Day 12 – 27/06/2025

Q1. What do you understand about data structures?  
Ans. Data structures are ways to organize and store data in a computer so that it can be efficiently accessed, modified, and manipulated. They provide a way to manage large amounts of data, enabling efficient data retrieval, insertion, deletion, and manipulation.

Q2. What are the types of data structures you know?  
Ans.

1. Arrays
2. Linked lists
3. Stacks
4. Queues
5. Hash maps
6. Trees
7. Graphs

Q3. What all operations can we do in Data structures?  
Ans.

1. Insertion
2. Deletion
3. Traversal
4. Search
5. Update
6. Sorting
7. Merging

Q4. What are static and dynamic arrays? Explain or summarize key points in a table.  
Ans.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Size | Performance | Memory | Flexibility | Limitations |
| Static | Fixed size determined at compile-time. | Fast access and modification due to contiguous memory allocation. | Memory is allocated at compile-time and remains fixed. | Less flexible due to fixed size. | May lead to wasted memory if not fully utilized or may not be enough if more elements are added. |
| Dynamic | Size can be changed dynamically at runtime. | Performance may be affected by resizing and reallocation. | Memory is allocated and deallocated dynamically. | More flexible as size can be adjusted dynamically. | May incur performance overhead due to resizing and reallocation. |

Q5. What is the binary value of a?  
Ans. ASCII code of ‘a’ is 97.

import java.util.Scanner;  
  
public class Main {  
 public static void main(String[] args) {  
 int x = 65;  
 Scanner scanner = new Scanner(System.*in*);  
 System.*out*.print("Enter character to covert: ");  
 String chr = scanner.next();  
 x = chr.charAt(0);  
 String bin = "";  
 while (x>0){  
 bin += String.*valueOf*((x%2));  
 x /= 2;  
 }  
 System.*out*.println("Binary of "+chr+": "+ bin);  
 scanner.close();  
 }  
}

