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1. PEAS Description of the Environment

Playing Soccer:

Performance Metric: Number of Goals

Environment: Soccer Field, Other Soccer Players (Teammates)

Partially observable (Can't see the whole field at once), Sequential Environment (A misplaced pass can influence the game), Dynamic (Conditions change constantly due to the ball moving and players moving), Continuous (Players), Stochastic (Environment)

Actuators: Dribble, Pass, Limbs

Sensors: Visual

Knitting a Sweater:

Performance Metric: Fully knitted Sweater, Good Quality

Environment: Fully observable (Full sweater can be seen at the same time), Static Environment (no changes until we move), Discrete Environment (individual stiches), Deterministic (knitting is done step by step)

Actuators: Knitting equipment

Sensors: Visual

Shopping for used AI books on the internet:

Performance Metric: Cheapest Book acquired

Environment: Partially observable, Sequential Environment, Dynamic (Prices may change),Discrete Environment, Stochastic Environment

Actuators: Computer Screen,

Sensors: Visual

Bidding on an Item at an auction:

Performance Metric: Item won at lowest possible price

Environment: Partially observable (Bids of other participants unknown), Sequential Environment, Dynamic (Bids change), Discrete Environment, Stochastic (outcome is not 100% sure)

Actuators: Raise Hand to bid on item, give up on bid

Sensors: Visual

2. Formulation of Problems

1 Problem

Initial State: First box with key

States: different boxes opened

Action: Open next box with key

Goal Test: Open box with banana

Path Cost: One key per move

2 Problem

Initial State: ABABAECCEC

States: stages with changed letters

Action: change a pair of letters to e or another pair of letters

Goal Test: sequence E

Path Cost: One per transformation

3 Problem

Initial State: first unpainted floor square

States: painting different squares

Action: Paint or move

Goal Test: whole floor painted

Path Cost: 1 per move

4 Problem

Initial State: 13 rows of containers

States: Different containers on the ship

Action: pick up and drop container

Goal Test: unloaded ship

Path Cost: 1 per container

5 Problem

Initial State: 2 friends on different positions on a map

States: different positions on map

Action: move from I to j

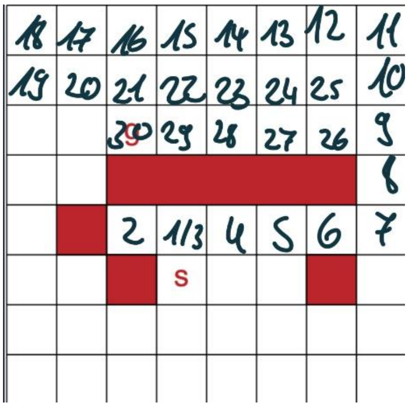
Goal Test: meet as quickly as possible

Path Cost: road distance per move

3.

Depth first search would be more suitable for this problem as breadth first search would explore the first node then proceed to explore the neighbouring nodes and depth first search on the other hand would try to explore the first node completely with all it's child nodes and then proceed to do the same for the adjacent nodes. So, the goal would be easier to reach when using depth first search. Especially when the number of containers rises, the amount of different states that exist would render the breadth first search inefficient.

4.



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		30 G	29	28	27	26	9
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5. When using Depth First Search in alphabetical order the result would be:

A to B to D to G = Cost of 5

Breadth-First Search:

A to C to B to D to G = Cost of 4