**Name: Rimsha Laraib**
**Seat no.: B21110006107**
**Course: Design Analysis & Algorithm**

---

# Lab Assignment

**Q: Investigate is google search uses DFS , BFS , unweighted, weighted, directed or undirected algorithms.**

Google uses a combination of BFS and DFS strategies, weighted and directed graph depending on what it's doing.

### BFS (Breadth-First Search)

1.    Starts from a set of known websites (seed URLs).
2.    Visits their links, then the links from those pages, and so on.
3.    It's used to discover new pages efficiently layer by layer.

### Why BFS is useful here:

1.  Google wants to cover the whole web fast.
2.  BFS finds new pages in the "nearest layers" first — efficient for fresh crawling.

### DFS (Depth-First Search)

 Sometimes used within one site, where the crawler dives deep into internal links before backing up.
 Useful for exploring a specific domain in depth (like going deep into subpages).

### Why DFS helps:

 Helps fully index a website before returning.
 Works well for structured sites (blogs, forums, product catalogs).

### Why Weighted & Directed Graph:

Google Search models the web as a directed and weighted graph. It's directed because web links go one way — when one site links to another, the link doesn't automatically go back. It's weighted because not all links are equally important; links from trusted or popular sites carry more weight than those from less-known pages. This helps Google decide which pages are more valuable and should appear higher in search results, using algorithms like PageRank that measure link direction and importance.