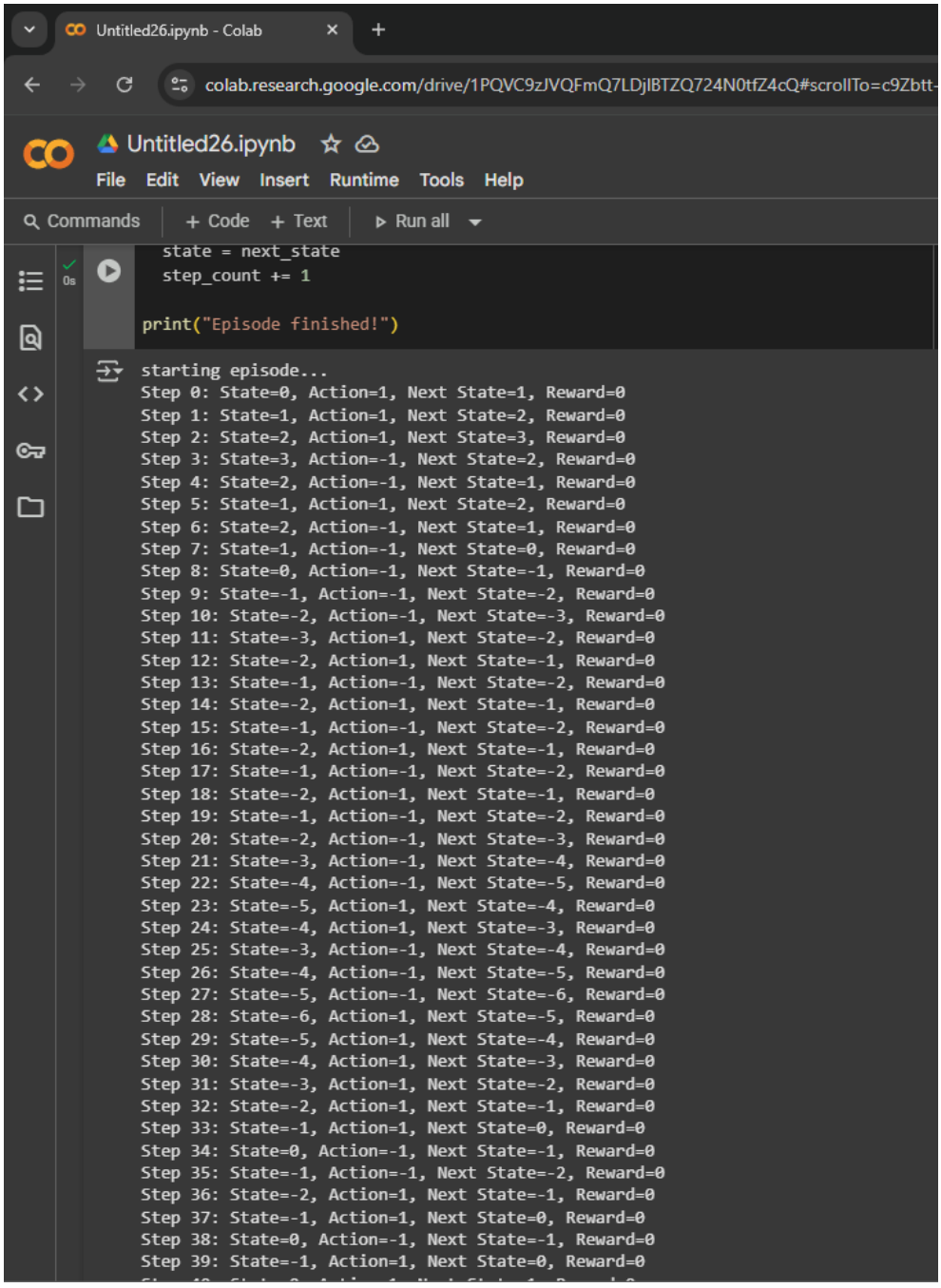
1a)


Untitled26.ipynb - Colab
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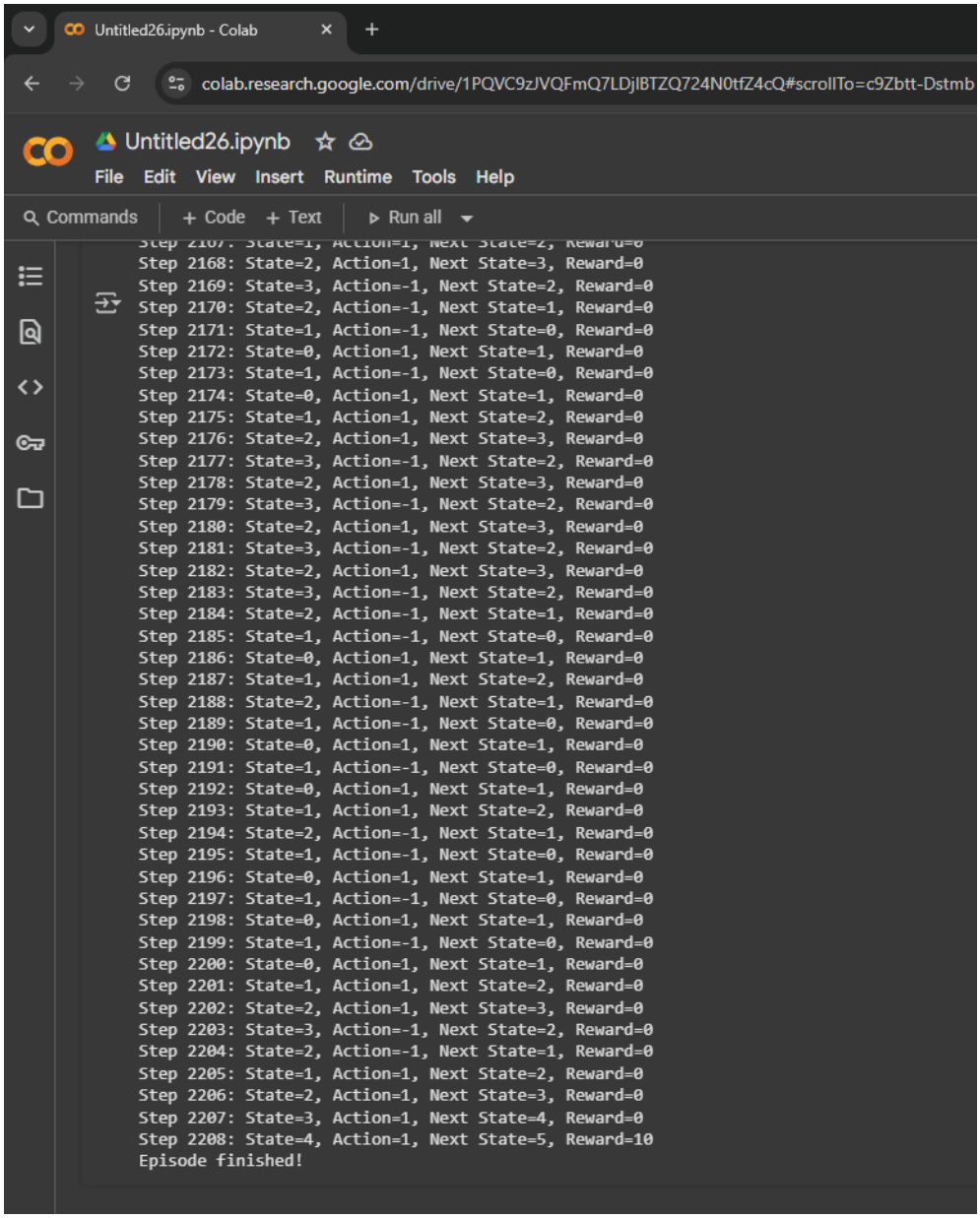
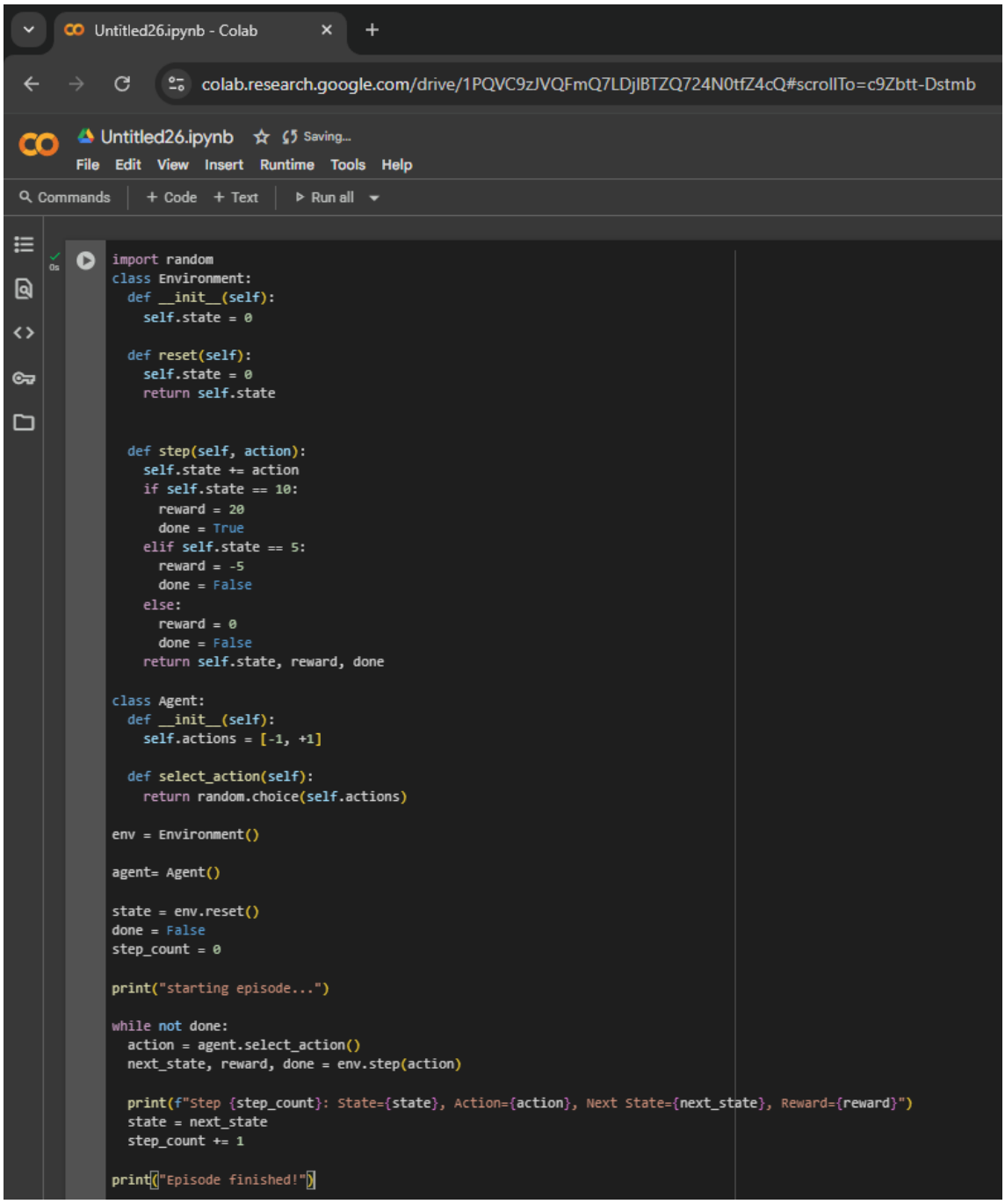
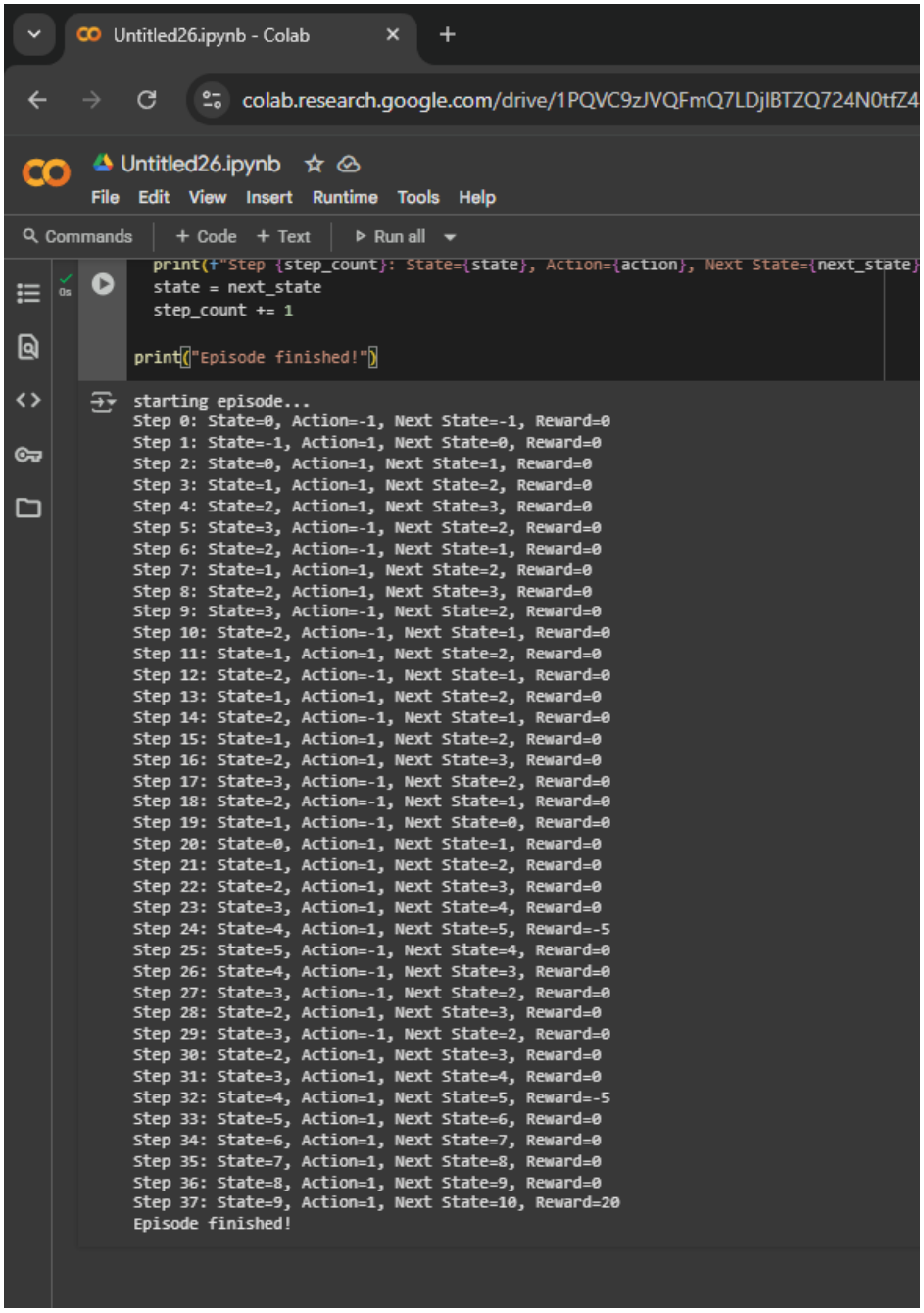
Untitled26.ipynb
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
state = next_state
step_count += 1
print("Episode finished!")
starting episode...
Step 0: State=0, Action=1, Next State=1, Reward=0
Step 1: State=1, Action=1, Next State=2, Reward=0
Step 2: State=2, Action=1, Next State=3, Reward=0
Step 3: State=3, Action=-1, Next State=2, Reward=0
Step 4: State=2, Action=-1, Next State=1, Reward=0
Step 5: State=1, Action=1, Next State=2, Reward=0
Step 6: State=2, Action=-1, Next State=1, Reward=0
Step 7: State=1, Action=-1, Next State=0, Reward=0
Step 8: State=0, Action=-1, Next State=-1, Reward=0
Step 9: State=-1, Action=-1, Next State=-2, Reward=0
Step 10: State=-2, Action=-1, Next State=-3, Reward=0
Step 11: State=-3, Action=1, Next State=-2, Reward=0
Step 12: State=-2, Action=1, Next State=-1, Reward=0
Step 13: State=-1, Action=-1, Next State=-2, Reward=0
Step 14: State=-2, Action=1, Next State=-1, Reward=0
Step 15: State=-1, Action=-1, Next State=-2, Reward=0
Step 16: State=-2, Action=1, Next State=-1, Reward=0
Step 17: State=-1, Action=-1, Next State=-2, Reward=0
Step 18: State=-2, Action=1, Next State=-1, Reward=0
Step 19: State=-1, Action=-1, Next State=-2, Reward=0
Step 20: State=-2, Action=-1, Next State=-3, Reward=0
Step 21: State=-3, Action=-1, Next State=-4, Reward=0
Step 22: State=-4, Action=-1, Next State=-5, Reward=0
Step 23: State=-5, Action=1, Next State=-4, Reward=0
Step 24: State=-4, Action=1, Next State=-3, Reward=0
Step 25: State=-3, Action=-1, Next State=-4, Reward=0
Step 26: State=-4, Action=-1, Next State=-5, Reward=0
Step 27: State=-5, Action=-1, Next State=-6, Reward=0
Step 28: State=-6, Action=1, Next State=-5, Reward=0
Step 29: State=-5, Action=1, Next State=-4, Reward=0
Step 30: State=-4, Action=1, Next State=-3, Reward=0
Step 31: State=-3, Action=1, Next State=-2, Reward=0
Step 32: State=-2, Action=1, Next State=-1, Reward=0
Step 33: State=-1, Action=1, Next State=0, Reward=0
Step 34: State=0, Action=-1, Next State=-1, Reward=0
Step 35: State=-1, Action=-1, Next State=-2, Reward=0
Step 36: State=-2, Action=1, Next State=-1, Reward=0
Step 37: State=-1, Action=1, Next State=0, Reward=0
Step 38: State=0, Action=-1, Next State=-1, Reward=0
Step 39: State=-1, Action=1, Next State=0, Reward=0


Untitled26.ipynb - Colab
colab.research.google.com/drive/1PQVC9zJVQFmQ7LDjlBTZQ724N0tfZ4cQ#scrollTo=c9Zbtt-Dstmb
Untitled26.ipynb
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
Step 2168: State=2, Action=1, Next State=3, Reward=0
Step 2169: State=3, Action=-1, Next State=2, Reward=0
Step 2170: State=2, Action=-1, Next State=1, Reward=0
Step 2171: State=1, Action=-1, Next State=0, Reward=0
Step 2172: State=0, Action=1, Next State=1, Reward=0
Step 2173: State=1, Action=-1, Next State=0, Reward=0
Step 2174: State=0, Action=1, Next State=1, Reward=0
Step 2175: State=1, Action=1, Next State=2, Reward=0
Step 2176: State=2, Action=1, Next State=3, Reward=0
Step 2177: State=3, Action=-1, Next State=2, Reward=0
Step 2178: State=2, Action=1, Next State=3, Reward=0
Step 2179: State=3, Action=-1, Next State=2, Reward=0
Step 2180: State=2, Action=1, Next State=3, Reward=0
Step 2181: State=3, Action=-1, Next State=2, Reward=0
Step 2182: State=2, Action=1, Next State=3, Reward=0
Step 2183: State=3, Action=-1, Next State=2, Reward=0
Step 2184: State=2, Action=-1, Next State=1, Reward=0
Step 2185: State=1, Action=-1, Next State=0, Reward=0
Step 2186: State=0, Action=1, Next State=1, Reward=0
Step 2187: State=1, Action=1, Next State=2, Reward=0
Step 2188: State=2, Action=-1, Next State=1, Reward=0
Step 2189: State=1, Action=-1, Next State=0, Reward=0
Step 2190: State=0, Action=1, Next State=1, Reward=0
Step 2191: State=1, Action=-1, Next State=0, Reward=0
Step 2192: State=0, Action=1, Next State=1, Reward=0
Step 2193: State=1, Action=1, Next State=2, Reward=0
Step 2194: State=2, Action=-1, Next State=1, Reward=0
Step 2195: State=1, Action=-1, Next State=0, Reward=0
Step 2196: State=0, Action=1, Next State=1, Reward=0
Step 2197: State=1, Action=-1, Next State=0, Reward=0
Step 2198: State=0, Action=1, Next State=1, Reward=0
Step 2199: State=1, Action=-1, Next State=0, Reward=0
Step 2200: State=0, Action=1, Next State=1, Reward=0
Step 2201: State=1, Action=1, Next State=2, Reward=0
Step 2202: State=2, Action=1, Next State=3, Reward=0
Step 2203: State=3, Action=-1, Next State=2, Reward=0
Step 2204: State=2, Action=-1, Next State=1, Reward=0
Step 2205: State=1, Action=1, Next State=2, Reward=0
Step 2206: State=2, Action=1, Next State=3, Reward=0
Step 2207: State=3, Action=1, Next State=4, Reward=0
Step 2208: State=4, Action=1, Next State=5, Reward=10
Episode finished!

1 b)


Untitled26.ipynb - Colab
colab.research.google.com/drive/1PQVC9zJVQFmQ7LDjlBTZQ724N0tfZ4cQ#scrollTo=c9Zbtt-Dstmb
Untitled26.ipynb
Saving...
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
0s
import random
class Environment:
def __init__(self):
self.state = 0
def reset(self):
self.state = 0
return self.state
def step(self, action):
self.state += action
if self.state == 10:
reward = 20
done = True
elif self.state == 5:
reward = -5
done = False
else:
reward = 0
done = False
return self.state, reward, done
class Agent:
def __init__(self):
self.actions = [-1, +1]
def select_action(self):
return random.choice(self.actions)
env = Environment()
agent= Agent()
state = env.reset()
done = False
step_count = 0
print("starting episode...")
while not done:
action = agent.select_action()
next_state, reward, done = env.step(action)
print(f"Step {step_count}: State={state}, Action={action}, Next State={next_state}, Reward={reward}")
state = next_state
step_count += 1
print("Episode finished!")


Untitled26.ipynb - Colab
colab.research.google.com/drive/1PQVC9zJVQFmQ7LDjlBTZQ724N0tfZ4
Untitled26.ipynb
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
print(f"Step {step_count}: State={state}, Action={action}, Next State={next_state}
state = next_state
step_count += 1
print("Episode finished!")
starting episode...
Step 0: State=0, Action=-1, Next State=-1, Reward=0
Step 1: State=-1, Action=1, Next State=0, Reward=0
Step 2: State=0, Action=1, Next State=1, Reward=0
Step 3: State=1, Action=1, Next State=2, Reward=0
Step 4: State=2, Action=1, Next State=3, Reward=0
Step 5: State=3, Action=-1, Next State=2, Reward=0
Step 6: State=2, Action=-1, Next State=1, Reward=0
Step 7: State=1, Action=1, Next State=2, Reward=0
Step 8: State=2, Action=1, Next State=3, Reward=0
Step 9: State=3, Action=-1, Next State=2, Reward=0
Step 10: State=2, Action=-1, Next State=1, Reward=0
Step 11: State=1, Action=1, Next State=2, Reward=0
Step 12: State=2, Action=-1, Next State=1, Reward=0
Step 13: State=1, Action=1, Next State=2, Reward=0
Step 14: State=2, Action=-1, Next State=1, Reward=0
Step 15: State=1, Action=1, Next State=2, Reward=0
Step 16: State=2, Action=1, Next State=3, Reward=0
Step 17: State=3, Action=-1, Next State=2, Reward=0
Step 18: State=2, Action=-1, Next State=1, Reward=0
Step 19: State=1, Action=-1, Next State=0, Reward=0
Step 20: State=0, Action=1, Next State=1, Reward=0
Step 21: State=1, Action=1, Next State=2, Reward=0
Step 22: State=2, Action=1, Next State=3, Reward=0
Step 23: State=3, Action=1, Next State=4, Reward=0
Step 24: State=4, Action=1, Next State=5, Reward=-5
Step 25: State=5, Action=-1, Next State=4, Reward=0
Step 26: State=4, Action=-1, Next State=3, Reward=0
Step 27: State=3, Action=-1, Next State=2, Reward=0
Step 28: State=2, Action=1, Next State=3, Reward=0
Step 29: State=3, Action=-1, Next State=2, Reward=0
Step 30: State=2, Action=1, Next State=3, Reward=0
Step 31: State=3, Action=1, Next State=4, Reward=0
Step 32: State=4, Action=1, Next State=5, Reward=-5
Step 33: State=5, Action=1, Next State=6, Reward=0
Step 34: State=6, Action=1, Next State=7, Reward=0
Step 35: State=7, Action=1, Next State=8, Reward=0
Step 36: State=8, Action=1, Next State=9, Reward=0
Step 37: State=9, Action=1, Next State=10, Reward=20
Episode finished!