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**San Francisco Bay University**

**CS483 - Fundamentals of Artificial Intelligence**

**2022 Summer Quiz #2**

**Instruction:**

1. **Put your answer right after each question in the answer sheet**

1. Given a math function , create fitness function in genetic algorithm to find min value of it in the range of ∈[0, 2] and ∈[0, 2], and then encode both variables with 3-digits precision in fractional part to binary as chromosomes

2. Assuming the values from your fitness function as follows, try to create probability slot for parent selection in Roulette Wheel method. If F(x) is less than zero, select appropriate to round off

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| F(x) | Round off | Probabilities | Cum. Prob. | Prob.  Slot |
| 1.890178 |  |  |  |  |
| 3.924753 |  |  |  |  |
| 3.921282 |  |  |  |  |
| 2.395398 |  |  |  |  |
| 1.510119 |  |  |  |  |
| 3.480308 |  |  |  |  |
| 0.329135 |  |  |  |  |
| -0.49663 |  |  |  |  |
| -0.3319 |  |  |  |  |
| 2.130965 |  |  |  |  |

**\*Note:** Cum. Prob. is cumulative probabilities in short

3. Discuss about how to select crossover rate and mutation rate in genetic algorithm, and **why**?