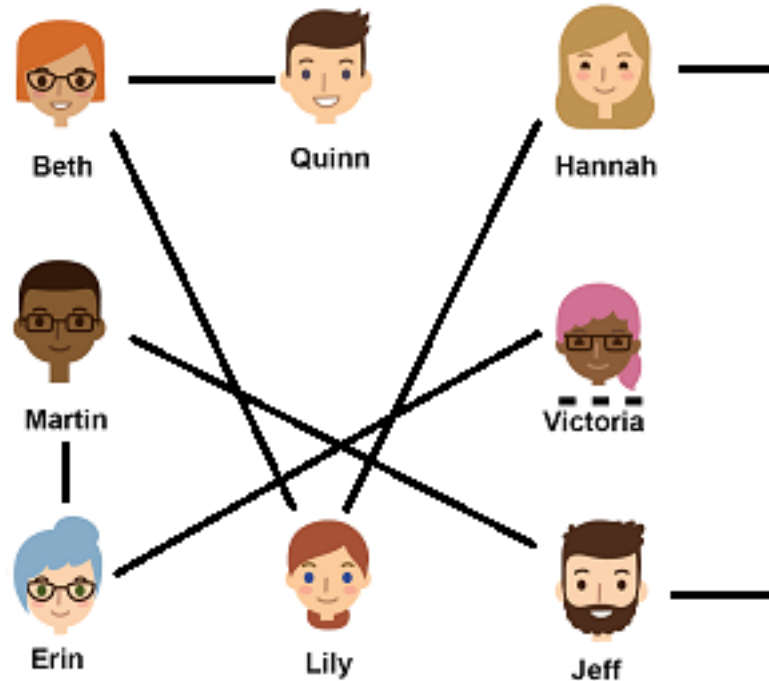**Definition 1.** *A group from the Totman family went to the theatre. The map below identifies the pairs in the **NextTo** relation.*

*The **NextTo** relation includes three sets:*

- *A first set consisting of 8 family members identified in the map.*

- *A second set consisting of 8 family members identified in the map.*

- *A set of family ordered pairs. The pair (first person, second person) is a member of the NextTo relation if the first person and the second person were standing next to each other in line.*
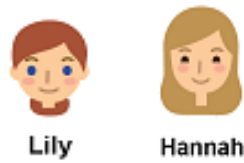
Exercise 1 *(* Lily *,* Hannah *)* ∈ *NextTo*

Multiple Choice:

(a) *True* ✓

(b) *False*

Feedback (attempt):   *Lily and Hannah are connect in the map.*
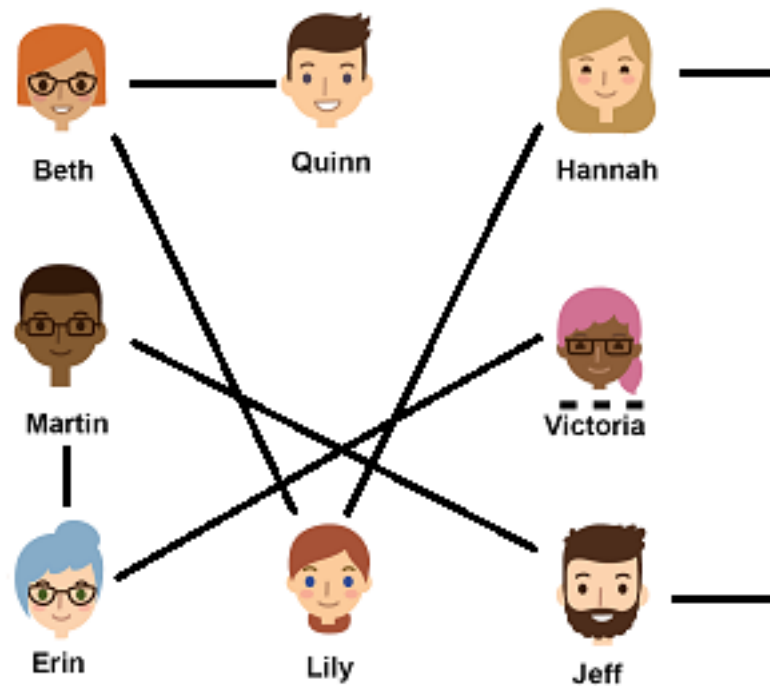

Exercise 2 *Who was definitely not the first family member in line?*

Select All Correct Answers:

(a) *Jeff* ✓

(b) *Victoria*

(c) *Hannah* ✓

(d) *Martin* ✓

(e) *Quinn*

(f) *Erin* ✓

(g) *Beth* ✓

(h) *Lily* ✓

Feedback (attempt):   *The first and last person in line are connected to only one other person.*

Definition 2. *Suppose Victoria was the first family member in line. Now, let the map define the **InFrontOf** relation.*

The **InFrontOf** relation includes three sets:

- *A first set consisting of 8 family members identified in the map.*

- *A second set consisting of the same 8 family members identified in the map.*

- *A set of family ordered pairs. The pair (first person, second person) is a member of the InFrontOf relation if the first person is standing in front of the second person in line (anywhere closer to the front of the line).*

Exercise 3 *(* Martin *,* Erin *)* ∈ *InFrontOf*

Multiple Choice:

(a) *True*

(b) *False* ✓

Feedback (attempt):   Erin is standing in front of Martin.

Exercise 4 (**Jeff** , **Quinn**) ∈ *InFrontOf*

Multiple Choice:

   (a) *True* ✓

   (b) *False*

Feedback (attempt):   Quinn is last in line. Everyone is in front of him.

Exercise 5 *Is InFrontOf reflexive?*

Multiple Choice:

   (a) *Yes*

   (b) *No* ✓

Feedback (attempt):   *(person1, person1) cannot be in InFrontOf, since a person cannot be standing in front of himself or herself.*

Exercise 6 *Is InFrontOf symmetric?*

Multiple Choice:

   (a) *Yes*

   (b) *No* ✓

Feedback (attempt):   *If (person1, person2) is in InFrontOf, then person1 was standing in front of person2. In that case, person2 was not standing in front of person1 and (person2, person1) is not in InFrontOf.*

Exercise 7 *Is InFrontOf transitive?*

Multiple Choice:

(a) Yes ✓

(b) No

Feedback (attempt): If (person1, person2) is in Sibling and (person2, person3) is in InFrontOf, then person1 was standing in front of person2, and person2 was standing in front of person3. Therefore, person1 is standing in front of person3 and (person1, person3) is in InFrontOf.

Exercise 8 *How many solutions are there to the following statement?*

(**Martin** , PERSON) ∈ InFrontOf

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Feedback (attempt): Only Erin and Victoria are standing in front of Martin.