Republic of the Philippines
SULTAN KUDARAT STATE UNIVERSITY
Isulan Camus, Isulan Sultan Kudarat
College of Computer Studies
Bachelor of Science in Information System

CC 114 – Data Structure and Algorithm
Midterm Exam

Name: _____ Course/Yr/Section_____ Score: _____

Instructions:

- Read each question carefully and encircle the letter of the correct answer.
- You have 2 hours to complete the exam.

1. What is a data structure?
   A. A set of instructions for solving a problem
   B. A way to organize and store data
   C. A programming language
   D. A type of algorithm
2. Which of the following is NOT a data structure?
   A. Array
   B. Linked List
   C. Stack
   D. Compiler
3. What is the primary purpose of an algorithm?
   A. To store data
   B. To organize data
   C. To solve a problem
   D. To compile code
4. Which of the following is an example of a data structure?
   A. A recipe
   B. A stack
   C. A compiler
   D. A programming language
5. What is the role of a stack in data structures?
   A. To store data in a random order
   B. To store data in a LIFO (Last In, First Out) order
   C. To store data in a FIFO (First In, First Out) order
   D. To store data in a sorted order
6. What is the role of a queue in data structures?
   A. To store data in a random order
   B. To store data in a LIFO (Last In, First Out) order
   C. To store data in a FIFO (First In, First Out) order
   D. To store data in a sorted order
7. What is the purpose of a linked list?
   A. To store data in contiguous memory locations
   B. To store data in non-contiguous memory locations
   C. To store data in a sorted order
   D. To store data in a random order
8. Why are data structures important in programming?
   A. They help in organizing and managing data efficiently
   B. They help in compiling code
   C. They help in solving algorithms
   D. They help in designing user interfaces
9. What is the difference between a stack and a queue?
   A. A stack follows LIFO, while a queue follows FIFO
   B. A stack follows FIFO, while a queue follows LIFO
   C. A stack and a queue are the same
   D. A stack is used for compiling code, while a queue is used for data organization
10. What is the advantage of using a linked list over an array?
    A. A linked list allows dynamic resizing
    B. A linked list is always sorted
    C. A linked list is faster to access
    D. A linked list is used for compiling code

11. Which data structure is best suited for implementing a LIFO (Last In, First Out) system?
    A. Array
    B. Linked List
    C. Stack
    D. Queue
12. Which data structure is best suited for implementing a FIFO (First In, First Out) system?
    A. Array
    B. Linked List
    C. Stack
    D. Queue
13. What is the time complexity of accessing an element in an array?
    A. O(1)
    B. O(log n)
    C. O(n)
    D. O(n^2)

14. What is the time complexity of inserting an element in a linked list?
    A. O(1)
    B. O(log n)
    C. O(n)
    D. O(n^2)
15. What is the time complexity of removing an element from a stack?
    A. O(1)
    B. O(log n)
    C. O(n)
    D. O(n^2)
16. Why is a stack used in function call management?
    A. It follows LIFO, which matches the order of function calls
    B. It follows FIFO, which matches the order of function calls
    C. It is used for compiling code
    D. It is used for data organization
17. Why is a queue used in task scheduling?
    A. It follows LIFO, which matches the order of task scheduling
    B. It follows FIFO, which matches the order of task scheduling
    C. It is used for compiling code
    D. It is used for data organization
18. What is the advantage of using an array for data storage?
    A. It allows dynamic resizing
    B. It allows random access to elements
    C. It is always sorted
    D. It is used for compiling code
19. What is the disadvantage of using a linked list for data storage?
    A. It does not allow random access to elements
    B. It does not allow dynamic resizing
    C. It is always sorted
    D. It is used for compiling code
20. What is the purpose of a hash table in data structures?
    A. To store data in a random order
    B. To store data in a LIFO order
    C. To store data in a FIFO order
    D. To store data with fast access using keys
21. Design a data structure to implement a LIFO (Last In, First Out) system.
    A. Array
    B. Linked List
    C. Stack
    D. Queue
22. Design a data structure to implement a FIFO (First In, First Out) system.
    A. Array
    B. Linked List
    C. Stack
    D. Queue
23. What is the best data structure to use for implementing a search engine's index?
    A. Array
    B. Linked List
    C. Stack
    D. Hash Table
24. What is the best data structure to use for managing a list of undo operations in a text editor?
    A. Array
    B. Linked List
    C. Stack
    D. Queue
25. What is the best data structure to use for managing a list of print jobs in a printer queue?
    A. Array
    B. Linked List
    C. Stack
    D. Queue
26. Which data structure is most efficient for random access to elements?
    A. Array
    B. Linked List
    C. Stack
    D. Queue
27. Which data structure is most efficient for dynamic resizing?
    A. Array
    B. Linked List
    C. Stack
    D. Queue
28. Which data structure is most efficient for implementing a search engine's index?
    A. Array
    B. Linked List
    C. Stack
    D. Hash Table
29. Which data structure is most efficient for managing a list of undo operations in a text editor?
    A. Array
    B. Linked List
    C. Stack
    D. Queue
30. Which data structure is most efficient for managing a list of print jobs in a printer queue?
    A. Array
    B. Linked List
    C. Stack
    D. Queue
31. What is the primary purpose of the int data type in C++?
    A. To store floating-point numbers
    B. To store integer values
    C. To store characters
    D. To store boolean values
32. What is the primary purpose of the float data type in C++?
    A. To store integer values
    B. To store floating-point numbers
    C. To store characters
    D. To store boolean values

33. What is the primary purpose of the char data type in C++?
    A. To store integer values
    B. To store floating-point numbers
    C. To store characters
    D. To store boolean values
34. What is the primary purpose of the bool data type in C++?
    A. To store integer values
    B. To store floating-point numbers
    C. To store characters
    D. To store boolean values
35. What is the primary purpose of the double data type in C++?
    A. To store integer values
    B. To store floating-point numbers with higher precision
    C. To store characters
    D. To store boolean values
36. Why is the int data type preferred for storing integer values?
    A. It is more precise than float
    B. It is more efficient for integer operations
    C. It is used for storing characters
    D. It is used for storing boolean values
37. Why is the float data type preferred for storing floating-point numbers?
    A. It is more precise than int
    B. It is more efficient for floating-point operations
    C. It is used for storing characters
    D. It is used for storing boolean values
38. Why is the char data type preferred for storing characters?
    A. It is more precise than int
    B. It is more efficient for character operations
    C. It is used for storing floating-point numbers
    D. It is used for storing boolean values
39. Why is the bool data type preferred for storing boolean values?
    A. It is more precise than int
    B. It is more efficient for boolean operations
    C. It is used for storing characters
    D. It is used for storing floating-point numbers
40. Why is the double data type preferred for storing floating-point numbers with higher precision?
    A. It is more precise than float
    B. It is more efficient for floating-point operations
    C. It is used for storing characters
    D. It is used for storing boolean values
41. Which data type is most suitable for storing the age of a person?
    A. int
    B. float
    C. char
    D. bool
42. Which data type is most suitable for storing the price of an item?
    A. int
    B. float
    C. char
    D. bool
43. Which data type is most suitable for storing the name of a person?
    A. int
    B. float
    C. char
    D. bool
44. Which data type is most suitable for storing the availability of an item?
    A. int
    B. float
    C. char
    D. bool
45. Which data type is most suitable for storing the temperature of a room?
    A. int
    B. float
    C. char
    D. bool
46. Why is the int data type more efficient for integer operations than the float data type?
    A. It is more precise
    B. It is designed for integer operations
    C. It is used for storing characters
    D. It is used for storing boolean values
47. Why is the float data type more efficient for floating-point operations than the int data type?
    A. It is more precise
    B. It is designed for floating-point operations
    C. It is used for storing characters
    D. It is used for storing boolean values
48. Why is the char data type more efficient for character operations than the int data type?
    A. It is more precise
    B. It is designed for character operations
    C. It is used for storing floating-point numbers
    D. It is used for storing boolean values
49. Why is the bool data type more efficient for boolean operations than the int data type?
    A. It is more precise
    B. It is designed for boolean operations
    C. It is used for storing characters
    D. It is used for storing floating-point numbers
50. Why is the double data type more precise for floating-point operations than the float data type?
    A. It is more efficient
    B. It is designed for higher precision
    C. It is used for storing characters
    D. It is used for storing boolean values
51. Design a data structure to store the age, name, and gender of a person.
    A. Array of int
    B. Array of char
    C. Struct with int, char, and bool
    D. Array of bool
52. Design a data structure to store the price, name, and availability of an item.
    A. Array of float
    B. Array of char
    C. Struct with float, char, and bool
    D. Array of bool

53. Design a data structure to store the temperature, humidity, and air quality of a room.
    A. Array of float
    B. Array of char
    C. Struct with float, float, and float
    D. Array of bool
54. Design a data structure to store the name, age, and gender of a list of students.
    A. Array of structs with char, int, and bool
    B. Array of char
    C. Array of int
    D. Array of bool
55. Design a data structure to store the name, price, and availability of a list of items.
    A. Array of structs with char, float, and bool
    B. Array of char
    C. Array of float
    D. Array of bool
56. Which data type is most efficient for storing the age of a person?
    A. int
    B. float
    C. char
    D. bool
57. Which data type is most efficient for storing the price of an item?
    A. int
    B. float
    C. char
    D. bool
58. Which data type is most efficient for storing the name of a person?
    A. int
    B. float
    C. char
    D. bool
59. Which data type is most efficient for storing the availability of an item?
    A. int
    B. float
    C. char
    D. bool
60. Which data type is most efficient for storing the temperature of a room?
    A. int
    B. float
    C. char
    D. bool
61. What is an array in C++?
    A. A data structure that stores elements in contiguous memory locations
    B. A data structure that stores elements in non-contiguous memory locations
    C. A data structure that stores elements in a stack
    D. A data structure that stores elements in a queue
62. What is a linked list in C++?
    A. A data structure that stores elements in contiguous memory locations
    B. A data structure that stores elements in non-contiguous memory locations
    C. A data structure that stores elements in a stack
    D. A data structure that stores elements in a queue
63. What is a stack in C++?
    A. A data structure that stores elements in contiguous memory locations
    B. A data structure that stores elements in non-contiguous memory locations
    C. A data structure that follows the LIFO principle
    D. A data structure that follows the FIFO principle
64. What is a queue in C++?
    A. A data structure that stores elements in contiguous memory locations
    B. A data structure that stores elements in non-contiguous memory locations
    C. A data structure that follows the LIFO principle
    D. A data structure that follows the FIFO principle
65. What is a tree in C++?
    A. A data structure that stores elements in a linear order
    B. A data structure that stores elements in a hierarchical order
    C. A data structure that follows the LIFO principle
    D. A data structure that follows the FIFO principle
66. Why is an array efficient for accessing elements by index?
    A. It stores elements in contiguous memory locations
    B. It stores elements in non-contiguous memory locations
    C. It follows the LIFO principle
    D. It follows the FIFO principle
67. Why is a linked list efficient for inserting and deleting elements?
    A. It stores elements in contiguous memory locations
    B. It stores elements in non-contiguous memory locations
    C. It follows the LIFO principle
    D. It follows the FIFO principle
68. Why is a stack efficient for managing function calls?
    A. It stores elements in contiguous memory locations
    B. It stores elements in non-contiguous memory locations
    C. It follows the LIFO principle
    D. It follows the FIFO principle

69. Why is a queue efficient for managing tasks in a printer queue?
    A. It stores elements in contiguous memory locations
    B. It stores elements in non-contiguous memory locations
    C. It follows the LIFO principle
    D. It follows the FIFO principle
70. Why is a queue efficient for managing tasks in a printer queue?
    A. It stores elements in a linear order
    B. It stores elements in a hierarchical order
    C. It follows the LIFO principle
    D. It follows the FIFO principle

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