

Intro to AI (331)

Homework 03

Borrelli

Due: Wednesday, June 16th, 2021 by 11:59pm

- Be sure to put your NAME and Section number on the first page.
- You must submit your solution to MyCourses in **PDF** format **only**.
- Late work is not accepted.
- Only the last thing submitted to the dropbox will be accepted.

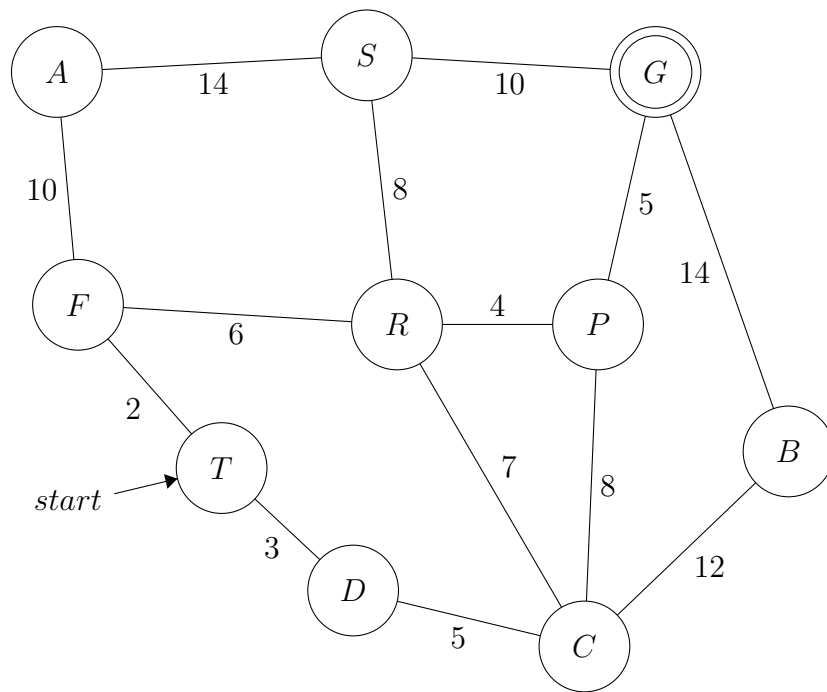
1. **(14 Points)** Trace the operation of (a) Greedy Best First Search and (b) A* to the problem of getting from node T to node G below using the heuristic of straight-line distance. Show the sequence of nodes that the algorithms will consider and the f , g , and h values for each node. For paths that would result in loops, only show the repeated node, do not expand its children. (c) You may have noted that A* seems to return a sub-optimal path. Why is that?

h_{SLD} :

$A = 20$ $B = 10$ $C = 12$

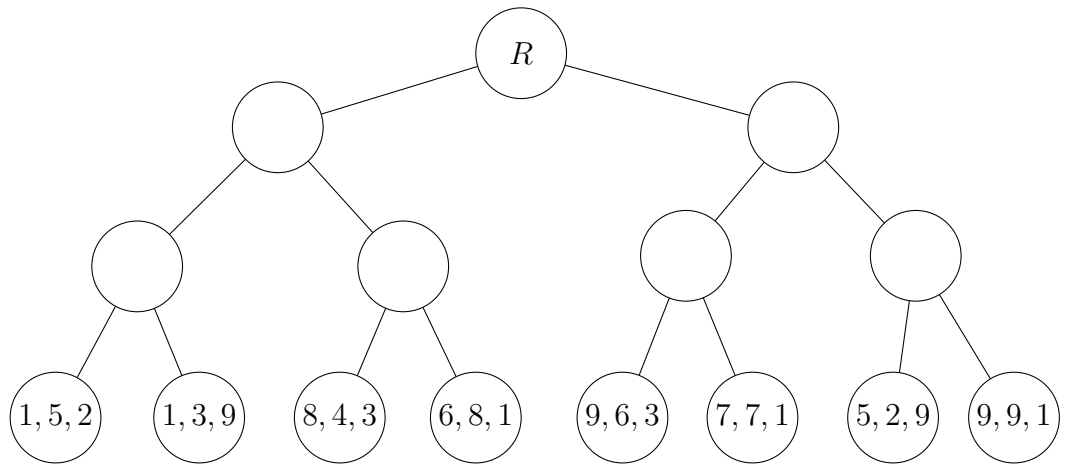
$D = 13$ $F = 25$ $P = 4$

$R = 10$ $S = 8$ $T = 22$



2. **(5 Points)** Describe Hill-climbing search. What are some of its limitations?

3. (10 Points) Look at *Figure 5.4* on Page 166 of the R&N book.



- (a) Fill in the the above **3 player** minimax search tree.
 - (b) If you had encountered a tie in one of the comparisons for part (a), explain a reasonable approach for dealing with this.
4. (14 Points) Create and fill-in a Minimax search tree for a 9 token game of Nim. Assume that MAX makes the first move. Fill in the utility value for each node generated.