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CSE 4309-001
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Task 1.

value_iteration('environment2.txt', -0.04, 1, 20):

utilities:

```
 0.812  0.868  0.918  1.000
 0.762  0.000  0.660 -1.000
 0.705  0.655  0.611  0.387
```

policy:

```
>    >    >    o
^    x    ^    o
^    <    <    <
```

value_iteration('environment2.txt', -0.04, 0.9, 20):

utilities:

```
 0.509   0.650   0.795   1.000
 0.399   0.000   0.486  -1.000
 0.296   0.254   0.345   0.130
```

policy:

```
>    >    >    o
^    x    ^    o
^    >    ^    <
```

Task 2.

- The reward for the non-terminal states would be -0.01. Since chess is usually a long game, having a close to 0 reward for non-terminal states allows for the longer sequences of a chess match to be less costly
- The discount factor gamma would be 1. A discount factor of 1 means that the agent prefers future rewards over immediate rewards, an ideal strategy for a game such as chess.

Task 3.

A. U(2,2) for Up = 0.86
B. (-0.05, 0.05)