

Daffodil International University
Department of Computing & Information System
Course Title: Algorithms
Course Code: CIS 132

Quiz-1

Time: 30 minutes

Instruction: Kindly write down your ID/Reg no., Quiz/Class-test no., Session & Date of quiz on the answer sheet.

- | | Marks |
|---|--------------|
| 1. What is Algorithm? What are the properties of algorithm? | 3 |
| 2. Define Best, Worst & Average case complexity. | 3 |
| 3. Calculate the time complexity of the following codes: | 6 |
| <pre>a) for (int i = 1; i <= n; i++) {
 for (int j = 1; j <= n; j++) {
 for (int k = 1; k <= i; k++) {
 int value = i * j * k;
 cout << value << std::endl; }
 }
 }</pre> | |
| <pre>b) for (int i = 0; i < rows; ++i) {
 for (int j = 0; j < cols; ++j) {
 cout << "Element at position (" << i + 1 << ", " << j + 1 << "): ";
 cin >> matrix[i][j];
 }
 cout << "The matrix is:" << endl;
 for (int i = 0; i < rows; ++i) {
 for (int j = 0; j < cols; ++j) {
 cout << matrix[i][j] << " ";
 }
 cout << endl;
 }
}</pre> | |
| <pre>c) for (int i = 1; i <= n; i++) {
 for (int j = 1; j <= (log(n)); j++) {
 int sum = i + j;
 cout << sum << endl;
 }
}</pre> | |
| 4. What does it mean by "Algorithm Analysis"? Differentiate between "Priori" & "Posteriori" analysis? | 3 |

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Quiz-2

Time: 45 minutes

Instruction: Kindly write down your ID/Reg no., Quiz/Class-test no., Session & Date of quiz on the answer sheet.

- | | Marks |
|---|--------------|
| 1. Given the array $A = [29, 10, 14, 37, 13]$, perform one complete iteration of each of the following sorting algorithms and show the array after each step:
a) Bubble Sort
b) Insertion Sort | 5 |
| 2. Explain why Quick Sort is generally faster than Bubble Sort, Selection Sort, and Insertion Sort in terms of time complexity. Include a brief comparison of their average-case time complexities. | 3 |
| 3. Given the array $A = [20, 35, 15, 40, 50, 10, 5]$, explain the steps of the Merge Sort algorithm in dividing and merging the array. What will the array look like after the first full merge phase? | 4 |
| 4. Given an array $A = [329, 457, 657, 839, 436, 720, 355]$, illustrate the first two passes of Radix Sort (base 10) as it sorts the array. | 3 |

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Quiz-3

Time: 45 minutes

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Marks

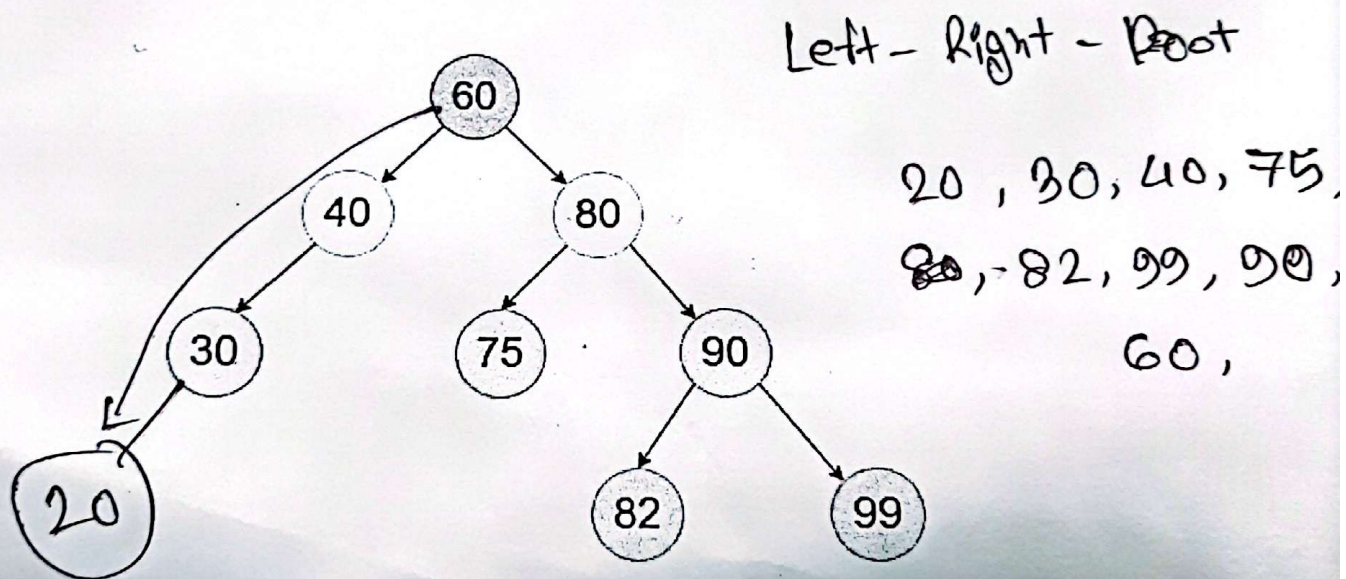
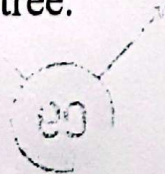


Figure-1: Binary Search Tree

1. Answer the following questions:

- a. Insert "20" into the above tree.
- b. Print the "Post-order" series of the tree after the completion of the above-mentioned operation.
- c. Delete "75" & "90" from the above tree.
- d. Re-draw the BST after execution of the above-mentioned operations. Check if the tree is AVL or not. If not, execute necessary operations to convert into an "AVL" tree.



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Quiz-Makeup

Time: 45 minutes

Instruction: Kindly write down your ID/Reg no., Quiz/Class-test no., Session & Date of quiz on the answer sheet.

Marks
5

1. Explain the given graph.

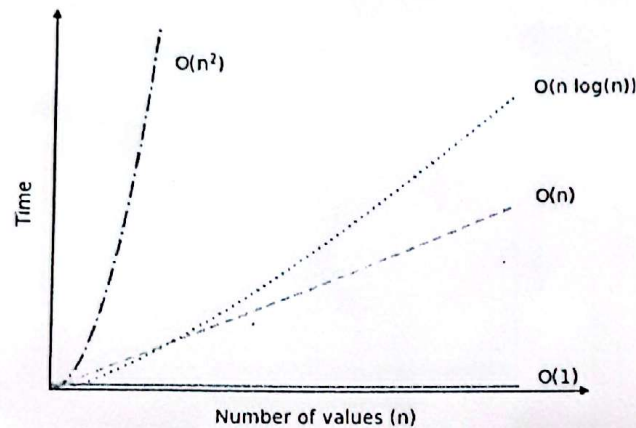


Figure 1: Time complexity in Algorithms

2. Given the array $A = [78, 56, 34, 90, 21, 47]$, perform each of the following sorting algorithms and show the array after each step: 5
- a) Merge Sort
 - b) Selection Sort
3. Print Pre-order, In-order, Post-order series of the given graph with detail process 5

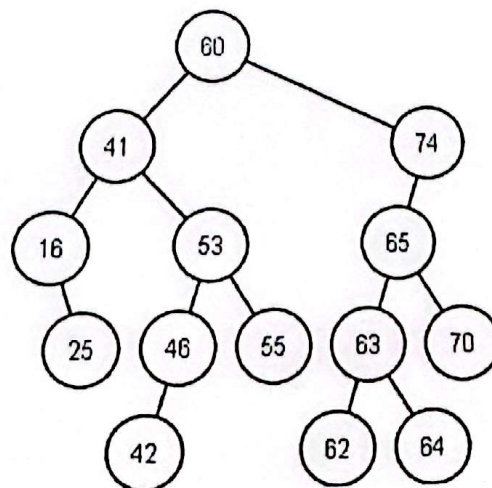


Figure 2: Binary Search Tree