

Spike: 8

Title: GOAP

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Goals / deliverables:

Create a GOAP simulation that demonstrates the effectiveness of the technique in considering long-term outcomes of actions (related to side-effects and/or time delays) and can plan and act intelligently.

Technologies, Tools, and Resources used:

List of information needed by someone trying to reproduce this work

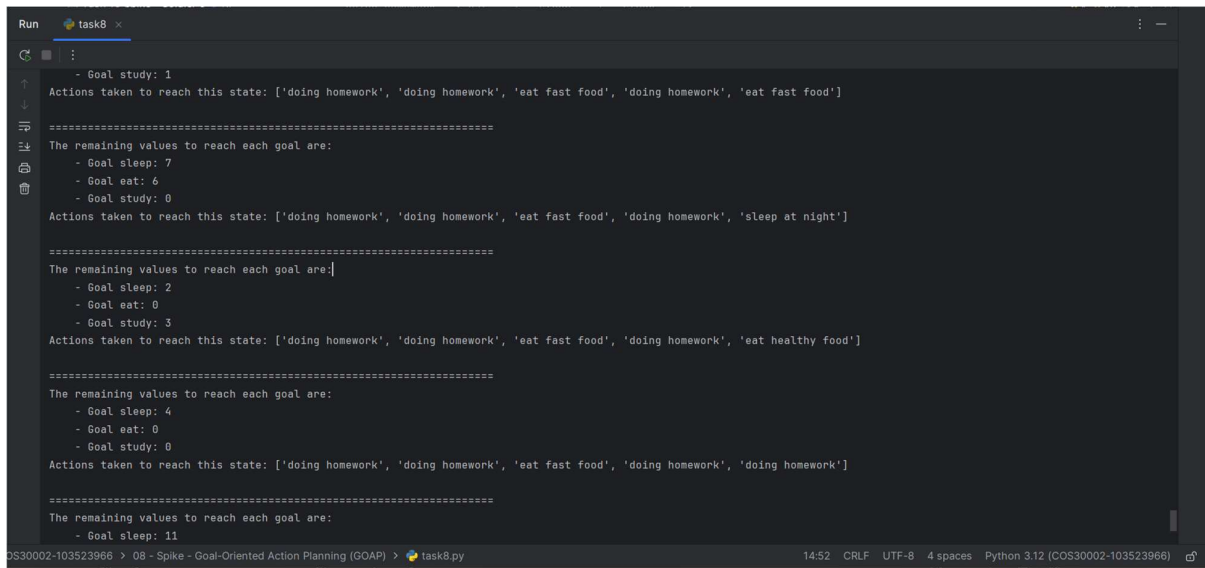
- Pycharm
- ChatGPT
- VSCode

Tasks undertaken:

- From task 7, copy code for goals and actions
- Define a class named Graph, and initialise it with goals and action which have been modified to be more complex
- Introduce a Node class to represent all the states in the search, it consists of current node, parent node and list of actions that led to the current node
- Create a method named goalsAreReached to check if all the goals has reached the target value of 0
- Create a method named getChild to apply an action to the current state
- Create a method named printNode to output the current state, also the path taken to reach that state
- Create a method called searchBFS outside of the class
- In the method, visitedStates was used to keep track of visited states. If all objectives are met or the number of nodes needed to be investigated gets to 0, keep searching.

What we found out:

The program runs as expected



```
Run task8 x
- Goal study: 1
Actions taken to reach this state: ['doing homework', 'doing homework', 'eat fast food', 'doing homework', 'eat fast food']
=====
The remaining values to reach each goal are:
- Goal sleep: 7
- Goal eat: 6
- Goal study: 0
Actions taken to reach this state: ['doing homework', 'doing homework', 'eat fast food', 'doing homework', 'sleep at night']
=====
The remaining values to reach each goal are:
- Goal sleep: 2
- Goal eat: 0
- Goal study: 3
Actions taken to reach this state: ['doing homework', 'doing homework', 'eat fast food', 'doing homework', 'eat healthy food']
=====
The remaining values to reach each goal are:
- Goal sleep: 4
- Goal eat: 0
- Goal study: 0
Actions taken to reach this state: ['doing homework', 'doing homework', 'eat fast food', 'doing homework', 'doing homework']
=====
The remaining values to reach each goal are:
- Goal sleep: 11
```

Open issues/risks [Optional – **remove** heading/section if not used!]:

List out the issues and risks that you have been unable to resolve at the end of the spike. You may have uncovered a whole range of new risks as well.

- eg. Risk xyz (new)

Recommendations [Optional – **remove** heading/section if not used!]:

Often based on any open issues/risks identified. You may state that another spike is required to resolve new issues identified (or) indicate that this spike has increased your confidence in XYZ and should move on.