hw2-dmurad12

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1 Problem1

1. $\log_2 n$
   - Increasing n fourfold to $4n$, we get $\log_2(4n)$.
   - The function's value increases by 2.
2. $\sqrt{n}$
   - Increasing n fourfold to $4n$, we get $2\sqrt{n}$.
   - The function's value doubles.
3. n
   - If n increases fourfold, then the function's value becomes $4n$.
   - The function's value quadruples.
4. n^2
   - For n increased fourfold, we get $16n^2$.
   - The function's value increases 16 times.
5. n^3
   - Increasing n fourfold, we get $64n^3$.
   - The function's value increases 64 times.
6. 2^n
   - For a fourfold increase in n, we get 2^{4n}.
   - The function's value increase to the power of 4.

2 Problem2: Graph

a, b, c, d, e, f,g.

2.1 Adjacency Matrix

	a	b	c	d	e	f	g
a	0	1	1	1	1	0	0
b	1	0	0	1	0	1	0
c	1	0	0	0	1	0	1
d	1	1	0	0	0	1	0
e	1	0	1	0	0	0	0
f	0	1	0	1	0	0	0
g	0	0	1	0	0	0	0

2.2 Adjacency Lists

$a : \{b, c, d, e\}$

b : {a, d, f}

c : {a, e, a, g}

d : {a, b, f}

e : {a, c}

f : {b, d}

g : {c}

2.3 DFS Ordering

$$a, b, d, f, c, e, g$$

2.4 BFS Ordering

$$a, b, c, d, e, f, g$$

3 Problem3

3.1 Pseudocode

1: **function** isPartitionPossible(set, index, currentSum, totalSum)
2: **if** $currentSum = \frac{totalSum}{2}$ **then**

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3:          return true
4:      end if
5:      if index ≥ length(set) or currentSum > totalSum/2 then
6:          return false
7:      end if
8:      return isPartitionPossible(set, index + 1, currentSum + set[index],
    totalSum) or
9:       isPartitionPossible(set, index + 1, currentSum, totalSum)
10: end function
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