Subtask2:

	1	2	3	4	5
1	6.52	6.80	7.08	7.33	7.58
2	6.30	6.52			7.86
3	6.02	5.82	-5.00	-5.00	8.11
4	5.74	5.46	4.30	6.30	10.00
5	5.46	5.24		-10.00	7.56

Fig: Grid world problem.

This is a grid world problem.

So, there are three green states.

Detailed Analysis for Highlighted States:

1. **For state at (2,1) with utility 6.30:**
    - **Possible Actions:** Move Up, Down and Move Right.
    - **Optimal Action Calculation:**
        - Moving to (1,1) with a utility of 6.52 with a direct reward of -0.2
        - Utility for moving up:-0.2+.8x6.52+.1(6.30+6.52)=6.698
        - Utility for Moving down: -0.2+.8x6.02+.1(6.30+6.52)=5.898
        - Utility for moving left: -0.2+.8x6.52+.1(6.52+6.02)=6.27

	1	2	3	4	5
1	6.52	6.80	7.08	7.33	7.58
2	6.30 ↑	6.52			7.86
3	6.02	5.82	-5.00	-5.00	8.11
4	5.74	5.46	4.30	6.30	10.00
5	5.46	5.24		-10.00	7.56

So, the calculation suggests that moving **UP** is an optimal strategy for the state (2,1).

2. **For state at (3,2) with utility 5.82:**
    - **Possible Actions:** Move Up, Down and Right and Left.
    - **Optimal Action Calculation:**
        - Moving to (2,2),(3,1),(3,3) or (4,2) with a utility and direct reward of -0.2
        - Utility for moving up:-0.2+.8x6.52+.1(6.02-5.00)=5.118
        - Utility for Moving left: -0.2+.8x6.02+.1(5.46+6.52)=5.814
        - Utility for moving down: -0.2+.8x5.46+.1(-5.00+6.02)=4.27
        - Utility for moving right: Terminal area on the left. So, this should not be an option

	1	2	3	4	5
1	6.52	6.80	7.08	7.33	7.58
2	6.30	6.52			7.86
3	6.02	5.82	-5.00	-5.00	8.11
4	5.74	5.46	4.30	6.30	10.00
5	5.46	5.24		-10.00	7.56

So, the calculation suggests that moving **LEFT** is an optimal strategy for the state (3,2).

3. **For state at (1,4) with utility 7.33:**
    - **Possible Actions:** Move Right and left.
    - **Optimal Action Calculation:**
        - Moving to (1,3),(1,5) with a utility and direct reward of -0.2
        - Utility for moving right:-0.2+.8x7.58+.1(7.33+7.33)=7.33
        - Utility for Moving left: -0.2+.8x7.08+.1(7.33+7.33)=6.93
        - Utility for moving Up and down: Inaccessible area

	1	2	3	4	5
1	6.52	6.80	7.08	7.33	7.58
2	6.30	6.52			7.86
3	6.02	5.82	-5.00	-5.00	8.11
4	5.74	5.46	4.30	6.30	10.00
5	5.46	5.24		-10.00	7.56

So, the calculation suggests that moving **RIGHT** is an optimal strategy for the state (1,4).

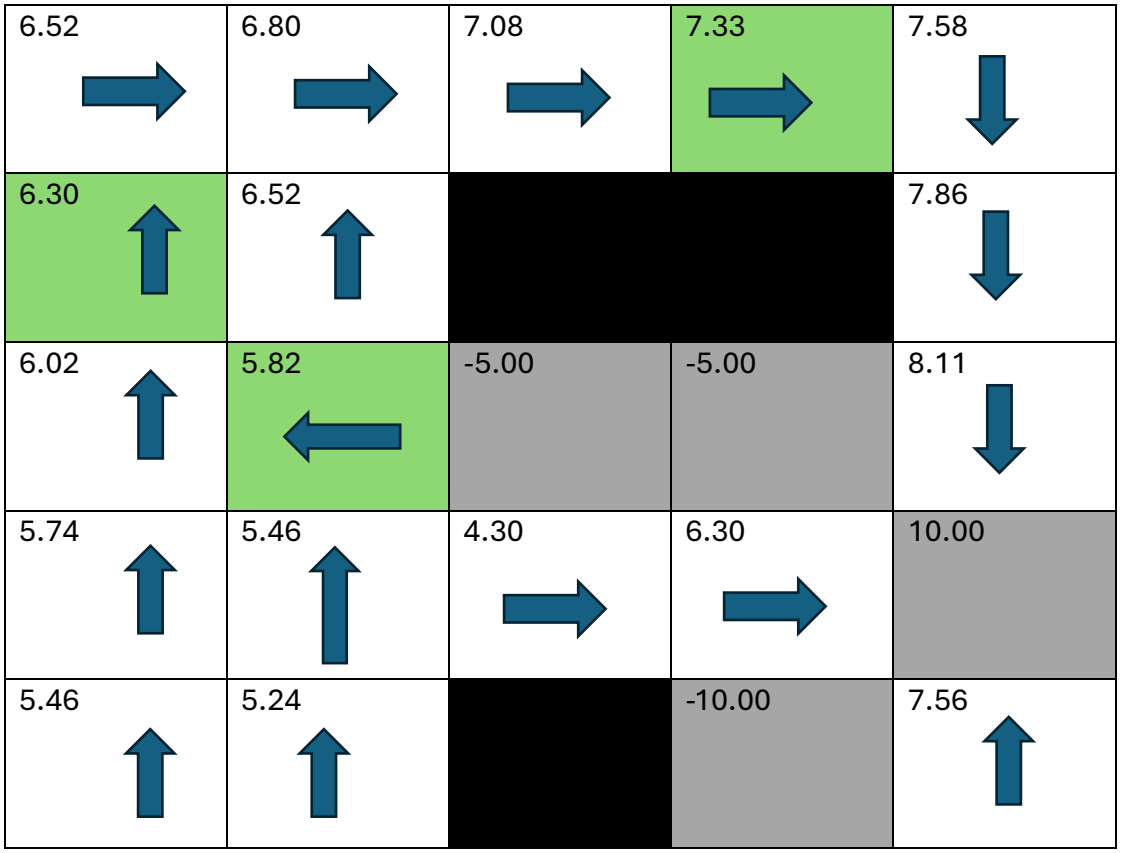

Fig: Optimal policy for Agent with direction.

Conclusion:

The policy for each green highlighted area appears to shift to adjacent states with higher utilities, taking into account both direct and perpendicular movement probabilities. For instance, in the case of the green state of (3,2), it chooses to go right despite having a higher utility for going up. This is because going up entails a higher risk of falling into the lower terminal area. Other states adjacent to it follow the policy of choosing the higher utility option.