AI

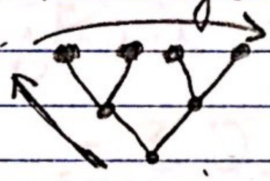
Morgan Ciliv HW #1

1) <u>Hogwarts Helper</u>

.1 • I'd represent a state for this problem as an array of pairings of elements from R and elements of C.

• The start state is an empty array.

• The succesors are generated by traversing back and forth through the array R and array C. As you go across the tree ~~you~~ you increment which room.



As you go up th tree you increment which class. Moreover, if you go down or back a step you delete the most recent pairing.

• The goal test is a check whether the the current pairing is valid by looping through that class's list of unacceptable rooms. Also, there is a check to all the previous pairings on the stack to make sure that none of them have the same classroom AND meeting time.

Scanned by CamScanner

2). • No, it doesn't make sense to describe a solution as optimal/suboptimal because there is no cost function. A solution works or doesn't work — there is no in between.

• Based on how I've set up the search tree with choice of classroom from C as going across. The maximum branching factor is the size of the array C.

2) There and Back Again

1.

Start: 1) Toolbank

2) Tuckborough

3) Stock

4) Whitfurrows

5) Budgeford

Finish 6) Scary

2. To expand to By water at a maximum distance we solve for d...

$$13 + d < 10 + 30$$
$$-13 \qquad\qquad -13$$
$$d < 27$$

∴ The maximum length this path can be for A* search is 26

2.1 Admissibility

∴ nothing is exact of course.

Note: The following is a heuristic for the heuristic!
The actual distance must be greater than or equal to the Euclidean Distance.
My estimate of a good estimate for a heuristic is the Manhattan Distance or slightly or no greater than twice the Euclidean distance. Therefore anything over this I would consider not admissable and under this I would consider admissable. ∴

- Merry's is not admissable

  ∵ $3 \cdot MD(n) + \frac{3}{2} ED > [MD(n) \text{ or } 2 \cdot ED(n)]$

- Pippin's is admissable

  ∵ $\frac{1}{2} ED(n) < [MD(n) \text{ or } 2 \cdot E(D)]$

- Sam's: I don't know because I don't have enough information to make a clear estimate whether it's an overestimate or not as its so close to my approximation...

  $2 ED(n) \approx/= [MD(n) \text{ or } 2ED(n)]$