Python 3.8.3 (default, Jul 2 2020, 17:30:36) [MSC v.1916 64 bit (AMD64)]
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IPython 7.16.1 -- An enhanced Interactive Python.

Restarting kernel...

In [1]:   'C:/Technical/MSc/Semester1/Mandatory/Knowledge Representation/
GIT/aima-python/Assignment1/A1_COMP9016_PENDSE_SHANKAR_R00195877.py'   ='C:/
Technical/MSc/Semester1/Mandatory/Knowledge Representation/GIT/aima-python/
Assignment1'

Demonstrating working of Different types of Agents (SimpleReflex, ModelBased and
GoalBased):

DEMONSTRATING A SIMPLE REFLEX AGENT

Run: 0: Agent current location: [0, 0]
    Remaining fuel is: 100
    AutonomousDriver decided to moveahead at location: [0, 0]
    AutonomousDriver decided to moveahead and current location is: [1, 0]

Run: 1: Agent current location: [1, 0]
    Remaining fuel is: 95
    AutonomousDriver decided to moveahead at location: [1, 0]
    AutonomousDriver decided to moveahead and current location is: [2, 0]

Run: 2: Agent current location: [2, 0]
    Remaining fuel is: 90
    AutonomousDriver decided to moveahead at location: [2, 0]
    AutonomousDriver decided to moveahead and current location is: [3, 0]

Run: 3: Agent current location: [3, 0]
    Remaining fuel is: 85
    AutonomousDriver decided to moveahead at location: [3, 0]
    AutonomousDriver decided to moveahead and current location is: [4, 0]

Run: 4: Agent current location: [4, 0]
    Remaining fuel is: 80
    AutonomousDriver decided to moveahead at location: [4, 0]
    AutonomousDriver decided to moveahead and current location is: [5, 0]

Run: 5: Agent current location: [5, 0]
    Remaining fuel is: 75
    AutonomousDriver decided to wait for 1 seconds due to traffic signal
    AutonomousDriver did wait for 1 seconds due to traffic signal

Run: 6: Agent current location: [6, 0]
    Remaining fuel is: 70

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        AutonomousDriver decided to moveahead at location: [6, 0]
        AutonomousDriver decided to moveahead and current location is: [7, 0]

Run: 7: Agent current location: [7, 0]
        Remaining fuel is:  65
        AutonomousDriver decided to moveahead at location: [7, 0]
        AutonomousDriver decided to moveahead and current location is: [8, 0]

Run: 8: Agent current location: [8, 0]
        Remaining fuel is:  60
        AutonomousDriver decided to turnright at location: [8, 0]
        AutonomousDriver turned right and current location is: [8, 1]

Run: 9: Agent current location: [8, 1]
        Remaining fuel is:  55
        AutonomousDriver decided to moveahead at location: [8, 1]
        AutonomousDriver decided to moveahead and current location is: [8, 2]

Run: 10: Agent current location: [8, 2]
        Remaining fuel is:  50
        AutonomousDriver decided to moveahead at location: [8, 2]
        AutonomousDriver decided to moveahead and current location is: [8, 3]

Run: 11: Agent current location: [8, 3]
        Remaining fuel is:  45
        AutonomousDriver decided to moveahead at location: [8, 3]
        AutonomousDriver decided to moveahead and current location is: [8, 4]

Run: 12: Agent current location: [8, 4]
        Remaining fuel is:  40
        AutonomousDriver decided to moveahead at location: [8, 4]
        AutonomousDriver decided to moveahead and current location is: [8, 5]

Run: 13: Agent current location: [8, 5]
        Remaining fuel is:  35
        AutonomousDriver decided to moveahead at location: [8, 5]
        AutonomousDriver decided to moveahead and current location is: [8, 6]

Run: 14: Agent current location: [8, 6]
        Remaining fuel is:  30
        AutonomousDriver decided to moveahead at location: [8, 6]
        AutonomousDriver decided to moveahead and current location is: [8, 7]

Run: 15: Agent current location: [8, 7]
        Remaining fuel is:  25
        AutonomousDriver decided to moveahead at location: [8, 7]
        AutonomousDriver decided to moveahead and current location is: [8, 8]

Run: 16: Agent current location: [8, 8]
        Remaining fuel is:  20
        AutonomousDriver decided to moveahead at location: [8, 8]
        AutonomousDriver decided to moveahead and current location is: [8, 9]

Run: 17: Agent current location: [8, 9]
        Remaining fuel is:  15
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        AutonomousDriver decided to moveahead at location: [8, 9]
        AutonomousDriver decided to moveahead and current location is: [8, 10]

Run: 18: Agent current location: [8, 10]
        Remaining fuel is:   10
        AutonomousDriver decided to moveahead at location: [8, 10]
        AutonomousDriver decided to moveahead and current location is: [8, 11]

Run: 19: Agent current location: [8, 11]
        Remaining fuel is:   5
        AutonomousDriver decided to moveahead at location: [8, 11]
        AutonomousDriver decided to moveahead and current location is: [8, 12]
        <AutonomousDriver> has run out of fuel and has been turned off

SIMPLE REFLEX AGENT DEMONSTRATION COMPLETE
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DEMONSTRATING A GOAL BASED AGENT
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Run: 0: Agent current location: [0, 0]
        Remaining fuel is:   100
        percepts: [<AutonomousDriver>]
        AutonomousDriver decided to moveahead at location: [0, 0]
        AutonomousDriver decided to moveahead and current location is: [1, 0]

Run: 1: Agent current location: [1, 0]
        Remaining fuel is:   95
        percepts: [<AutonomousDriver>]
        AutonomousDriver decided to moveahead at location: [1, 0]
        AutonomousDriver decided to moveahead and current location is: [2, 0]

Run: 2: Agent current location: [2, 0]
        Remaining fuel is:   90
        percepts: [<AutonomousDriver>]
        AutonomousDriver decided to moveahead at location: [2, 0]
        AutonomousDriver decided to moveahead and current location is: [3, 0]

Run: 3: Agent current location: [3, 0]
        Remaining fuel is:   85
        percepts: [<AutonomousDriver>]
        AutonomousDriver decided to moveahead at location: [3, 0]
        AutonomousDriver decided to moveahead and current location is: [4, 0]

Run: 4: Agent current location: [4, 0]
        Remaining fuel is:   80
        percepts: [<AutonomousDriver>]
        AutonomousDriver decided to moveahead at location: [4, 0]
        AutonomousDriver decided to moveahead and current location is: [5, 0]

Run: 5: Agent current location: [5, 0]
        Remaining fuel is:   75
        percepts: [<AutonomousDriver>, <TrafficSignal>]
        AutonomousDriver decided to moveahead at location: [5, 0]
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AutonomousDriver decided to moveahead and current location is: [6, 0]

    Run: 6: Agent current location: [6, 0]
        Remaining fuel is: 70
        percepts: [<AutonomousDriver>]
        AutonomousDriver decided to turnright at location: [6, 0]
        AutonomousDriver turned right and current location is: [6, 1]

    Run: 7: Agent current location: [6, 1]
        Remaining fuel is: 65
        percepts: [<AutonomousDriver>, <TurnRightSignBoard>]
        AutonomousDriver decided to turnright at location: [6, 1]
        AutonomousDriver turned right and current location is: [6, 2]

    Run: 8: Agent current location: [6, 2]
        Remaining fuel is: 60
        percepts: [<AutonomousDriver>]
        AutonomousDriver decided to turnright at location: [6, 2]
        AutonomousDriver turned right and current location is: [6, 3]

    Run: 9: Agent current location: [6, 3]
        Remaining fuel is: 55
        percepts: [<AutonomousDriver>]
        AutonomousDriver decided to turnright at location: [6, 3]
        AutonomousDriver turned right and current location is: [6, 4]

    Run: 10: Agent current location: [6, 4]
        Remaining fuel is: 50
        percepts: [<AutonomousDriver>]
        AutonomousDriver decided to turnright at location: [6, 4]
        AutonomousDriver turned right and current location is: [6, 5]

    Run: 11: Agent current location: [6, 5]
        Remaining fuel is: 45
        percepts: [<AutonomousDriver>]
        AutonomousDriver decided to turnright at location: [6, 5]
        AutonomousDriver turned right and current location is: [6, 6]
        agent reached its goal which is at [6, 6] and current location of agent is:
[6 6]

GOAL BASED AGENT DEMONSTRATION COMPLETE
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DEMONSTRATING A MODEL BASED AGENT
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Run: 0: Agent current location: [0, 0]
        Remaining fuel is: 100
        model: {}
        percepts: [<AutonomousDriver>]
        AutonomousDriver decided to moveahead at location: [0, 0]
        AutonomousDriver decided to moveahead and current location is: [1, 0]

Run: 1: Agent current location: [1, 0]

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    Remaining fuel is:  95
    model:  {}
    percepts: [<AutonomousDriver>]
    AutonomousDriver decided to moveahead at location: [1, 0]
    AutonomousDriver decided to moveahead and current location is: [2, 0]

Run: 2: Agent current location: [2, 0]
    Remaining fuel is:  90
    model:  {}
    percepts: [<AutonomousDriver>]
    AutonomousDriver decided to moveahead at location: [2, 0]
    AutonomousDriver decided to moveahead and current location is: [3, 0]

Run: 3: Agent current location: [3, 0]
    Remaining fuel is:  85
    model:  {}
    percepts: [<AutonomousDriver>]
    AutonomousDriver decided to moveahead at location: [3, 0]
    AutonomousDriver decided to moveahead and current location is: [4, 0]

Run: 4: Agent current location: [4, 0]
    Remaining fuel is:  80
    model:  {}
    percepts: [<AutonomousDriver>]
    AutonomousDriver decided to moveahead at location: [4, 0]
    AutonomousDriver decided to moveahead and current location is: [5, 0]

Run: 5: Agent current location: [5, 0]
    Remaining fuel is:  75
    model:  {}
    percepts: [<AutonomousDriver>, <TrafficSignal>]
    AutonomousDriver decided to wait for 1 seconds due to traffic signal
    AutonomousDriver did wait for 1 seconds due to traffic signal

Run: 6: Agent current location: [6, 0]
    Remaining fuel is:  70
    model:  {'<TrafficSignal>': 'wait'}
    percepts: [<AutonomousDriver>]
    AutonomousDriver decided to moveahead at location: [6, 0]
    AutonomousDriver decided to moveahead and current location is: [7, 0]

Run: 7: Agent current location: [7, 0]
    Remaining fuel is:  65
    model:  {'<TrafficSignal>': 'wait'}
    percepts: [<AutonomousDriver>]
    AutonomousDriver decided to moveahead at location: [7, 0]
    AutonomousDriver decided to moveahead and current location is: [8, 0]

Run: 8: Agent current location: [8, 0]
    Remaining fuel is:  60
    model:  {'<TrafficSignal>': 'wait'}
    percepts: [<AutonomousDriver>, <TurnRightSignBoard>]
    AutonomousDriver decided to turnright at location: [8, 0]
    AutonomousDriver turned right and current location is: [8, 1]
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Run: 9: Agent current location: [8, 1]
    Remaining fuel is:  55
    model:  {'<TrafficSignal>': 'wait', '<TurnRightSignBoard>': 'turnright'}
    percepts: [<AutonomousDriver>]
    AutonomousDriver decided to moveahead at location: [8, 1]
    AutonomousDriver decided to moveahead and current location is: [8, 2]

Run: 10: Agent current location: [8, 2]
    Remaining fuel is:  50
    model:  {'<TrafficSignal>': 'wait', '<TurnRightSignBoard>': 'turnright'}
    percepts: [<AutonomousDriver>]
    AutonomousDriver decided to moveahead at location: [8, 2]
    AutonomousDriver decided to moveahead and current location is: [8, 3]

Run: 11: Agent current location: [8, 3]
    Remaining fuel is:  45
    model:  {'<TrafficSignal>': 'wait', '<TurnRightSignBoard>': 'turnright'}
    percepts: [<AutonomousDriver>]
    AutonomousDriver decided to moveahead at location: [8, 3]
    AutonomousDriver decided to moveahead and current location is: [8, 4]

Run: 12: Agent current location: [8, 4]
    Remaining fuel is:  40
    model:  {'<TrafficSignal>': 'wait', '<TurnRightSignBoard>': 'turnright'}
    percepts: [<AutonomousDriver>, <TurnRightSignBoard>]
    percept matched:  <TurnRightSignBoard>
    returning action:  turnright
    AutonomousDriver decided to turnright at location: [8, 4]
    AutonomousDriver turned right and current location is: [7, 4]

Run: 13: Agent current location: [7, 4]
    Remaining fuel is:  40
    model:  {'<TrafficSignal>': 'wait', '<TurnRightSignBoard>': 'turnright'}
    percepts: [<AutonomousDriver>]
    AutonomousDriver decided to move down at location [7, 4]
    AutonomousDriver moved down and current location is: [6, 4]

Run: 14: Agent current location: [6, 4]
    Remaining fuel is:  40
    model:  {'<TrafficSignal>': 'wait', '<TurnRightSignBoard>': 'turnright'}
    percepts: [<AutonomousDriver>, <TurnLeftSignBoard>]
    AutonomousDriver decided to turnleft at location: [6, 4]
    AutonomousDriver turned left and current location is: [6, 5]

Run: 15: Agent current location: [6, 5]
    Remaining fuel is:  35
    model:  {'<TrafficSignal>': 'wait', '<TurnRightSignBoard>': 'turnright',
'<TurnLeftSignBoard>': 'turnleft'}
    percepts: [<AutonomousDriver>]
    AutonomousDriver decided to moveahead at location: [6, 5]
    AutonomousDriver decided to moveahead and current location is: [6, 6]
    agent reached its goal which is at [6, 6] and current location of agent is:
[6 6]

MODLE BASED AGENT DEMONSTRATION COMPLETE
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Demonstrating different search techniques (Uninformed and Informed Searches):


Run: 0: Agent current location: [0, 0]
    Remaining fuel is:  100
    model:  {}
    percepts: [<AutonomousDriver>]
    Running Breadth First Tree Search technique
    Breadth First Tree Search technique completed
    Solution obtained from BFTStechnique is: ['Block1', 'Block4', 'home']
    Path cost of BFTS is: 10.5
    Agent reached its goal which is at location [6, 6] after implementing the
BFTS technique
    Remaining fuel with Agent is:  40

Run: 0: Agent current location: [0, 0]
    Remaining fuel is:  100
    model:  {}
    percepts: [<AutonomousDriver>]
    Running Depth First Graph Search technique
    Depth First Graph Search technique completed
    Solution obtained from DFGStechnique is: ['Block3', 'Block9', 'theatre',
'home']
    Path cost of DFGS is: 16.5
    Agent reached its goal which is at location [6, 6] after implementing the
DFGS technique
    Remaining fuel with Agent is:  20

Run: 0: Agent current location: [0, 0]
    Remaining fuel is:  100
    model:  {}
    percepts: [<AutonomousDriver>]
    Running Uniform Cost Search technique
    Uniform Cost Search technique is complete
    Solution obtained from UCStechnique is: ['Block2', 'Block6', 'Block11',
'home']
    Path cost of UCS is: 6.5
    Agent reached its goal which is at location [6, 6] after implementing the UCS
technique
    Remaining fuel with Agent is:  25

Run: 0: Agent current location: [0, 0]
    Remaining fuel is:  100
    model:  {}
    percepts: [<AutonomousDriver>]
    Running Best First Graph Search technique
    Best First Graph Search technique complete
    Solution obtained from BFGStechnique is: ['Block1', 'Block4', 'home']
    Path cost of BFGS is: 10.5
    Agent reached its goal which is at location [6, 6] after implementing the
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BFGS technique
    Remaining fuel with Agent is:  40

Run: 0: Agent current location: [0, 0]
    Remaining fuel is:  100
    model:  {}
    percepts: [<AutonomousDriver>]
    Running A* Search technique
    A* Search complete
    Solution obtained from ASTStechnique is: ['Block2', 'Block6', 'Block11',
'home']
    Path cost of ASTS is: 6.5
    Agent reached its goal which is at location [6, 6] after implementing the
ASTS technique
    Remaining fuel with Agent is:  25

Run: 0: Agent current location: [0, 0]
    Remaining fuel is:  100
    model:  {}
    percepts: [<AutonomousDriver>]
    Running Recursive Best First Search technique
    Recursive Best First Search technique complete
    Solution obtained from RBFStechnique is: ['Block2', 'Block6', 'Block10',
'home']
    Path cost of RBFS is: 8.0
    Agent reached its goal which is at location [6, 6] after implementing the
RBFS technique
    Remaining fuel with Agent is:  25
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In [2]: