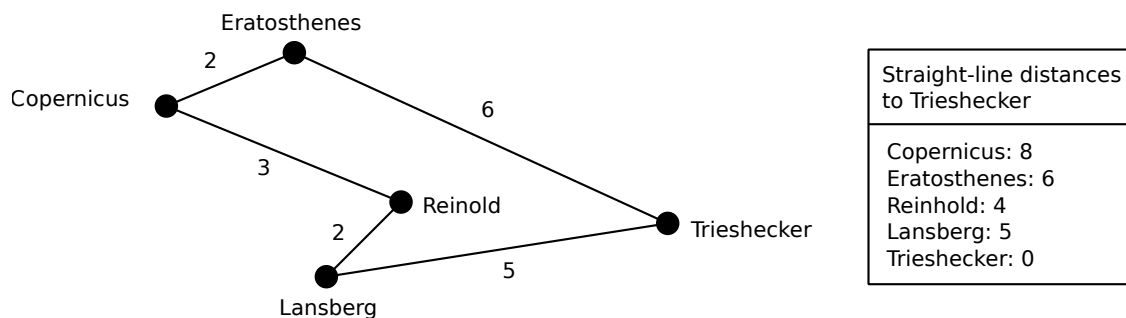


Uninformed search methods compared

1. Summarise the advantages and disadvantages of **depth-first search** and **breadth-first search**.
2. How does **iterative deepening search** obtain the advantages of both methods while avoiding their disadvantages?

Informed search methods

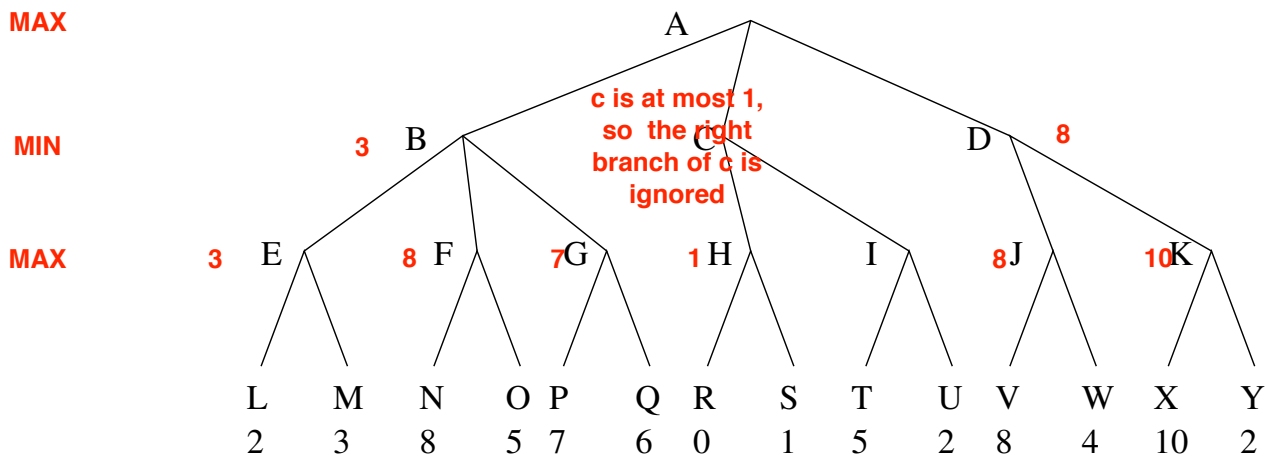
3. How do **informed search** methods differ from uninformed search methods?
4. What is **best-first search**?
5. What is a **heuristic**?
6. What is **greedy search**?
7. Describe the **A* search** algorithm. Why is it better than greedy search?
8. **Quiz:** Below is a map of navigable routes between craters on the moon. Assume you are at Copernicus (C), and are searching for a route to Trieshecker (T) using the A* algorithm, with straight-line distance as a heuristic (see table on the right). The fringe is initialised to (`copernicus[0+8=8]`). Write down what the fringe will look like at each subsequent iteration of the algorithm, using the same format for nodes: `position[path_cost+heuristic=total]`.



9. What is an **admissible** heuristic? Explain informally how an admissible heuristic guarantees A* search is optimal.

Adversarial search

10. Describe the **Minimax** algorithm for search in two-player games.
11. Consider the following game tree in which the static scores (in brackets at the tip nodes) are all from the first player's point of view. Assume that the first player is the maximising player (i.e. MAX), and that high numbers represent better scores for MAX.



- (a) Use Minimax to determine which move the first player should choose.
- (b) What nodes would not need to be examined using the alpha-beta pruning algorithm—assuming that nodes are examined in left-to-right order?