import random

# Sabitler

population\_size = 10

num\_iterations = 50

gene\_length = 2

mutation\_rate = 0.1

# Hedef fonksiyon

def fitness\_function(strategy):

return strategy[0] + 2 \* strategy[1]

# Başlangıç popülasyonunu oluşturma

def generate\_initial\_population():

population = []

for \_ in range(population\_size):

strategy = [random.randint(0, 5) for \_ in range(gene\_length)]

population.append(strategy)

return population

# Popülasyonu değerlendirme

def evaluate\_population(population):

fitness\_scores = []

for strategy in population:

fitness\_scores.append(fitness\_function(strategy))

return fitness\_scores

# Çaprazlama

def crossover(parent1, parent2):

crossover\_point = random.randint(1, gene\_length - 1)

child1 = parent1[:crossover\_point] + parent2[crossover\_point:]

child2 = parent2[:crossover\_point] + parent1[crossover\_point:]

return child1, child2

# Mutasyon

def mutation(strategy):

for i in range(gene\_length):

if random.random() < mutation\_rate:

strategy[i] = random.randint(0, 5)

return strategy

# Başlangıç popülasyonunu oluşturma

population = generate\_initial\_population()

for iteration in range(num\_iterations):

# Popülasyonu değerlendirme

fitness\_scores = evaluate\_population(population)

# En iyi stratejiyi ve ödemesini bulma

best\_strategy = population[fitness\_scores.index(max(fitness\_scores))]

best\_payoff = max(fitness\_scores)

# En iyi stratejiyi ve ödemesini yazdırma

print(f"Iteration {iteration+1} - Best Strategy: {best\_strategy}, Best Payoff: {best\_payoff}")

# Yeni neslin oluşturulması

next\_generation = []

while len(next\_generation) < population\_size:

# Ebeveyn seçimi

parent1 = random.choice(population)

parent2 = random.choice(population)

# Çaprazlama

child1, child2 = crossover(parent1, parent2)

# Mutasyon

child1 = mutation(child1)

child2 = mutation(child2)

# Yeni nesile ekleme

next\_generation.append(child1)

next\_generation.append(child2)

# Sonraki nesilin popülasyonunu güncelleme

population = next\_generation