**Chapter 7- Core Computer Science Concepts**

**Data Structures:**

1. **Linked Lists**
2. **Trees, Tries & Graphs**
3. **Stacks and Queues**
4. **Heaps**
5. **Vectors / ArrayLists**
6. **Hash Tables \***

**Algorithms:**

1. **Breadth-First Search**
2. **Depth-First Search**
3. **Binary Search**
4. **Merge Sort**
5. **Quick Sort**

**Concepts:**

1. **Bit Manipulation**
2. **Memory (Stack vs. Heap)**
3. **Recursion**
4. **Dynamic Programming**
5. **Big O- Time & Space Complexity**

**The table below is useful for many questions involving scalability or any sort of memory limitation:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Power of 2** | **Exact Value(X)** | **Approx. Value** | **X Bytes into MB, GB, etc..** |
| **7** | **128** |  |  |
| **8** | **256** |  |  |
| **10** | **1024** | **1 thousand** | **1 KB** |
| **16** | **65536** |  | **64 KB** |
| **20** | **1,048,576** | **1 million** | **1 MB** |
| **30** | **1,073,741,824** | **1 billion** | **1 GB** |
| **32** | **4,294,967,296** |  | **4 GB** |
| **40** | **1,099,511,627,776** | **1 trillion** | **1 TB** |

**Pg 74**