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WR# 14

E:

4: (b,h) ① ✓
4: (d,g) ② ✓
5: (a,c) ③ ✓
7: (b,g) ④ ✓
8: (a,h) ⑤ ✓
9: (b,c) ×
10: (c,d) ×
11: (g,h) ×
12: (a,b) ×
12: (d,e) ⑥ ✓
14: (c,e) ×
18: (f,h) ⑦ ✓
19: (d,f) ×

CC:

{a} {b} {c} {d} {e} {f} {g} {h}

① → {a} {b,h} {c} {d} {e} {f} {g}

② → {a} {b,h} {c} {d,g} {e} {f}

③ → {a,c} {b,h} {d,g} {e} {f}

④ → {a,c} {b,h,d,g} {e} {f}

⑤ → {a,c,b,h,d,g} {e} {f}

⑥ → {a,c,b,h,d,g,e} {f}

⑦ → {a, c, b, h, d, g, e, f}

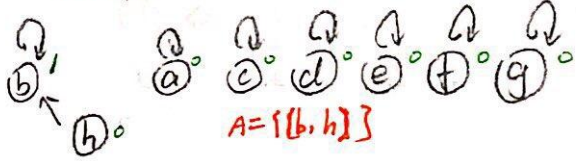
— A
— rank

Tree-Based Union-Find

After initialization.

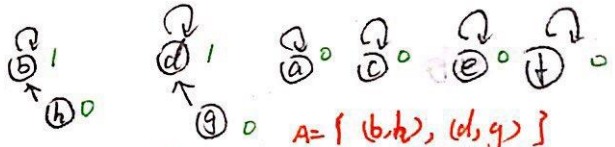
A ← ∅

① (b,h) b → rank = 0, h → rank = 0 we have



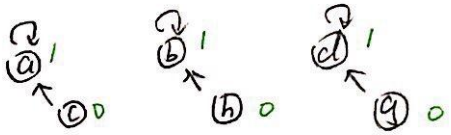
A = {(b,h)}

② (d,g) d → rank = 0, g → rank = 0. we have



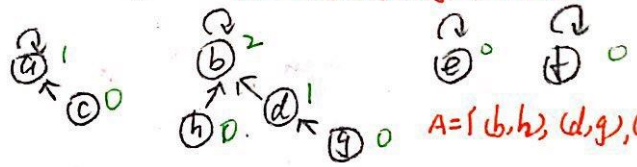
A = {(b,h), (d,g)}

③ (a,c) a → rank = 0, c → rank = 0



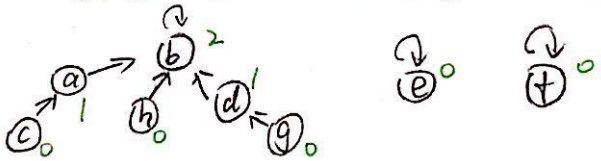
A = {(b,h), (d,g), (a,c)}

④ (b,g) b → rank = 1 = d → rank = 1



A = {(b,h), (d,g), (a,c), (b,g)}

⑤ (a,h) a → rank = 1 < b → rank = 2



A = {(b,h), (d,g), (a,c), (b,g), (a,h)}

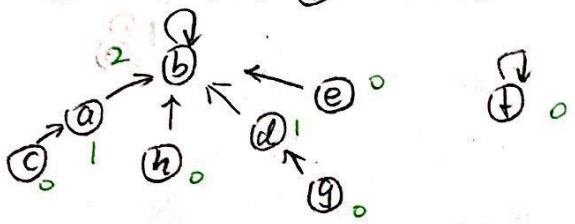
(b,c) findCC(b) = findCC(c) ⇒ ⓑ

(c,d) findCC(c) = findCC(d) ⇒ ⓑ

(g,h) findCC(g) = findCC(h) ⇒ ⓑ

(a,b) findCC(a) = findCC(b) ⇒ ⓑ

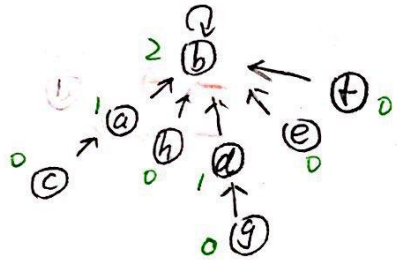
⑥ (d,e) ⓑ → rank = 2 > ⓔ → rank = 0



A={ (b,h), (d,g), (a,c), (b,g), (a,h), (d,e) }

(c,e) findCC(c) = findCC(e) ⇒ ⓑ

⑦ (f,h) ⓕ → rank = 0 < ⓑ → rank = 2



A={ (b,h), (d,g), (a,c), (b,g), (a,h), (d,e), (f,h) }

⇒ A={ ①, ②, ③, ④, ⑤, ⑥, ⑦ }

(d,f) findCC(d) = findCC(f) ⇒ ⓑ