Computer Science dept.
California State University at Bakersfield

Preview Homework set 11

Start again

1 Marks: 1

The phenomenon where individuals are trapped in a fitness value and are unable to improve themselves is called a:

Choose one answer.

- a. Global optimum
- b. Local minima
- c. Local optimum
- d. All are correct

2 Marks: 1

Each iteration of a genetic algorithm is called a(n):

Choose one answer.

- a. Time step
- b. Generation
- c. Step
- d. Epoch

3 Marks: 1

There is a random chance that crossover will occur.

Answer:

- True
- False

4 Marks: 1

There is a random chance that mutation will occur.

Answer:

- True
- False

5 Marks: 1

_____ is based on the process of reproduction, mutation, competition and selection.

Choose one answer.

- a. Natural selection
- b. Evolution
- c. Neo-Darwinism
- d. Inheritance

6 Marks: 1

The operator which changes the gene value in some randomly chosen location is called:

Choose one answer.

- a. Crossover
- b. All are correct
- c. Selection
- d. Mutation

7

Marks: 1

The theory of natural selection was originally proposed by:

Choose one answer.

- a. Sir Barristan Selmy
- b. August Weismann
- c. Charles Darwin
- d. Gregor Mendel

8

Marks: 1

In genetic algorithms, the position of the one, correct solution is called the:

Choose one answer.

- a. Local optimum
- b. Global optimum
- c. Local minima
- d. All are correct

9

Marks: 1

Optimization is guaranteed to find the correct solution to a problem.

Answer:

- True
- False

10

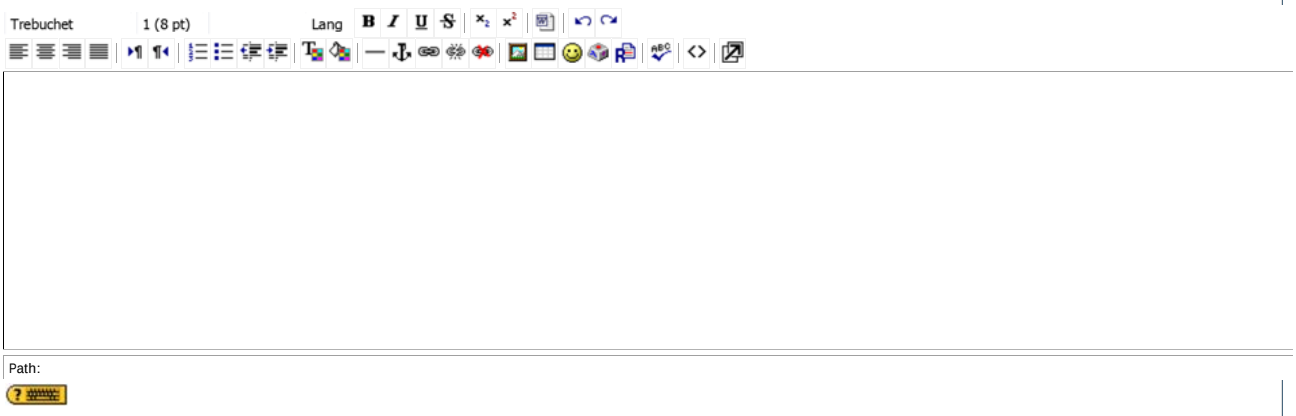
Marks: 1

Give C/C++ code that calculates the offspring of two children for a max ones simulation. The crossover should be a one-point crossover, at a randomly determined point in the chromosome. The length of the chromosome and the two parents are given. The children should be placed *offspringOne and *offspringTwo pointers that are passed to the function. The template follows:

void crossover(int parentOne, int parentTwo, int* offspringOne, int*);

Tip: Assume that fitness and chance of crossover (pc) has already been done; and that random() has been initialized and necessary libraries included. Just place the children into the pointers, do not calculate their fitness.

Answer:



11

Marks: 1

Consider the example of a genetic algorithm given in the text on pg. 224. Give C/C++ code for a function that takes an individual chromosome (given as a bit string) and calculates the fitness of that individual. The goal is to find the maximum of the function f(x) = 15x - x^2. The template of the function is:

float fitness(bool *chromosome, int chromLength);

Tips: The purpose of this particular genetic algorithm's simulation is the find the maxima of the function f(x).

Answer:

12

Marks: 1

The selection method where the ratio of fitness determines the chromosomes chance of being selected for mating is called:

Choose one answer.

- a. Roulette wheel
- b. Random
- c. Tournament
- d. No answers are correct

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