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Intro to IS: Homework 1

1. I believe AI will probably procrastinate if it is created in the image of a human mind. The article states that it won't due to being "billions of times more powerful than human intelligence", but I don't see how this would eliminate human behavior from the AI, only speed up the process of procrastinating and then completing tasks. Or perhaps the ai would procrastinate even longer, knowing that it can complete a task more quickly than a human would, and therefore can finish up closer to the deadline. If the AI is not made in the image of a human mind however, but is made for efficiency, then of course we would ensure that it could not waste time intentionally.

2. A. false. The given example in the chapter about being flattened by a falling object when crossing an empty street shows this.
   D. true. The agent function maps a sequence of percepts to an actual action, while the agent program is the software that accepts the received percepts and decides upon an action to take.

3.

Agent	Performance measure	Environment	Actuators	Sensors
Myself, scheduling next semester	12 credit hours, no overlapping times, fulfill course requirements	SIS, courses	Keyboard, mouse	Computer monitor
Human soccer player	Teamwork, safety, scoring, preventing enemy scoring	Soccer field, players, ball	Legs, arms, voice	The 5 human senses
Tiny soccer robot	Teamwork, safety, scoring, preventing enemy scoring	Tiny field, tiny ball, other robots	Wheels, kicking mechanism	Field camera, radio receiver

4. A. a binary tree with leaf nodes holding numbers and parent nodes holding operators
   B. a root node containing one of the numbers
   C. 1. replace a leaf node(number) with a node containing an operation which has 2 leaf nodes, one holding the replaced number and one from the pool of unused numbers.
   2. If the tree only has a root node, swap the number for an unused number

D. the branching factor is 36, when 3 numbers are already in the tree. Each leaf can expand into an operator(4 choices) with any of the remaining 3 numbers. 3*4*3 = 36
E. the maximum search depth is 6. One move to swap the root at the start if necessary, and 5 to add the other numbers into the equation
F. no, this way of handling the problem finds answers and then compares to the goal, and therefore can just run longer to find more answers

5.
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D:\Documents\school\introToAI>python assign1.py cold warm exampleWords.txt
['cold', 'cord', 'word', 'ward', 'warm']

D:\Documents\school\introToAI>python assign1.py small short exampleWords.txt
['small', 'shall', 'shalt', 'shaft', 'shift', 'shirt', 'short']

D:\Documents\school\introToAI>python assign1.py back hill exampleWords.txt
['back', 'balk', 'bilk', 'bill', 'hill']
```

6. f(node) = g(node) + h(node)
   f(Fagaras) = 210 + 176 = 386 -- chosen step3
   f(Sibiu) = 309 + 253 = 562
   f(Bucharest) = 421 + 0 = 421
   f(Iasai) = 87 + 226 = 313 -- chosen step1
   f(Vaslui) = 179 + 199 = 378 -- chosen step2
   f(Urziceni) = 321 + 80 = 401 -- chose step4
   f(Bucharest) = 406 + 0 -- complete
   f(Hirsova) = 419 + 570