COMP4431 Artificial Intelligence
Quiz 01 Solution
(6% of overall course)

I. History of AI

Question 1. Multiple Choice Questions (2%)

1. C
2. A
3. C
4. D

II. Generative AI & Heuristic Search

1. State **two** key limitations of generative AI. (1%)

   (state any **two** limitations)

   Generative AI has limitations **like producing incorrect outputs** because it relies on probabilities, which can lead to errors in important areas like **healthcare**.

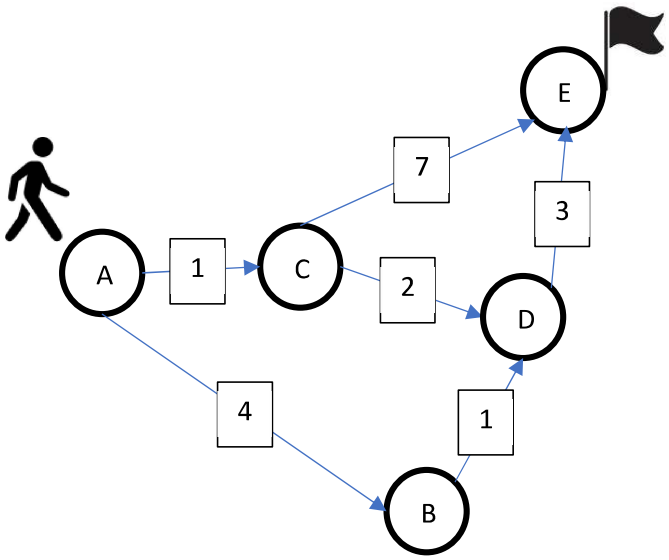
   It can also **replicate biases from the data** it was trained on, resulting in **unfair outcomes**, like generate image with mainly male workers.

   There are **copyright concerns**, as AI might create content similar to existing works without permission.

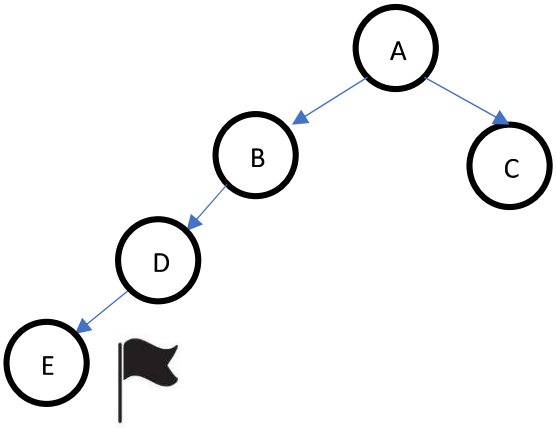
   (Or other acceptable answer)

2. Consider the following graph with Nodes A, B, C, D, and E. Arrows between nodes indicate the edge, and the cost of the edge is also stated on it. E.g. the edge between A and B has a cost of 4.

   Now, solve the path-finding problem with the starting point at A, and the goal point at E with the method stated in the following sub-question (a) and (b).



a. Draw the final search tree of Depth-First Search (DFS) (1%)
(Always expend the node based on the alphabetical order, e.g. expend node B earlier than node C)



b. What will be the move when using an A* search (i.e. the path passing through the nodes)? Please show your steps with the evaluation functions f(n) whenever expending a node n. (2%)

Start at node A, Expand A,

consider Node B and C:

f(B) = g(B) + h(B) = 4 + 2 = 6

f(C) = g(C) + h(C) = 1 + 4 = **5 (lower one)**

Choose C (because of lower f value), expand C,

consider D and E:

f(D) = g(D) + h(D) = 3 + 1 = **4 (lower one)**

f(E) = g(E) + h(E) = 8 + 0 = 8

Choose D (lower f value), expand D,

we arrived the goal node E !

Thus, goal node E reached **with path A→C→D→E and total cost 6**.