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## ASSIGNMENT 2

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Part 1:

### 1. Family Problems

#### 1.1 MotherOf (mother, person):

$A(\text{person}) \wedge E(\text{mother}) \wedge \text{MotherOf}(\text{mother}, \text{person})$  iff  $\text{Female}(\text{mother})$  and  $\text{ChildOf}(\text{person}, \text{mother})$ .

#### 1.2 SisterOf (sister, person):

$A(\text{sister}) \wedge A(\text{person}) \wedge E(x) \wedge \text{SisterOf}(\text{sister}, \text{person})$  iff  $\text{Female}(\text{sister})$  and  $\text{ChildOf}(\text{sister}, x)$  and  $\text{ChildOf}(\text{person}, x)$ .

### 2. Tree problem

#### 2.1 SuperNodeOf (x, y):

$A(x) \wedge A(y) \wedge E(a) \wedge \text{SuperNodeOf}(x, y)$  iff  $\text{ParentOf}(x, y)$  or  $(\text{ParentOf}(x, a) \wedge \text{SuperNodeOf}(a, y))$ .

#### 2.2 InSameTree (x, y):

$A(x) \wedge A(y) \wedge E(a) \wedge \text{InSameTree}(x, y)$  iff  $(x=y)$  or  $(\text{SuperNodeOf}(x, y) \vee \text{SuperNodeOf}(y, x) \vee (\text{SuperNodeOf}(a, x) \wedge \text{SuperNodeOf}(a, y)))$