Assignment 12

Due on 2019-10-22, 23:59 IST.

1. Consider a scenario involving the management of an enquiring single-exponential single process system at time 0. The state of the system is represented by a state vector O(0) and a state transition matrix A. The system is subject to a periodic interaction, represented by the matrix B. Describe the process and explain how the state vector evolves over time. What is the significance of the matrix B in this context?

2. In the context of the following algorithm, the state vector at the end of each iteration is updated by adding a new element to the previous state vector. Describe the process and explain how the state vector evolves over time. What is the significance of the new element in this context?

3. Consider a system that is represented by a set of differential equations. Describe the process and explain how the system evolves over time. What are the assumptions made in this context?

4. Given a function f(x) and an initial guess x0, the Newton-Raphson method is used to find the root of the function. Describe the process and explain how the root is approximated. What are the advantages and disadvantages of the Newton-Raphson method?

5. Consider a scenario involving the management of a simple queueing system. Describe the process and explain how the queue length evolves over time. What are the assumptions made in this context?

6. In the context of the following algorithm, the state vector at the end of each iteration is updated by adding a new element to the previous state vector. Describe the process and explain how the state vector evolves over time. What is the significance of the new element in this context?

7. Consider a scenario involving the management of a multi-exponential multi-process system. Describe the process and explain how the system evolves over time. What are the assumptions made in this context?

8. Given a function f(x) and an initial guess x0, the Broyden's method is used to find the root of the function. Describe the process and explain how the root is approximated. What are the advantages and disadvantages of the Broyden's method?

9. Consider a scenario involving the management of an enquiring two-exponential two-process system. Describe the process and explain how the system evolves over time. What are the assumptions made in this context?

10. Given a function f(x) and an initial guess x0, the secant method is used to find the root of the function. Describe the process and explain how the root is approximated. What are the advantages and disadvantages of the secant method?

11. Consider a scenario involving the management of an enquiring single-exponential single-process system at time 0. The state of the system is represented by a state vector O(0) and a state transition matrix A. The system is subject to a periodic interaction, represented by the matrix B. Describe the process and explain how the state vector evolves over time. What is the significance of the matrix B in this context?

12. Given a function f(x) and an initial guess x0, the fixed-point iteration method is used to find the root of the function. Describe the process and explain how the root is approximated. What are the advantages and disadvantages of the fixed-point iteration method?