Addis Ababa University

School of Information Science and Engineering

Fundamentals of AI

Assignment 1(20%)

1. Consider Figure 1 (A generic state space graph for traveling Ethiopia search problem) to solve

the following problems.

1.1 Convert Figure 1, a State space graph for traveling Ethiopia search problem, into some

sort of manageable data structure such as, stack or queue.

1.2 Write a class that takes the converted state space graph, initial state, goal state and a

search strategy and return the corresponding solution/path according to the given strategy.

Please consider only breadth-first search and depth-first search strategies for this question.

2. Given Figure 2, a state space graph with backward cost for the traveling Ethiopia search

problem.

2.1 Convert Figure 2 into some sort of manageable data structure such as, stack or queue.

2.2 Assuming “Addis Ababa” as an initial state, write a program that use uniform cost search

to generate a path to “Lalibela”.

2.3 Given “Addis Ababa” as an initial state and “Axum”, “Gondar”, “Lalibela”, Babile,

“Jimma”, “Bale”, “Sof Oumer”, and “Arba Minch” as goal states;in no specific order, write

a customized uniform cost search algorithm to generate a path that let a visitor visit all those

goal states preserving the local optimum.

3. Given Figure 3, a state space graph with heuristic and backward cost. Write a class that use

A\* search to generate a path from the initial state “Addis Ababa” to the goal state “Moyale”.

4. Assume an adversary joins the Traveling Ethiopia Search Problem as shown in Figure 4. The

goal of the agent would be to reach a state where it gains a good quality of Coffee. Write a class

that shows how MiniMax search algorithm directs an agent to the best achievable destination.