

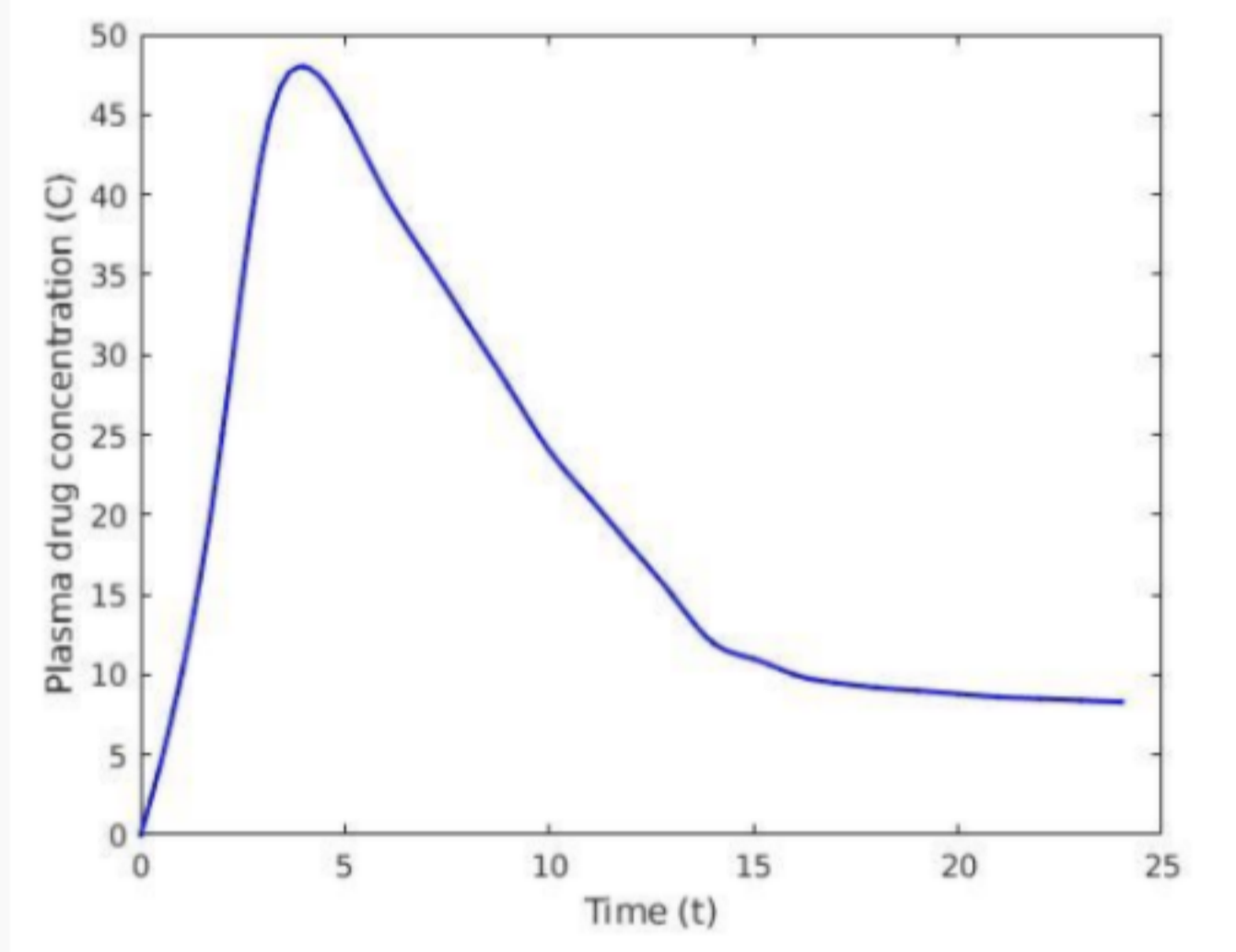
Unit 9 - Week 6

Course outline
How does an NPTEL online course work?
Prerequisite Assignment
MATLAB
Week 1
Week 2
Week 3
week 4
Week 5
Week 6
<input type="radio"/> 45 - Genetic Algorithms <input type="radio"/> 46 - Genetic Algorithms <input type="radio"/> 47 - Other Evolutionary Algorithms <input type="radio"/> 48 - PyGMO <input checked="" type="radio"/> 49 - Dynamic Modelling Recap <input type="radio"/> 50 - Lab: Parameter Estimation <input type="radio"/> 51 - Guest Lecture: Modelling in Drug Development <input type="radio"/> 52 - Guest Lecture: Modelling in Drug Development <input type="radio"/> 53 - Guest Lecture: Quantitative Systems Pharmacology <input type="radio"/> 54 - Guest Lecture: Quantitative Systems Pharmacology <input checked="" type="radio"/> 55 - Guest Lecture: Quantitative Systems Pharmacology
<input type="radio"/> Quiz : Practice Assignment 6 <input type="radio"/> Quiz : Assignment 6
<input checked="" type="radio"/> Computational Systems Biology : Week 6 Feedback Form
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Download Videos
Text Transcripts

Assignment 6

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-03-11, 23:59 IST.

- 1) Which of the following are operators used in genetic algorithms? 1 point
- Mutation
 - Crossover
 - Inversion
 - Recombination
 - Fertilisation
- No, the answer is incorrect. Score: 0
Accepted Answers: Mutation, Crossover, Recombination
- 2) Which of the following statements is/are true about Simulated annealing? 1 point
- This method helps employs strategies to escape local minima
 - Works on the principle of Metropolis criterion
 - The method is not at all sensitive to the initial conditions
 - The method always converges at the global minimum
 - The method is deterministic in nature
- No, the answer is incorrect. Score: 0
Accepted Answers: This method helps employs strategies to escape local minima, Works on the principle of Metropolis criterion
- 3) The likelihood with which Simulated annealing accepts solution- worsening transitions depends on: 1 point
- the temperature schedule
 - the magnitude of the change in energy
 - the solution where it currently is at
 - the previous decision on accepting/rejecting a transition
 - All of the above
- No, the answer is incorrect. Score: 0
Accepted Answers: the temperature schedule, the magnitude of the change in energy
- 4) Which of the following are important concepts in evolutionary algorithms? 1 point
- Temperature schedule
 - Population
 - Generation
 - Metropolis criterion
 - Momentum
- No, the answer is incorrect. Score: 0
Accepted Answers: Population, Generation
- 5) Which of the following statements about tournament selection in genetic algorithms is/are true? 1 point
- larger tournament sizes result in a higher selection pressure
 - smaller tournament sizes result in a higher selection pressure
 - larger tournament sizes result in a lower selection pressure
 - there is no correlation between selection pressure and tournament size
- No, the answer is incorrect. Score: 0
Accepted Answers: larger tournament sizes result in a higher selection pressure
- 6) The following figure shows a typical plot of plasma drug concentration (C) vs. time (t). Which of the following statements is/are true? 1 point
- 
- (mg/L)*h is an appropriate unit for Area Under the Curve [AUC] for Plasma Drug Concentration
 - At the peak of the drug concentration curve rate of uptake is equal to rate of elimination
 - After the time corresponding to the peak concentration, the drug is no longer absorbed
 - After the time corresponding to the peak concentration, the rate of drug elimination is higher than the rate of absorption
- No, the answer is incorrect. Score: 0
Accepted Answers: (mg/L)*h is an appropriate unit for Area Under the Curve [AUC] for Plasma Drug Concentration, At the peak of the drug concentration curve rate of uptake is equal to rate of elimination, After the time corresponding to the peak concentration, the rate of drug elimination is higher than the rate of absorption
- 7) If gene A and B are represented by the binary vectors 010101 and 100110 which of the following are possible results of a single-point crossover between gene A and B. 1 point
- 010100,100111
 - 010110,100101
 - 010111,100001
 - 000110,110101
 - 011000,101110
- No, the answer is incorrect. Score: 0
Accepted Answers: 010100,100111, 010110,100101, 000110,110101
- 8) Which of the following are examples of evolutionary algorithms? 1 point
- Ant colony optimisation
 - MATLAB fminsearch
 - Differential evolution
 - Evolution strategies
 - Particle swarm optimisation
 - Conjugate gradient method
- No, the answer is incorrect. Score: 0
Accepted Answers: Differential evolution, Evolution strategies
- 9) Which of the following are available migration topologies in PyGMO? 1 point
- Barabasi-Albert
 - Watts Strogatz
 - One-way ring
 - Ring
 - Fully connected
- No, the answer is incorrect. Score: 0
Accepted Answers: Barabasi-Albert, Watts Strogatz, One-way ring, Ring, Fully connected
- 10) For the simple PyGMO example discussed in class, as given below, which of the following statements is/are true? 1 point
- ```

from PyGMO import *
prob = problem.schwefel(dim = 50)
algo = []
for i in range(1,9):
 algo.append(algorithm.de(gen=500,variant=1))
archi = archipelago(topo=topology.ring())
for i in range(0,8):
 archi.push_back(island(algo[i],prob,20))
print min([isl.population.champion.f for isl in archi])

archi.evolve(20)
print min([isl.population.champion.f for isl in archi])

```
- The problem being optimised has a single minimum
  - The problem is being solved using nine variants of DE
  - The number of generations used in each DE is 5000
  - There is no migration operator employed
- No, the answer is incorrect. Score: 0  
Accepted Answers: The problem is being solved using nine variants of DE