**Experiment 2 – E0123014**

import numpy as np

import matplotlib.pyplot as plt

n\_arms = 3

true\_rewards = [0.2,0.5,0.75]

n\_steps = 100

reward\_sums = np.zeros(n\_arms)

counts = np.zeros(n\_arms)

estimated\_rewards = np.zeros(n\_arms)

reward\_history = []

cumulative\_reward = []

for arm in range(n\_arms):

reward = int(np.random.rand() < true\_rewards[arm])

reward\_sums[arm] += reward

counts[arm] += 1

estimated\_rewards[arm] = reward\_sums[arm] / counts[arm]

reward\_history.append(reward)

cumulative\_reward.append(sum(reward\_history))

for step in range(n\_arms,n\_steps):

arm = np.argmax(estimated\_rewards)

reward = int(np.random.rand() < true\_rewards[arm])

reward\_sums[arm] += reward

counts[arm] += 1

estimated\_rewards[arm] = reward\_sums[arm] / counts[arm]

reward\_history.append(reward)

cumulative\_reward.append(cumulative\_reward[-1] + reward)

print("\nFinal Results")

print("True Reward Probabilities:",true\_rewards)

print("Estimated Reward Probabilities:",np.round(estimated\_rewards))

print("Number of times each arm was selected:",counts)

print("Total Reward Earned:", int(sum(reward\_history)))

plt.figure(figsize=(12,5))

plt.plot(cumulative\_reward, label="Cumulative Reward", color='blue')

plt.xlabel("Steps")

plt.ylabel("Total Reward")

plt.title("Greedy Agent - Reward Over Time")

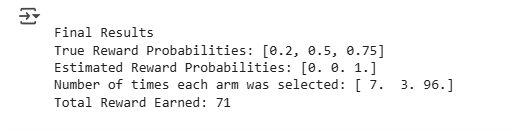
plt.grid(True)

plt.legend()

plt.tight\_layout()

plt.show()

**OUTPUT:**

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