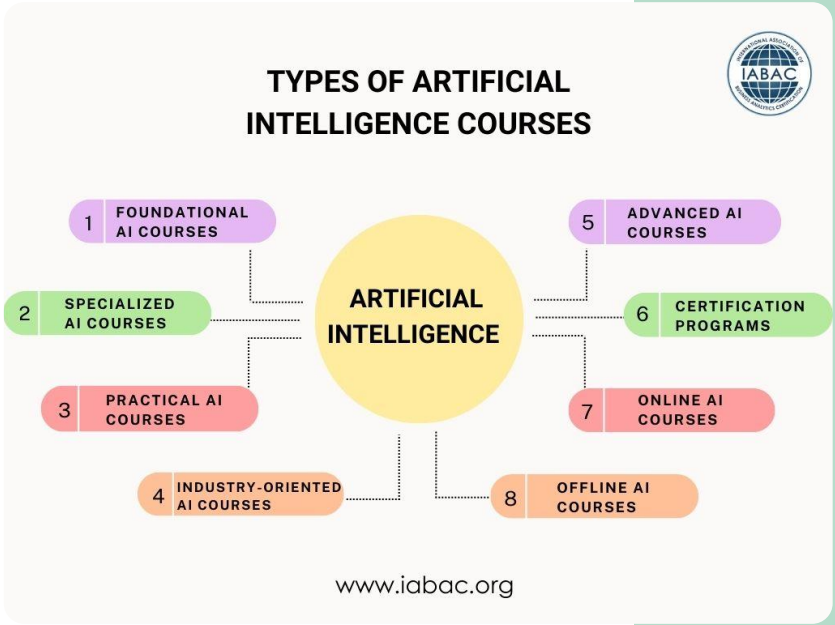
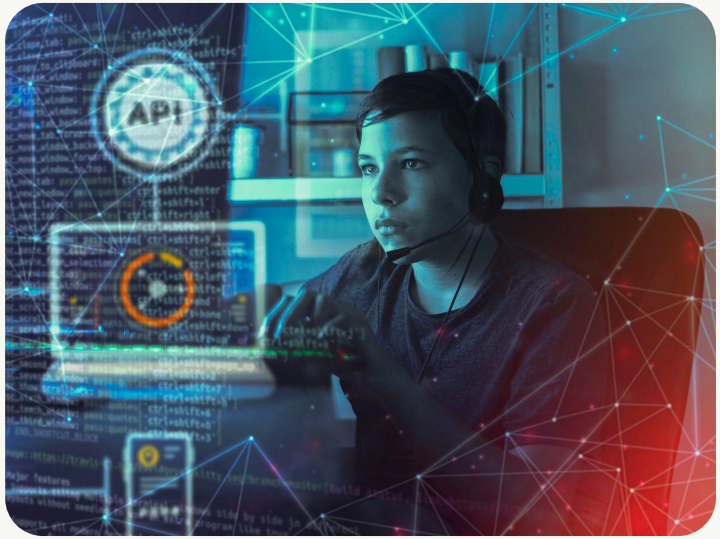
Introduction to My AI Course Journey

Welcome to my presentation on my journey through the **AI course** at university. This course provided me with foundational knowledge and practical skills in artificial intelligence, guided by the expertise of our instructor, Razorshi Prozzwal Talukder.





Instructor Introduction: Razorshi Prozzwal Talukder

Razorshi Prozzwal Talukder is an expert in artificial intelligence, with a wealth of knowledge in both theory and practical applications. His engaging teaching style made complex concepts more accessible, fostering an environment of curiosity and exploration that enhanced my learning experience.

Razorshi Prozzwal Talukder

Expert in AI

Course Purpose

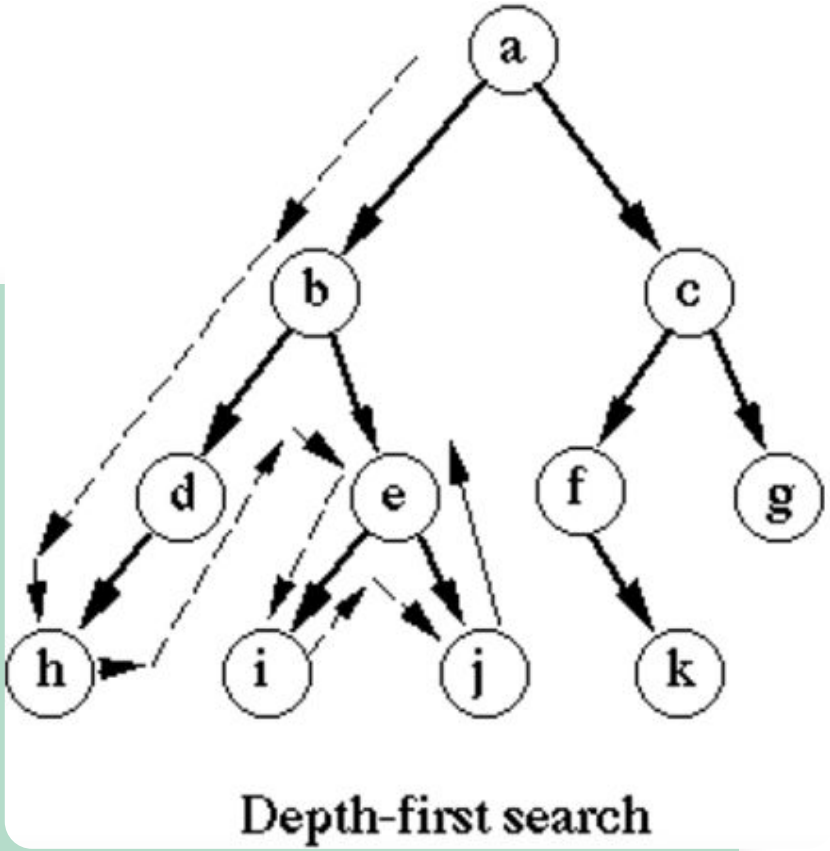
Foundational Knowledge: The course aimed to develop a strong foundation in artificial intelligence, covering essential theories and concepts.

- **Theoretical Frameworks & Real-World Applications**: We explored various theoretical frameworks and their applications in solving real-world problems.
- **Application in Problem-Solving**: We applied AI techniques in problem-solving scenarios and game-based systems, bridging theory with practice.

Key Topics Covered

AI Terminologies: We learned essential AI terminologies that form the basis of understanding the field.

- **Constraint Satisfaction Problems**: Explored how to solve problems with specific constraints effectively.
- **Problem-Solving Strategies**: Investigated various strategies for effective problem-solving in AI contexts.
- **Game Theory Applications**: Studied how game theory principles apply to AI, enhancing decision-making processes.

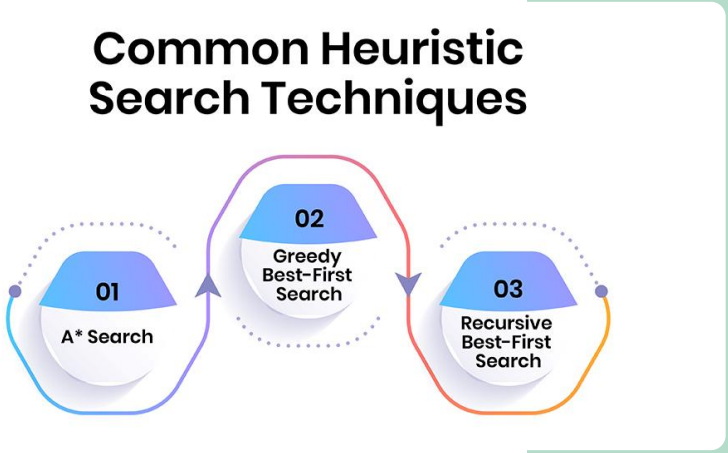


Depth-first search

Uninformed Search Algorithms

Overview of Uninformed Search Algorithms:

- **Breadth-First Search (BFS)**: A fundamental search algorithm that explores all neighbors at the present depth before moving on.
- **Depth-First Search (DFS)**: An algorithm that explores as far as possible along a branch before backtracking.
- **Depth-Limited Search (DLS)**: A variation of DFS that limits the depth of the search.
- **Iterative Deepening Search (IDS)**: Combines the benefits of BFS and DFS, gradually increasing the depth limit.
- **Bidirectional Search**: A search strategy that simultaneously explores from both the start and goal states.



Informed Search Algorithms

Heuristic-Based Search

Utilizes heuristics to guide the search process, improving efficiency.

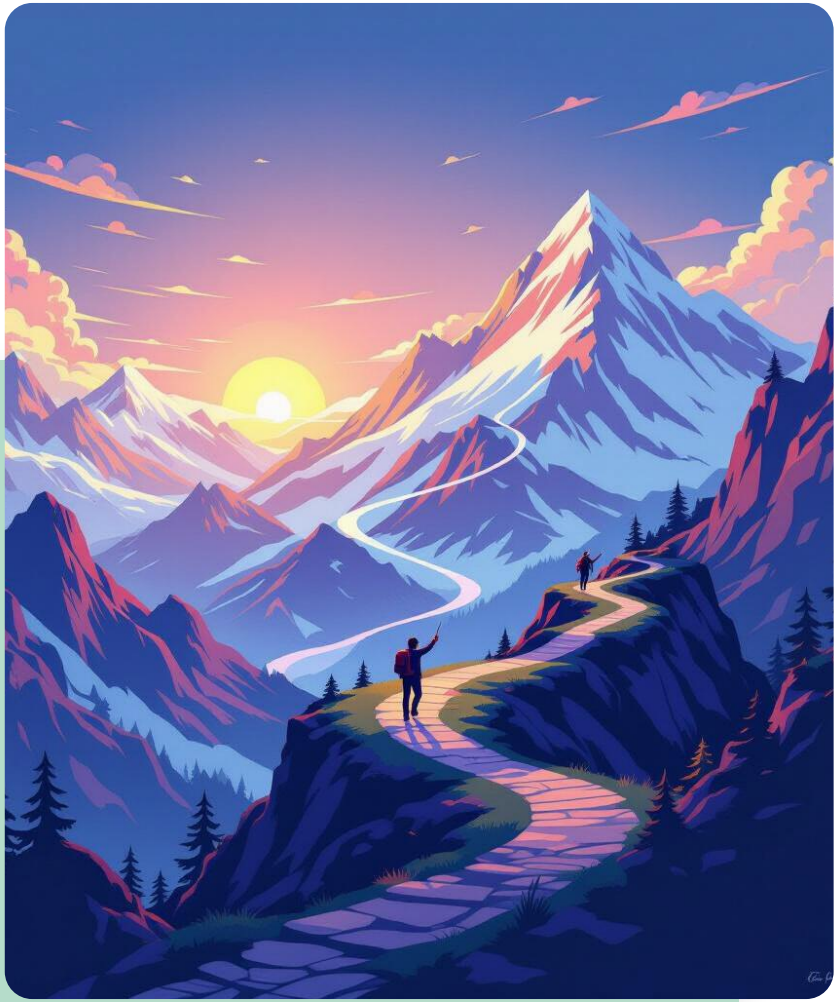
Best-First Search

An algorithm that selects the most promising node based on a heuristic.

A* Algorithm

Combines features of Dijkstra's and Best-First Search for optimal pathfinding.

AO* Algorithm



Optimization & Local Search

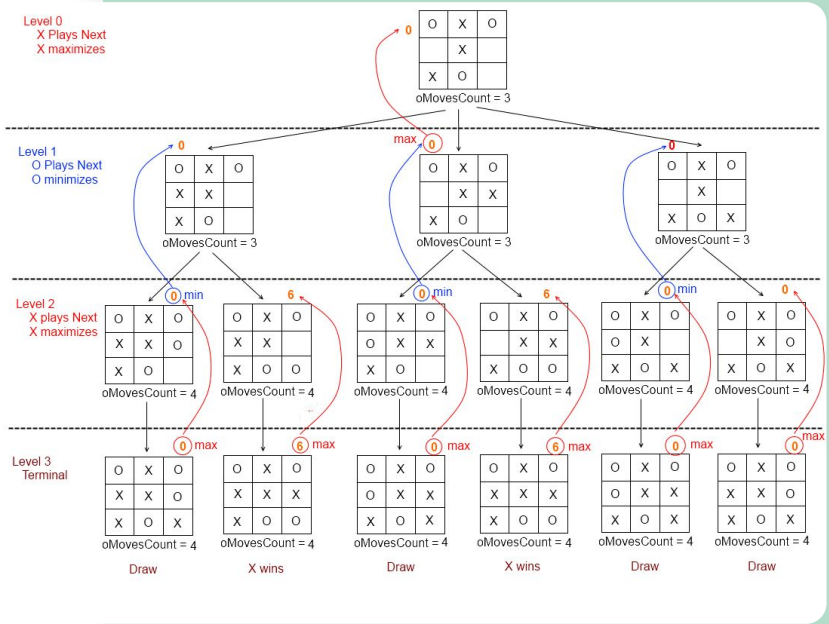
- **Hill Climbing**: A local search algorithm that continually moves towards increasing value.
- **Beam Search**: An optimization of breadth-first search that limits the number of nodes explored at each level.

Game Playing Algorithms

- **Minimax Algorithm**: A decision-making algorithm for minimizing the possible loss in a worst-case scenario.
- **Alpha-Beta Pruning**: An optimization technique for the minimax algorithm that eliminates branches that won't be selected.

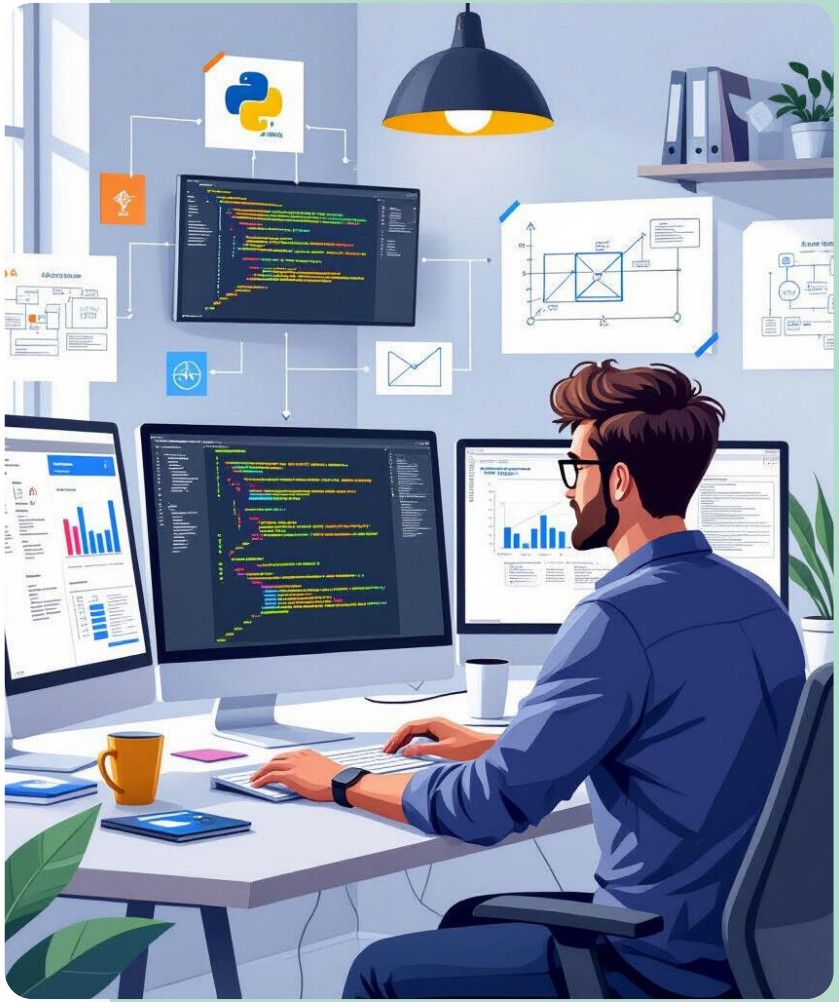
Practical Implementations

- **Tic Tac Toe AI (Minimax)**: Implemented a Tic Tac Toe game using the minimax algorithm to determine optimal moves.
- **Chess AI Components (Alpha-Beta)**: Developed components for a chess AI utilizing alpha-beta pruning for efficiency.
- **Smart Rock Paper Scissors (Pattern-based AI)**: Created a pattern-based AI to enhance the traditional game of Rock Paper Scissors.



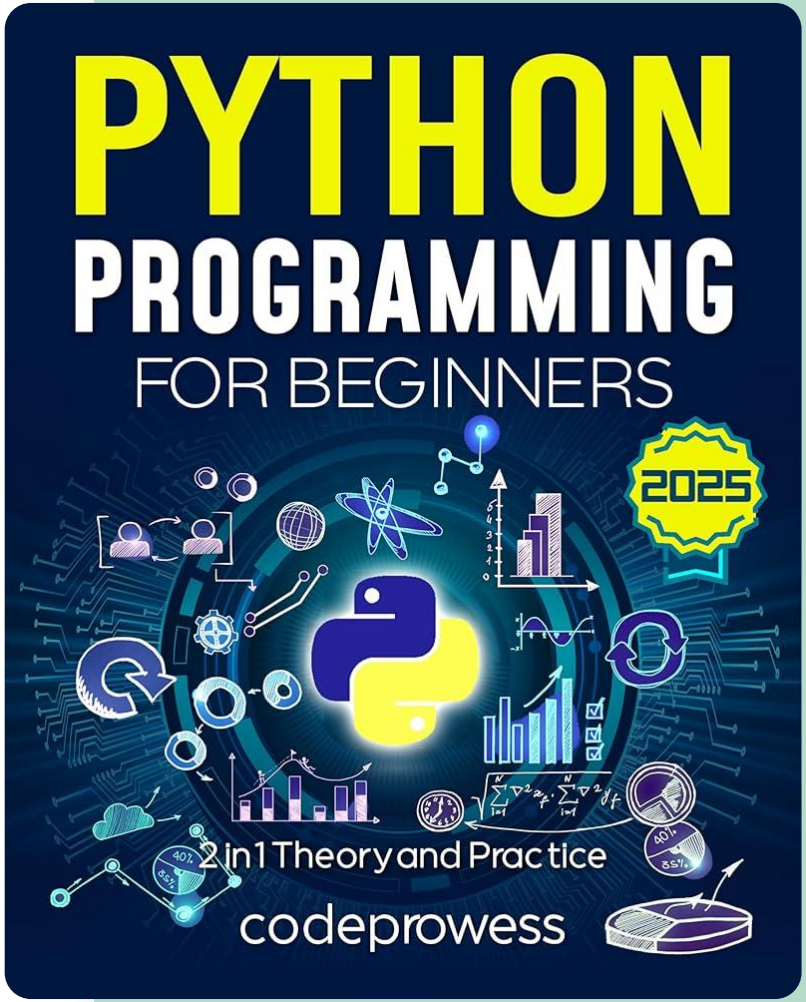
Skills Gained

- **Algorithmic Thinking**: Developed strong algorithmic thinking skills essential for problem-solving in AI.
- **Python-Based AI Implementation**: Gained proficiency in implementing AI algorithms using Python.
- **Game Strategy Design**: Learned to design effective strategies for various games.
- **Heuristic Development**: Acquired skills in developing heuristics to optimize search processes.



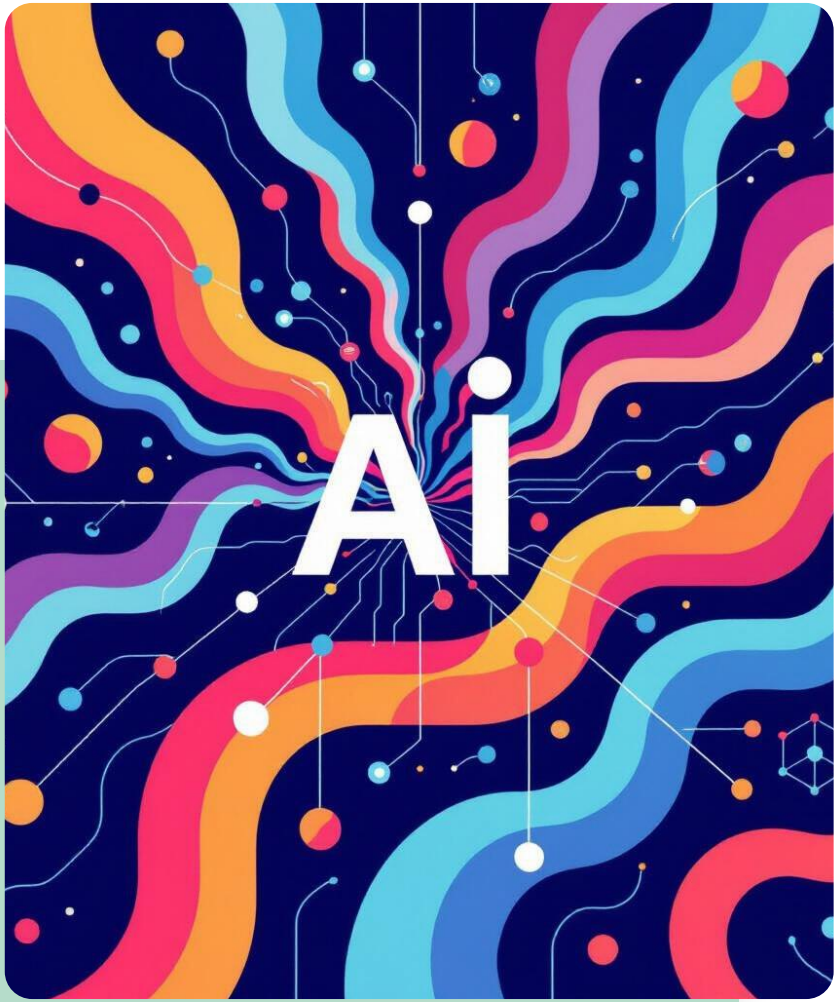
Tools & Languages Used

- **Python**: Utilized Python as the primary programming language for AI implementations.
- **Custom Graph Data Structures**: Created custom data structures to facilitate algorithm development.
- **Pseudocode for Planning**: Employed pseudocode to outline algorithms before implementation.



Challenges & Learning Experience

- **Understanding Complex Heuristics**: Faced challenges in grasping complex heuristics and their applications.
- **Debugging Recursive Logic**: Encountered difficulties in debugging recursive logic in search algorithms.
- **Adapting Strategies to Game Mechanics**: Learned to adapt strategies effectively to fit different game mechanics.



Future Goals

Solid AI Foundation: The course provided a solid foundation in AI principles, preparing me for advanced research.

- Future Exploration: I plan to explore **Machine Learning**, **Natural Language Processing**, and **Deep Learning** in my future studies.

Conclusion

Thank you for joining me in exploring my journey through the AI course. The skills and knowledge I've gained will undoubtedly aid me in my future endeavors in artificial intelligence.