1. Jelaskan kepada asisten tentang apa yang anda ketahui tentang graph dan jelaskan pula perbedaan antara Struktur data Tree dan Struktur data Graph.
   1. Graph adalah struktur data dengan relasi many to many, yaitu tiap element dapat memiliki 0 atau lebih dari 1 cabang. Graph terdiri dari 2 komponen yaitu Node (digunakan untuk menyimpan data) dan Edge (cabang, untuk menghubungkan node satu dengan node lain). Tree kurang lebih sama tetapi yang membedakan tiap element hanya bisa memiliki satu induk atau akar. Perbedaan lainya adalah graph tidak memiliki root/akar sedangkan pohon punya.
2. G = {V, E}

V = {A, B, C, D, E, F, G}

E = {(A, B), (B, C), (B, E), (B, D), (C, E), (C, D), (D, E), (D, A) (E, F), (G, D),}

In – Degree (A) : 1 Out – Degree (A) : 1

In – Degree (B) : 1 Out – Degree (B) : 3

In – Degree (C) : 1 Out – Degree (C) : 2

In – Degree (D) : 3 Out – Degree (D) : 1 Jumlah Edge : 10

In – Degree (E) : 3 Out – Degree (E) : 1

In – Degree (F) : 1 Out – Degree (F) : 0

In – Degree (G) : 0 Out – Degree (G) : 1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | A | B | C | D | E | F | G |
| A | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| B | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| C | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| D | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| E | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| F | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| G | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

Weight (A,B): 1 Weight (C,D): 1

Weight (B,C): 3 Weight (D,E): 2

Weight (B,E): 1 Weight (D,A): 2

Weight (B,D): 2 Weight (E,F): 3

Weight (C,E): 4 Weight (G,D): 1

1. DFS

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 |  |  |  |  |  |  |  |  |  |
| 2 | 4 |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 |  |  |  |  |  |  |  |  |
| 5 | 4 |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 5 |  |  |  |  |  |  |  |
| 3 | 9 | 7 | 4 |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 5 | 3 |  |  |  |  |  |  |
| 9 | 7 | 4 |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 5 | 3 | 9 |  |  |  |  |  |
| 8 | 7 | 4 |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 5 | 3 | 9 | 8 |  |  |  |  |
| 11 | 7 | 4 |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 5 | 3 | 9 | 8 | 11 |  |  |  |
| 10 | 7 | 4 |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 5 | 3 | 9 | 8 | 11 | 10 |  |  |
| 7 | 6 | 4 |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 5 | 3 | 9 | 8 | 11 | 10 | 7 |  |
| 6 | 4 |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 5 | 3 | 9 | 8 | 11 | 10 | 7 | 6 |  |
| 4 |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 5 | 3 | 9 | 8 | 11 | 10 | 7 | 6 | 4 |
|  |  |  |  |  |  |  |  |  |  |  |

BFS

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 | 4 |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 |  |  |  |  |  |  |  |  |  |
| 4 | 5 |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 4 |  |  |  |  |  |  |  |  |
| 5 | 6 |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 4 | 5 |  |  |  |  |  |  |  |
| 6 | 3 | 9 | 7 |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 4 | 5 | 6 |  |  |  |  |  |  |
| 3 | 9 | 7 |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 4 | 5 | 6 | 3 |  |  |  |  |  |
| 9 | 7 |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 4 | 5 | 6 | 3 | 9 |  |  |  |  |
| 7 | 8 |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 4 | 5 | 6 | 3 | 9 | 7 |  |  |  |
| 8 | 11 |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 4 | 5 | 6 | 3 | 9 | 7 | 8 |  |  |
| 11 |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 4 | 5 | 6 | 3 | 9 | 7 | 8 | 11 |  |
| 10 |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 4 | 5 | 6 | 3 | 9 | 7 | 8 | 11 | 10 |
|  |  |  |  |  |  |  |  |  |  |  |