**AP CS Problem Sets**

1. **Strings & Data Storage**

* Lab 01: Data Storage – Modes & Kth Values
* Lab 02: Data Storage – Blackjack
* Lab 03: Strings – String Coder
* Lab 04: Strings – Pig Latin

1. **Recursion**

* Lab 05: Recursion – Area-Fill
* Lab 06: Recursion – Matrix Recreate

1. **Searches & Sorting**

* Lab 07: Searches – Linear Search, Binary Search
* Lab 08: Sorting – Bubble Sort, Selection Sort, Insertion Sort
* Lab 09: Sorting – Merge Sort, Quick Sort, Heap Sort
* Lab 10: Hashing – Hash Chaining, Linear Probing, Rehashing

1. **Data Structures**

* Lab 11: Lists – Josephus
* Lab 12: Lists – Cards & Texas Hold-Em’
* Lab 13: Stacks & Queues – Infix & Postfix
* Lab 14: Stacks & Queues – McDonald’s Burger Store
* Lab 15: Priority Queues – McDonald’s VIP Burger Store
* Lab 16: Collections – Sets of Letters, Dictionary
* Lab 17: Trees – Binary Expression Tree Traversal
* Lab 18: Trees – Binary Search Tree
* Lab 19: Trees – Huffman & Huffman Decode
* Advanced Readings – B Tree, RB Tree, AVL Tree, Fibonacci Heap, van Emde Boas Tree

1. **Graphs – Algorithms and Applications**

* Lab 20 – Edgelist, Warshall-Floyd Algorithm
* Lab 21 – Dijkstra’s Algorithm
* Lab 22 – Team Builder
* Advanced Problem – Kruskal, Robo-Courier

1. **Additional Topics**

* Lab 23: Graphics – Bugs & Turtles
* Lab 24: Visualizations – Animations
* Lab 25: Modeling – Viruses [MITOCW]

**Artificial Intelligence Problem Sets**

1. **Graphs & Searches – Word Ladders & Romania**

* Lab 1 – Neighbors, Random Ladders
* Lab 2 – DFS, BFS, DFSID, Bidirectional Search

1. **Heuristics – Romania & Sliding Tile Puzzle**

* Lab 3 – Uniform Cost Search, A\* Search
* Lab 4 – Incorrect Tiles, Manhattan Distance, Linear Conflict

1. **Local Search – The N-Queens Problem**

* Lab 5 – Hill-Climb
* Lab 6 – Stochastic Search, Beaming, Simulated Annealing
* Lab 7 – Genetic Algorithm

1. **Game Trees – GHOST Word Game**

* Lab 8 – Trie
* Lab 9 – Moderator
* Lab 10 – Recursive Search

1. **Mini-Max and Pruning – Reversi or Connect 4**

* Lab 11 – Mini-Max Algorithm & Alpha Beta Pruning

1. **Machine Vision – Edge Detection**

* Lab 12 – Gaussian Smoothing Mask
* Lab 13 – Canny Edge Detection

1. **Agent-Based Models – Schelling**

* Lab 14 – Schelling’s Agent Model
* Lab 15 – Schelling’s Agent Model Analysis

1. **Constraint Solvers – Map Coloring & Sudoku**

* Lab 16 – Australia & America Coloring
* Lab 17 - Sudoku

1. **Neural Networking**

* Lab 18 – MIT OCW Problem Set #5