COMP 1100 Homework 06 – Normalization

Name	Date

1. Consider the following relation:

   Results(DriverName, CarId, Manufacturer, RacingTeam, RaceName, TrackName, StartPosition, FinalPosition)

   Each tuple in this relation contains information about a car in an auto racing event. DriverName identifies a unique driver. RacingTeam identifies the name of a unique racing team. RaceName uniquely identifies a particular racing event and TrackName uniquely identifies a particular racing course. CarId uniquely identifies a particular car. Manufacturer indicates the company that manufactured the car, and StartPosition and FinalPosition indicate what place the car started at in the race and where it finished.

   Write each of the following dependencies as a functional dependency. Assume each dependency is independent of the others (i.e. don't assume that what you write for (a) carries over into the rest of the list).

   a. Each car is owned by a single racing team, but one racing team can own multiple cars

   b. Each race is held at a single track, but a single track can host multiple different races

   c. For each individual race, each car has a single driver, single start position and a single final position

   d. For each individual race, each start position can have only a single car

   e. For each individual race, each driver races for exactly one racing team

2. Based on the Patient Bill below:
    a. create an initial set of relations.
    b. Then either argue why your relations are all in first normal form, or create a set of new relations based on these that are in first normal form.
    c. Then repeat step (b) for second normal form
    d. Then repeat step (b) for third normal form.

Patient bill						
Patient #: 12345			Date: 7/20/08			
Patient Name: Mary Baker			Date admitted: 7/14/08			
Patient Address: 300 Oak Street			Discharge date: 7/17/08			
City-State-Zip: Boulder, CO 80638						
Cost Center	Cost Name	Date Charged	Item Code	Desc	Charge	Bal Due
100	Room & Board	7/14/08	2000	Semi-prv room	200.00	
		7/14/08	2005	Television	5.00	
		7/15/08	2000	Semi-prv room	200.00	
		7/16/08	2000	semi-prv room	200.00	
				Subtotal		605.00
110	Laboratory	7/14/08	1580	Glucose	25.00	
		7/15/08	1585	Culture	20.00	
				Subtotal		45.00
125	Radiology	7/15/08	3010	X-ray chest	30.00	
				Subtotal		30.00
				Balance due		680.00