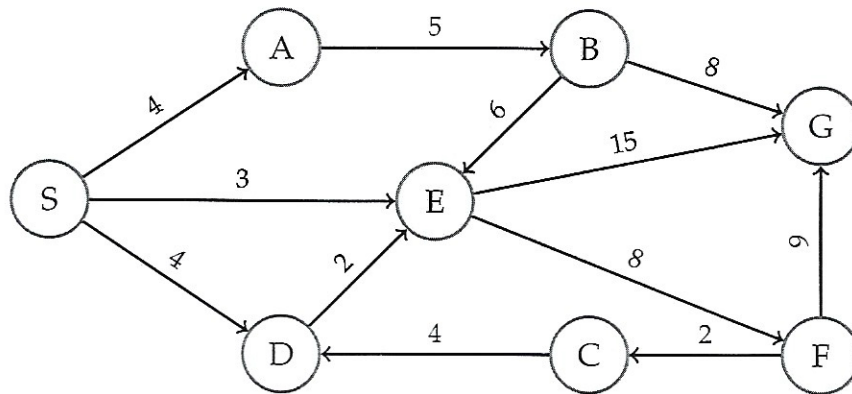# Lab 05

Student name:

Course: *CS 4, Fall 2024* – Professor: *Carlos Moreno*
Due date: *9/18/24 @ 8:00pm*

For this lab assignment, you will apply a mixture of search algorithms to the state space graph below. Assume that when expanding a node, the EXPAND function yields successors in reverse alphabetical order (e.g., when expanding node S, the first successor node is E).

Part A

Apply the depth-first search algorithm to find a solution. Draw out the search tree to show this. What is the solution that DFS will return? What is the total path cost of that solution?

Solution total path $15 + 3 = 18$

solution is circled
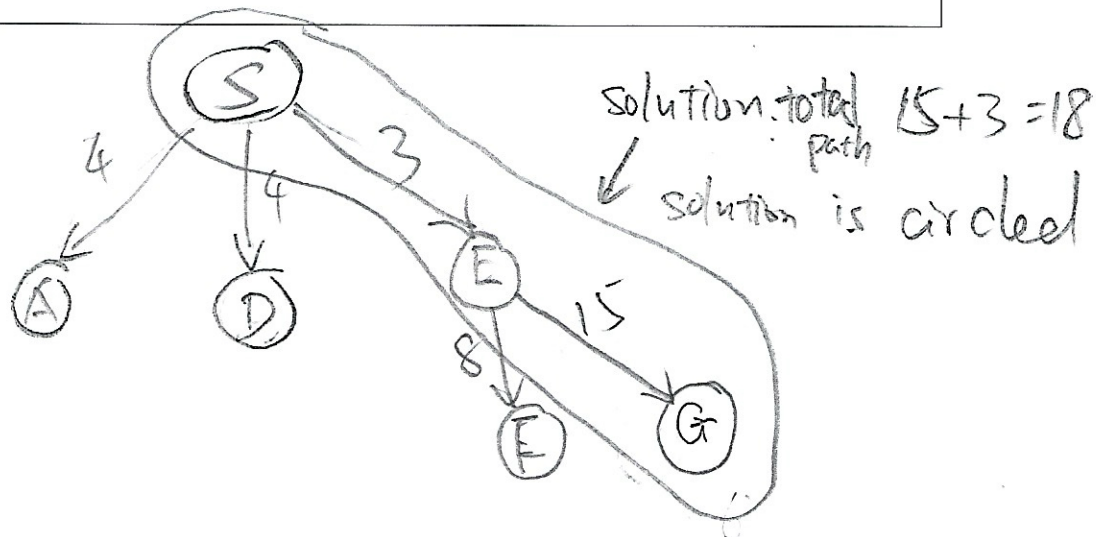
Part B

Suppose the problem is using the following heuristic function $h(n)$:

State	Estimate
S	2
A	2
B	1
C	3
D	2
E	1
F	1
G	0

Apply the greedy best-first search algorithm to find a solution. Draw out the search tree to show this. What is the solution that GBFS will return? What is the total path cost of that solution?
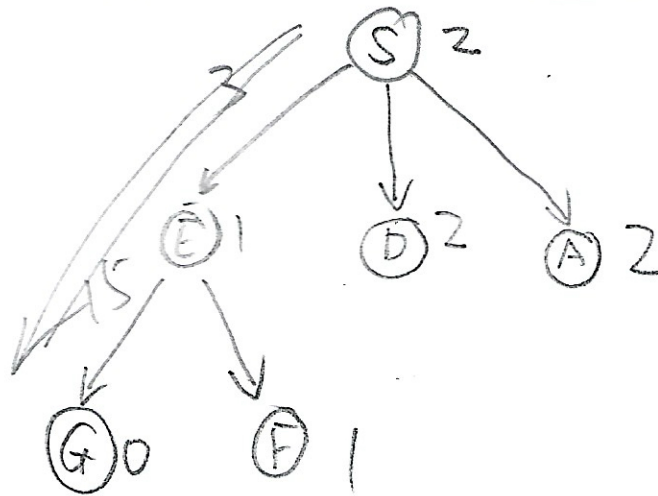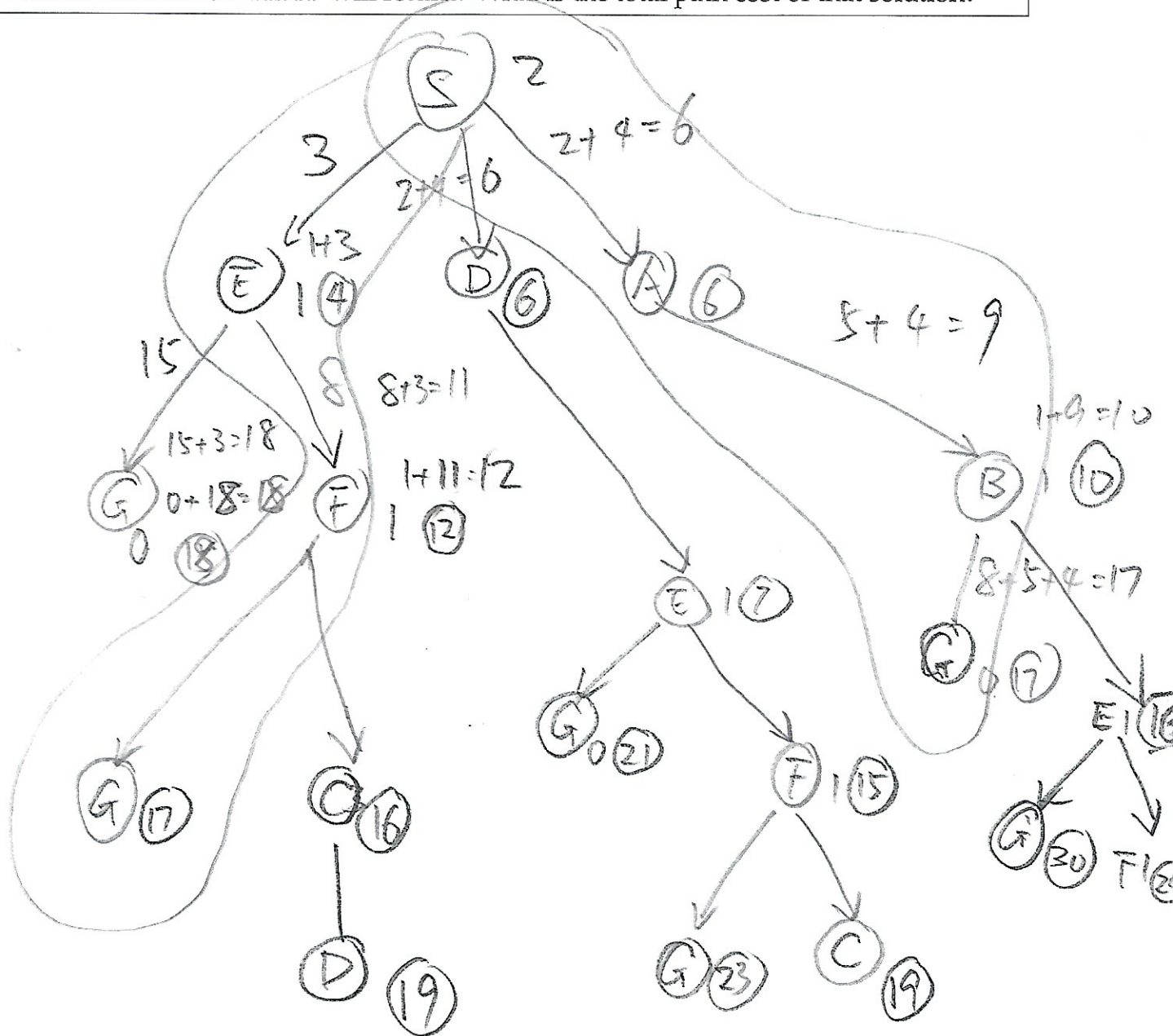

Total Path Cost is $3+15=18$

Part C

Apply the A* search algorithm to find a solution. Draw out the search tree to show this. What is the solution that A* will return? What is the total path cost of that solution?

Two solutions that A* returned.

Total path cost is 17