Graphs Beginner - Problem Solving

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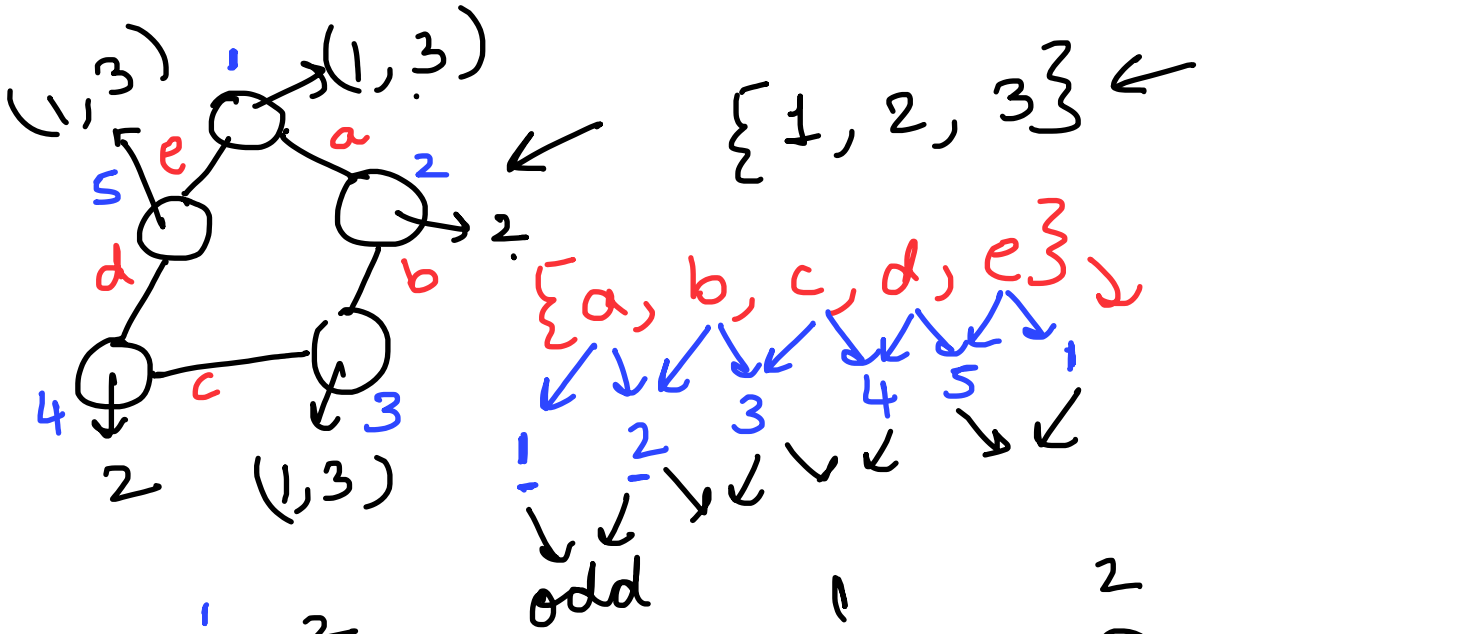
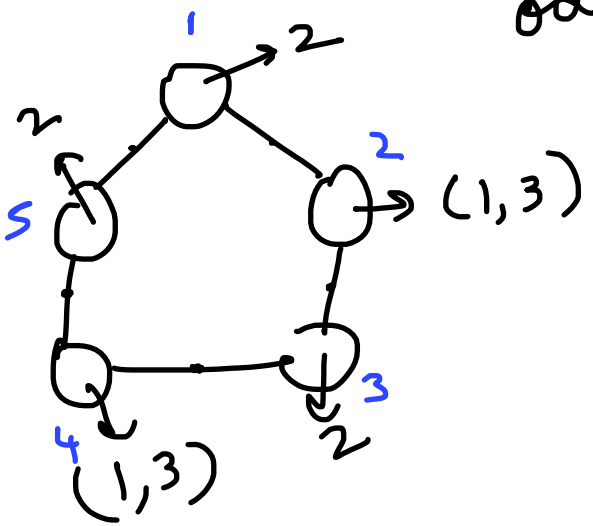
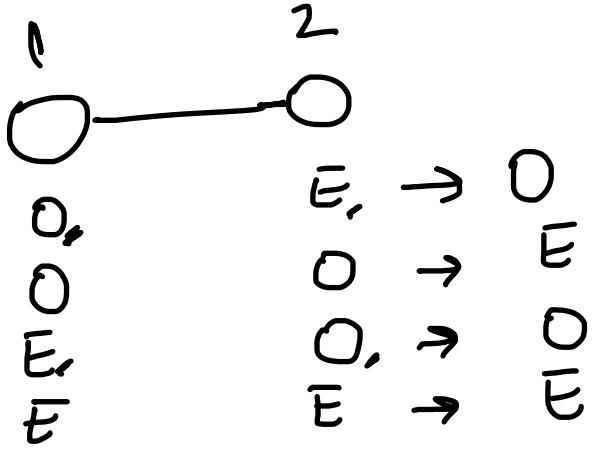
Problem 1:

Beautiful Graph:
https://codeforces.com/contest/1093/problem/D

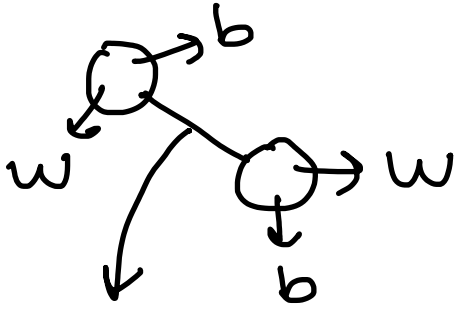






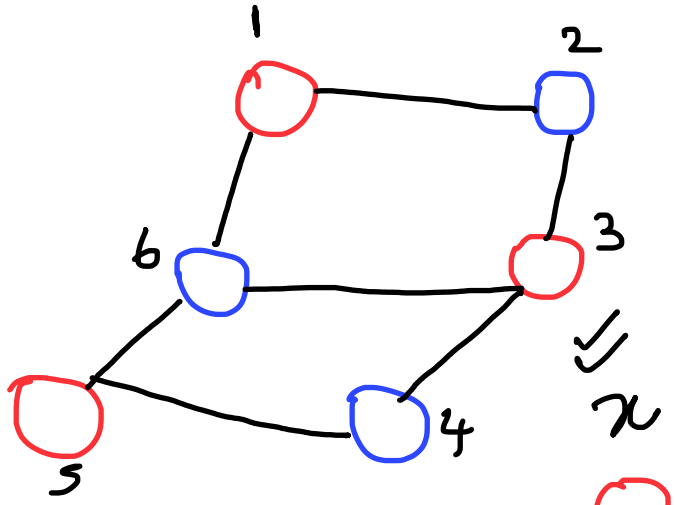
Value 2 → black "

Value (1 or 3) → white "



1) Find if graph is bipartite.

2)



(1, 3, 5)

→ Value 2

→ Value (1 or 3)

2^y

2^x

(2, 4, 6)

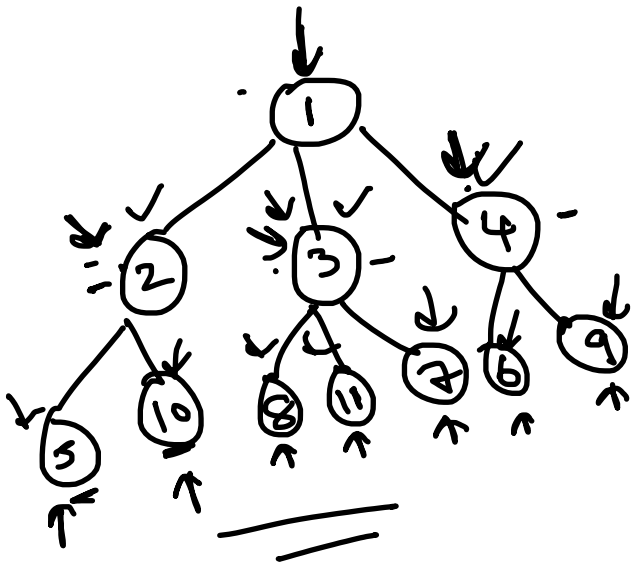
→ Value (1 or 3)

→ Value 2

$2^x + 2^y$

Problem 2

Valid BFS?:
https://codeforces.com/contest/1037/problem/D



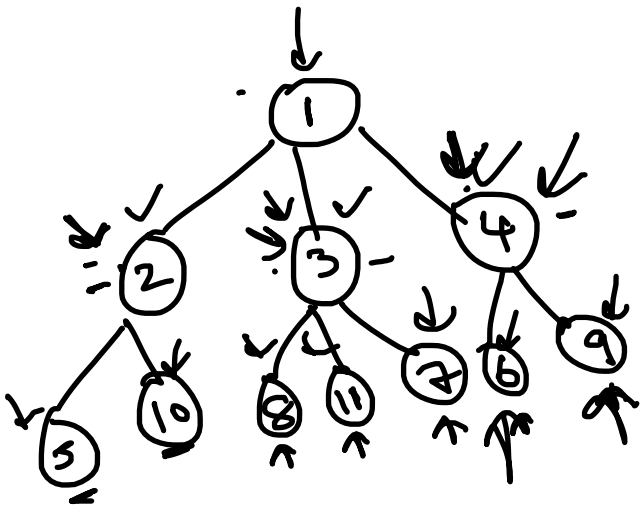
1 2 3 4 5 6 7 8 9 10 11

5 10 8 11 7 6 9

1 2 3 4 8 11 7 6 9 5 10

5 10

1, 4, 3, 2, 9, 6, 7, 11, 8, 10, 5



1 → {2, 3, 4}.

2 → {1, 5, 10}

3 → {1, 7, 8, 11}

4 → {1, 6, 9}

5 → 2 {1, 6, 9}

6 → 4

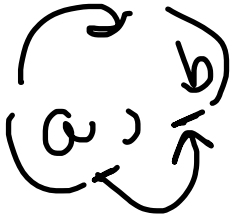
7 → 3

8 → 3

9 → 4

10 → 2

11 → 3

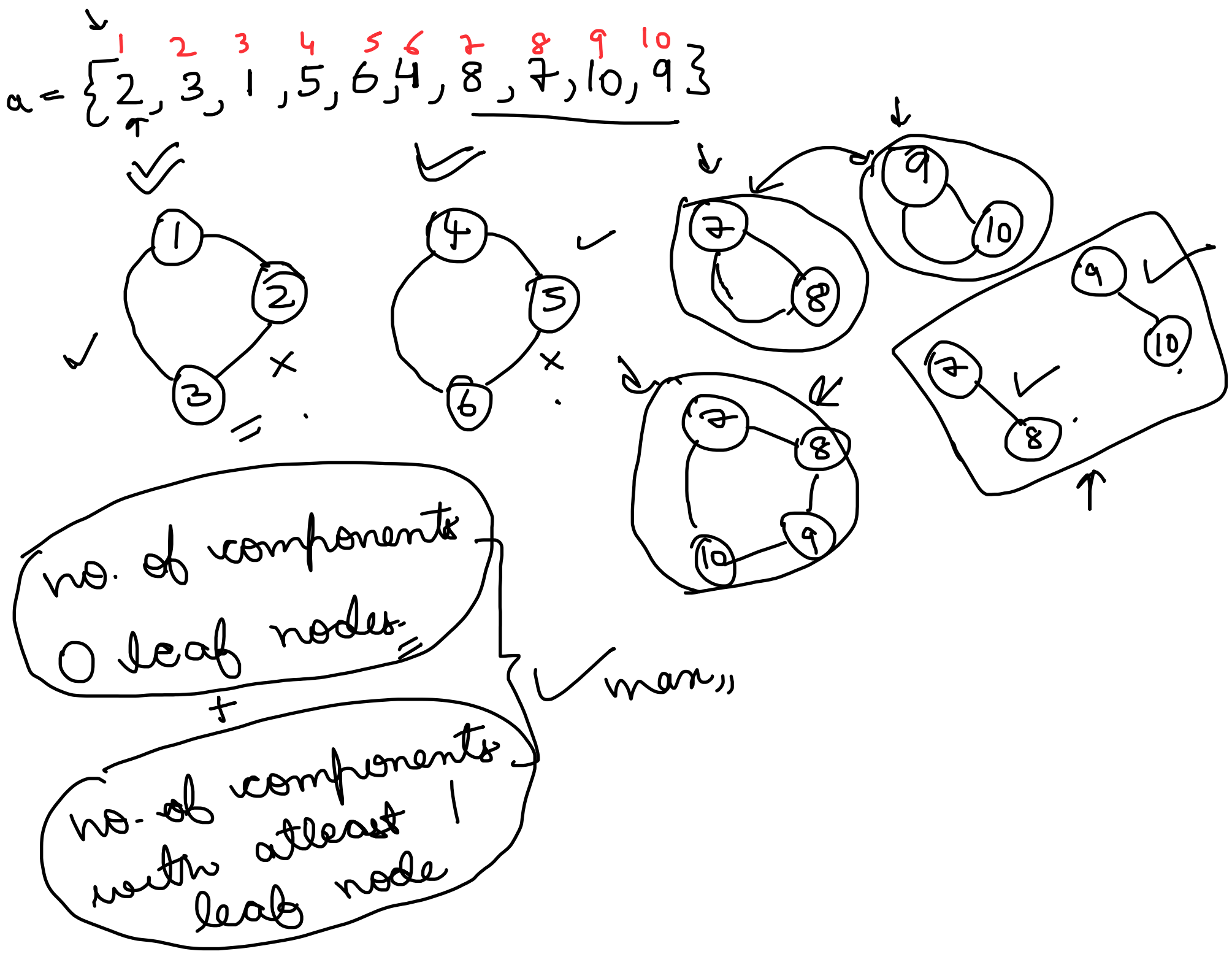


3 → {1, 8, 11, 7}

1 2 3 4 8 11 7 6 9 5 10

Problem 3

Round Dance:
https://codeforces.com/contest/1833/problem/E


1 2 3 4 5 6 7 8 9 10
a = {2, 3, 1, 5, 6, 4, 8, 7, 10, 9}
no. of components
= no. of leaf nodes
+
no. of components with atleast 1 leaf node
max

min → no. of components with 0 leaf nodes

+

min (no. of components with atleast 1 leaf node)

1

Problem 4

Message Route:
https://cses.fi/problemset/task/1667