Problem I: Cousin’s Aunt

Original: Hayashizaki

Statement: Terashima

Solution: Terashima, Hachimori

Slide: Terashima

Problem (1)

- Find the maximum and minimum degree of kinship
  - Given relation is a chain of below
    - father, mother, son, daughter
    - husband, wife, brother, sister
    - grandfather, grandmother, grandson, granddaughter
    - uncle, aunt, nephew, niece

Problem (2)

- There are no special relations
  - adoptions
  - marriages between relatives
  - divorces, remarriages
  - bigamous marriages
  - same-sex marriages
- Given family has simple structure

Approach

1. Convert to primitive relations and list up all possibility
2. Apply reduction rules
3. Get the degree of kinship

Convert to primitive relations

- grandfather
  -> F-F | M-F
- grandson
  -> s-s | d-s
- uncle -> F-B | M-B
- nephew -> B-s | S-s
- A -> m | f
- grandmother
  -> F-M | M-M
- granddaughter
  -> s-d | d-d
- aunt -> F-S | M-S
- niece -> B-d | S-d

F : father, s: son, H: husband, B: brother, m: male
M: mother, d: daughter, W: wife, S: sister, f: female

Apply reduction rules (1)

- F-s -> -m and B
- F-d -> -f and S
- F-H -> n/a
- F-W -> M
- M-s -> -m and B
- M-d -> -f and S
- M-H -> F
- M-W -> n/a

F : father, s: son, H: husband, B: brother, m: male
M: mother, d: daughter, W: wife, S: sister, f: female
-m: remove if the previous one is F, s, H, B or m
-f: remove if the previous one is M, d, W, S or f

Apply reduction rules (2)

- s-F -> -m or H
- s-M -> -f or W
- s-H -> n/a
- s-B -> s
- s-S -> d

- d-F -> -m or H
- d-M -> -f or W
- d-W -> n/a
- d-B -> s
- d-S -> d

F : father, s: son, H: husband, B: brother, m: male
M: mother, d: daughter, W: wife, S: sister, f: female
-m: remove if the previous one is F, s, H, B or m
-f: remove if the previous one is M, d, W, S or f

Apply reduction rules (3)

- H-s -> s
- H-d -> d
- H-H -> n/a
- H-W -> -f
- W-s -> s
- W-d -> d
- W-H -> -m
- W-W -> n/a

F : father, s: son, H: husband, B: brother, m: male
M: mother, d: daughter, W: wife, S: sister, f: female
-m: remove if the previous one is F, s, H, B or m
-f: remove if the previous one is M, d, W, S or f

Apply reduction rules (4)

- B-F -> F
- B-M -> M
- B-B -> -m and B
- B-S -> -f and S
- S-F -> F
- S-M -> M
- S-B -> -m and B
- S-S -> -f and S

F : father, s: son, H: husband, B: brother, m: male
M: mother, d: daughter, W: wife, S: sister, f: female
-m: remove if the previous one is F, s, H, B or m
-f: remove if the previous one is M, d, W, S or f

Get the degree of kinship

- Just add the distance of relations
  - Distance
    - H, W, m, f : 0
    - F, M, s, d : 1
    - B, S : 2
- Output the max and min values

Example

C is A's father's brother's son’s aunt

mFBsFS	fFBsFS	mFBsMS	fFBsMS
mFBS	fFBS	mFBWS	fFBWS
mFS	fFS	5	5
3	3		

Result

- Submitted: 0 (0 teams)
- Solved: 0