Fitchburg State University
CSC7500 Database Design
Fall 2017
Midterm Exam

Submit both problems either through LucidChart or as a PDF. If you use LucidChart, submit the link.

1. Boundless Bagel Bakers, a mail-order baking company, has hired you to develop its database management system. After several meetings with the management of BBB, you have come up with the following set of entities and attributes:

CUSTOMER
- CustomerNumber
- LastName
- FirstName
- Address
  - Street
  - City
  - State
  - ZipCode
- HomeTelephone
- OfficeTelephone

ACCOUNT
- AccountNumber
- CreditLimit
- CurrentBalance

SALESPERSON
- SalesPersonID
- LastName
- FirstName
- CommissionRate
- DateOfHire
- DateOfBirth

BAKERY
- BakeryID
- Location
  - City
  - State
- ProductsBaked

PRODUCT
- ProductCode
- ProductDescription
- Price

INGREDIENT
- IngredientID
- Description
- SupplierID
- StandardMeasure

SUPPLIER
- SupplierID
- Address
  - Street
  - City
  - State
  - ZipCode

In addition to the above set of entities and attributes, you have determined the following set of business rules:

a. A bakery can bake one or more products but must bake at least one product.
b. A product consists of one or more ingredients that are used in a certain quantity.
c. A customer can have one or more accounts. An account is for one customer only.
d. Ingredients are supplied by one or more suppliers. A supplier may supply one or more ingredients or may supply no ingredients at all.
e. Customers order products from one bakery and the order is placed using a salesperson.
f. The customer's order is charged to his or her account.
g. A salesperson works for only one bakery and a bakery employees many salespeople.
h. Each bakery bakes only certain products. Some bakeries may bake all products.

Using the entities and attributes defined above as well as the business rules, create an ERD.

2. Consider the following relation:

Bank_ID	Branch_ID	Branch_Address	Branch_City	Branch_State	Branch_ZipCode	Bank_City	BranchManagerID

BranchManager Name	Cust_ID	Cust_Name	Application _ID	Application _Date	Amount_Requested	AppStatus

Consider this to be all one relation. I've put it on two lines to make it all fit.

1. Identify the primary key(s). Are there any other candidate keys (fields that could be considered in choosing a primary key?)
2. Identify the partial functional and transitive dependencies. You can either show these with arrows on the diagram or write them out.
3. Convert the relation into a set of third normal form relations
4. Extra Credit (If you have time) Convert the relations to an ERD