# Project 3

1. The propositional logic of the Guess Who? game consists of two domains: people and traits. Any individual proposition takes the form: Person X does (or does not) have Trait Y. As a result, the description of the logic is a list of people and a list of traits. For each proposition to evaluate to a Boolean value, categorical traits will have to be converted to Boolean categories, by making a new Boolean column to represent each unique trait within the categorical column. The resulting set of uniquely Boolean traits makes up the other half of the propositional logic. If you combine both components of the logic domain, you can construct a truth table representative of the knowledgebase of the game.

List of People:

* ALEX
* ALFRED
* ANITA
* ANNE
* BERNARD
* BILL
* CHARLES
* CLAIRE
* DAVID
* ERIC
* FRANS
* GEORGE
* HERMAN
* JOE
* MARIA
* MAX
* PAUL
* PETER
* PHILIP
* RICHARD
* ROBERT
* SAM
* SUSAN
* TOM

List of Traits:

* NAME
* IS\_MALE
* IS\_FEMALE
* BLACK\_HAIR
* RED\_HAIR
* WHITE\_HAIR
* BROWN\_HAIR
* BLONDE\_HAIR
* BALD
* HAT
* BLUE\_EYES
* BROWN\_EYES
* MUSTACHE
* BEARD GLASSES
* EARRINGS

Truth Table:



## Relationships Expressed in Propositional Logic

* Spouse
  + Spousex,y iff there is a Childx,y
* Sibling
  + Siblingx,y iff Parentsx = Parentsy
* Sister
  + Sisterx,y iff Siblingx,y & Femalex
* Brother
  + Brotherx,y iff Siblingx,y & Malex
* Niece
  + Niecex,y iff there is some Z such that Parentz,x = Siblingz,y & Femalex
* Nephew
  + Nephewx,y iff there is some Z such that Parentz,x = Siblingz,y & Malex
* Cousin
  + Cousinx,y iff there is some Z1&Z2 such that Sibling­­­Z1,Z2 & ParentZ1,X & ParentZ2,Y
* Parent
  + Parentx,y iff Childx,y
* Mother
  + Motherx,y iff Parentx,y & Femalex
* Father
  + Fatherx,y iff Parentx,y & Malex
* Grandparent
  + Grandparentx,y iff there is some Z such that Childz,x = Parentz,y
* Grandfather
  + Grandfatherx,y iff Grandparentx,y & Malex
* Grandmother
  + Grandmotherx,y iff Grandparentx,y & Femalex
* Great-Grandparent
  + Grandparentx,y iff there is some Z such that Childz,x = Grandparentz,y
* Great-Grandmother
  + Great-Grandmotherx,y iff Great-Grandparentx,y & Femalex
* Great-Grandfather
  + Great-Grandfatherx,y iff Great-Grandparentx,y & Malex