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EPBI 414 HW 3

**Part 1**

1. Predicate with 4 parts: <PERSON> from <STATE> likes to eat <FOOD> for <MEAL>.
   1. James, Georgia, Peaches, Breakfast
      1. James from Georgia likes to eat peaches for breakfast
   2. Angel, Tennessee, Broccoli, Snacktime
      1. Angel from Tennessee likes to eat broccoli for snacktime.
   3. Billy, Louisiana, Pizza, Lunch
      1. Billy from Louisiana likes to eat pizza for lunch.
   4. Emmanuel, Washington, Curry, Dinner
      1. Emmanuel from Washington likes to eat curry for dinner.
2. 3 constraints and then rewritten
   1. Age must be between 18 and 49 🡪{17<age<50}
      1. Age {18,19, … 48,49}
   2. Income must be a positive number or 0🡪 income>=0
      1. Year {0…}
   3. Expenses must be a negative number or 0 🡪 expenses < 0
      1. Income {-…0}
3. 2 examples of each type of relationship
   1. One-to-one
      1. Capitol to state
      2. Representative to district
   2. One-to-many
      1. Car to passenger
      2. Mother to children
   3. Many-to-many
      1. Degree types to universities
      2. Patients and diagnoses
4. Considering the following 3 relations (see attached Relations.xls if needed)
   1. Primary key for each
      1. Doctors: Doc\_ID number
      2. Patients: Pt\_ID number
      3. Visits:Vt\_ ID number
   2. Foreign Keys
      1. For patient: Pt\_Phys
         1. This is the ID number for the doctor (Doc\_ID)
      2. Visit: Vt\_Doc and Vt\_Pt
         1. These ID #s refer back to Doc\_ID and Pt\_ID respectively
   3. Type of relationships
      1. One-to-many
      2. Many-to-many
5. SSOT
   1. Describe: SSOT tries to keep databases from re-entering data more times and thus making it more cumbersome to check or change. The more times you enter it, the more likely there will be an error. Once you find an error it is also hard to decide which spot is an error and which is correct and you have to check all of them.
   2. Design: Whenever making a database, only record meaningful data once. If you need to use that data for something else, reference it with a number or other identifier, but do not re-enter it.
6. Examples of violations of NF
   1. 1NF violation: A table of mothers with a column for each child
      1. Assuming the mothers don’t all have the same number of children, some will have more columns than others
   2. 2NF violation but ok 1NF: a table for days off that has a primary key of employee names, then has fields of their phone number, the first day off, and number of days off
      1. The phone number will be the same for each case for the same employee for every time they take a day off
   3. 3NF violation but ok 2NF: record with primary key of student, then has fields of major, university, and location (this references the city of the university)
      1. All of the fields should reference the key field(s) and the location of the university refers to another non-key field

**Part 2:**

See attached