APRIL 26, 2017

ASSIGNMENT 6

DATA & NETWORK DESIGN

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CIS 341

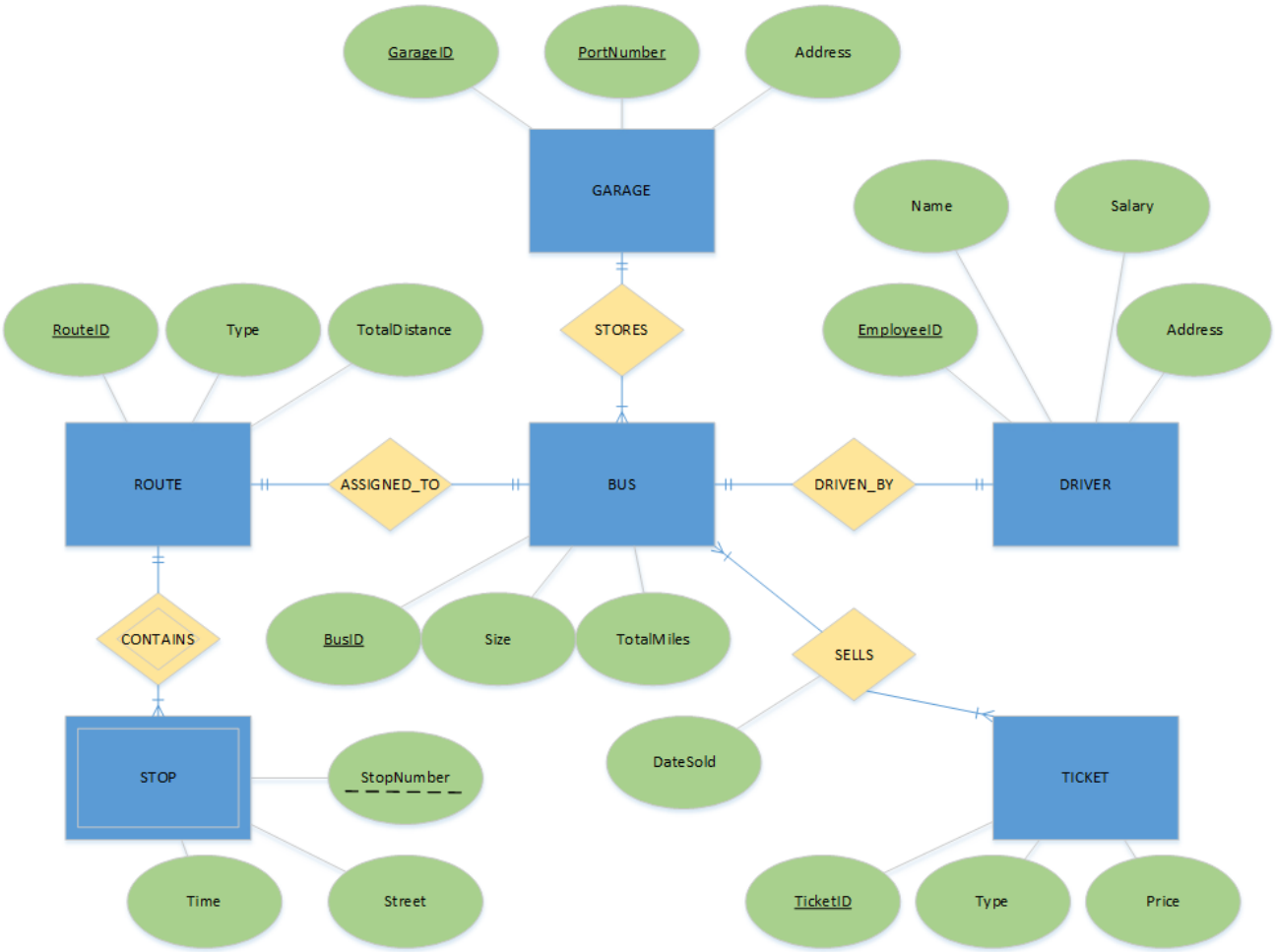
Assignment 6 – Data and Network Design

1 Winfield Public Transit Authority

Winfield is a small city with a population of 22,000. Until now, Winfield was served by a bus route from a nearby city. The Winfield City Council has held a bond sale to fund the purchase of several buses to serve three routes in Winfield and neighboring areas. As the city's IT director, you have been asked to set up an information system for the new Transportation Authority. Assume that multiple buses will run on each route.

Tasks

1. **Draw an ERD for the Winfield Public Transit Authority system.**
   a. **Indicate cardinality - by indicating the crow-foot notation.**



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b. Identify any primary keys and 1 to many or 1 to one relationships

Table Name	Primary Key
ROUTE	RouteID
STOP	RouteID, StopNumber
GARAGE	GarageID, PortNumber
BUS	BusID
SELLS	BusID, TicketID
TICKET	TicketID
DRIVER	EmployeeID

Table 1	Table 2	Relationship
ROUTE	STOP	1:M
ROUTE	BUS	1:1
BUS	DRIVER	1:1
GARAGE	BUS	1:M

c. Identify at least 3 attributes for each entity.
d. Create 3NF table design (Design the tables with no repeating groups.)

ROUTE(RouteID, Type, TotalDistance, CurrentStop*)
STOP(RouteID, StopNumber, Street, Time)
GARAGE(GarageID, PortNumber, Address)
BUS(BusID, Size, TotalMiles, AssignedDriver*, AssignedRoute*)
SELLS(BusID*, TicketID*, DateSold)
TICKET(TicketID, Type, Price)
DRIVER(EmployeeID, Name, Address, Salary)

Key:
__ = Primary Key

* = Foreign Key

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2 Working Shoes

Working Shoes is a multistate shoe store that offers an extensive selection of casual and dress shoes designed for men and women who work on their feet. Working Shoes plans to launch a new Web site, and the company wants to develop a new set of product codes. Currently, 250 different products exist, with the possibility of adding more in the future. Shoes and many accessories come in various sizes, styles, and colors. The marketing manager asked you to develop an individualized product code that can identify a specific item and its characteristics.

Tasks

1. **Design a code scheme that will meet the marketing manager's stated requirements for at least 10 examples.**

Item	***Product Code***
Nike, Roshe One, Grey/White, Size 10 Men	*010-133-2422-10M*
Nike, Roshe One, Pink/Yellow, Size 6 Women	*010-133-2310-06W*
Nike, Air Woven, White, Size 6 Women	*010-076-0001-06W*
Nike, Air Force 1 UltraForce, Black, Size 8 Men	*010-221-0009-08M*
Converse, Chuck Taylor's All Star High, Navy Blue, Size 9 Women	*122-001-0032-09W*
New Balance, Sure Grip, Black, Size 14 Men	*050-037-0009-14M*
Sketchers, Work Hobbes, Black, Size 10 Women	*100-021-0009-10W*
Reebok, Sublite Steel Toe, Orange/Grey, Size 7 Men	*091-010-4231-07M*
Reebok, Kenoy Steel Toe, Black/Grey, Size 11 Men	*091-011-0924-11M*
New Balance, Sure Grip, Grey/Pink, Size 9 Women	*050-037-2423-09W*

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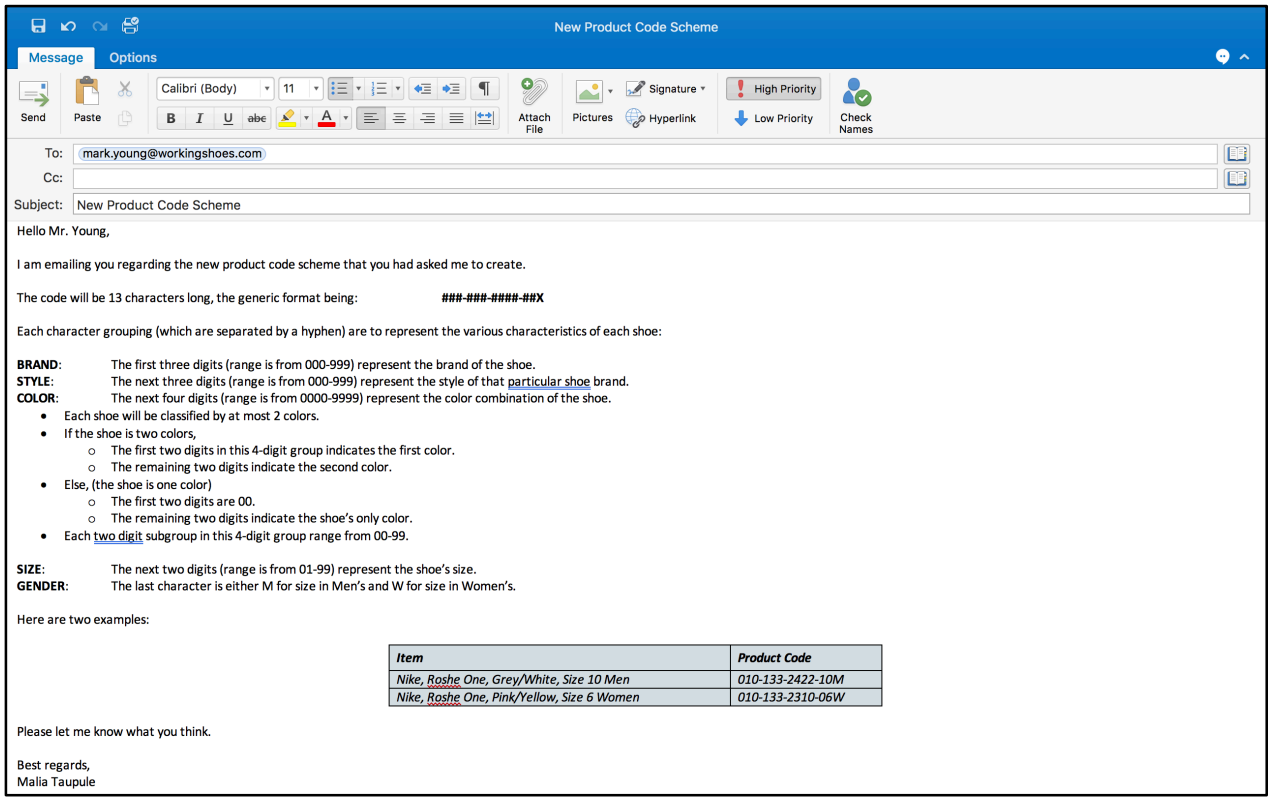
2. **Write a brief memo/email is fine to the marketing manager suggesting code proposed, and state your reasons.**



New Product Code Scheme

Message Options

Send Paste Calibri (Body) 11 Attach File Pictures Signature Hyperlink High Priority Low Priority Check Names

To: mark.young@workingshoes.com

Cc:

Subject: New Product Code Scheme

Hello Mr. Young,

I am emailing you regarding the new product code scheme that you had asked me to create.

The code will be 13 characters long, the generic format being: **###-###-#####-##X**

Each character grouping (which are separated by a hyphen) are to represent the various characteristics of each shoe:

BRAND: The first three digits (range is from 000-999) represent the brand of the shoe.
STYLE: The next three digits (range is from 000-999) represent the style of that particular shoe brand.
COLOR: The next four digits (range is from 0000-9999) represent the color combination of the shoe.

- Each shoe will be classified by at most 2 colors.
- If the shoe is two colors,
  - The first two digits in this 4-digit group indicates the first color.
  - The remaining two digits indicate the second color.
- Else, (the shoe is one color)
  - The first two digits are 00.
  - The remaining two digits indicate the shoe's only color.
- Each two digit subgroup in this 4-digit group range from 00-99.

SIZE: The next two digits (range is from 01-99) represent the shoe's size.
GENDER: The last character is either M for size in Men's and W for size in Women's.

Here are two examples:

Item	*Product Code*
Nike, Roshe One, Grey/White, Size 10 Men	*010-133-2422-10M*
Nike, Roshe One, Pink/Yellow, Size 6 Women	*010-133-2310-06W*

Please let me know what you think.

Best regards,
Malia Taupule

3. **Create a 2nd code scheme that will identify each specific order. Consider using the date or type of transaction such as web or in store purchases.**

Product Code format: ######X-###-###-####-##Y

Code grouping details:

DATE: First 6 digits indicate date: MMDDYY
ORDER TYPE: O for online and P for in person
BRAND: 3-digit code for the shoe brand
STYLE: 3-digit code for the style of that particular shoe brand
COLOR: 4-digit code indicating the color combination of the shoe (see email for specifics)
SIZE: 2-digit representation of the shoe's size
GENDER: M for size in men and W for size in women

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3 Data Design Terms

Briefly define the following terms (use 2-3 sentences) in your own words:

Term	***Definition***
Attribute	*A specific property or characteristic of an entity.*
Entity	*A defining object specific to the entire database or system. An entity could either represent something physical or something abstract.*
JDBC	*(Java DataBase Connectivity); an API that connects programs written in the Java programming language to the data in a database.*
Primary Key	*A column or combination of columns that uniquely identify each row of a table (or each instance of an entity).*
Referential integrity	*An ERD constraint requires the relationships between entities/tables to be consistent; consistent being that each foreign key(s) must refer to a primary key(s) in the same or different table.*

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4 Network Design Terms

Briefly define the following terms (use 2-3 sentences) in your own words:

Term	***Definition***
802.11	*A family of specifications for wireless local area networks (WLANs); better known as the specifications for Wi-Fi*
Point of Sale	*When a sales transaction takes place; Software commonly used by retailers to maintain their inventory records which are updated each sales transaction that takes place.*
roaming	*A term that refers to a cellular customer's ability to use cellular services even when traveling beyond the customer's geographical coverage of the home network, by means of using a visited network.*
Network router	*A device that forwards data packets between computer networks; the device that connects a local network to an outside network.*
Network switch	*A device that connects devices together on a computer network to create a local network; to connect to the internet a switch must be connected to an access point (i.e. a first hop router that connects to an internet service provider).*