Assignment 3:
Database Design and Microsoft Access

Due Date: Friday, October 18 by 6:00 pm.
Late Policy: This assignment will be accepted up to one (1) day late.
Assignments submitted after Oct 18 at 6:00 PM but before Oct 19 at 6:00 AM
will be deducted 10% of the total grade.
Assignments submitted after Oct 19 at 6:00 AM but before Oct 19 at 6:00 PM
will be deducted 25% of the total grade.
Assignments submission will be closed at 6:00 PM on Oct 19
and no assignments can be submitted to OWL after that time.

Project 1: Correct and Re-Submit your E-R Diagram

You **MUST** submit a copy of your **CORRECTED** Assignment Two E-R Diagram as part of Assignment Three. This means you **must** re-do your Project One (E-R Diagram) from Assignment Two.

EVEN IF you received an 86 out 86 marks on Project One of Assignment Two, you still **MUST** submit your E-R Diagram based on the marking sheet with the rest of Assignment Three. (Yes, even if you earned an 86/86 you MUST still submit the ER Diagram.)

YOU <u>MUST</u> USE YOUR CORRECTED E-R DIAGRAM BASED ON WHAT YOU SUBMITTED IN ASSIGNMENT TWO.

Only a correct ER Diagram will produce the database below. The database MUST match the specifications below.

YOUR DATABASE IN PROJECT 2 OF ASSIGNMENT THREE WILL BE COMPARED TO YOUR CORRECTED E-R DIAGRAM.

BUT! You **MUST** correct your E-R Diagram to the specifications in the Assignment Two.

Your database **MUST** meet the requirements and the tables and fields below. So, if your E-R Diagram was wrong or incomplete, you **MUST** re-do and re-submit the diagram for this assignment.

You **MUST** submit a corrected ERD to show these changes.
HINT: You can use the specifications below to 'reverse engineer' the E-R Diagram.

The database must have all the tables that were in your Assignment Two design.
 - hint, there should be five (5) tables in your database because you were told there were five entities in your ERD.

The fields will match the E-R Diagram attributes as provided in the Assignment Two (2).
The database properties for those supplied attributes from Assignment Two are given below.

 - if the field was a <u>primary key</u>, then it must be set as a primary key in the table.
 - if a field was <u>nullable</u> in the ERD then the data in the corresponding field in the database must be nullable.
 - if a field was <u>unique</u> in your E-R Diagram, then the field must be set to be unique in the database.

Follow the examples covered in class. Everything required to complete this assignment has been covered extensively (and very well) in class. Just follow those same simple steps.

If you do NOT submit the corrected E-R Diagram (with your name in the diagram as required in Assignment Two) in this assignment you will receive a **zero (0)** for Project One of Assignment Three.

The marking for Project 1 is ALL or NOTHING.
The re-submitted E-R Diagram MUST match the database you will submit for Project Two of Assignment Three as described below.

SO! Three (3) of your five (5) entities must be: CUSTOMER, SERVICE and INVOICE.
The entities MUST have the attributes that match exactly the converted field names described in Project Two below.

Project 2: Create a Microsoft Access database

Using Microsoft Access, create a database based on <u>your</u> E-R diagram from **Assignment 2**.

The Entity-Relationship Diagram (ERD) is the model or 'blueprint' that is used to create a database. For Assignment Three, you will take the requirements of the E-R diagram from Assignment Two and use that to create a database using MS Access.

You are required to use the attributes and the relationships of the E-R Diagram from Assignment Two. This includes the correct use of the Primary and Foreign keys and their correct properties in the MS Access database.

PART 1:

   a) Create a new table called "**CUSTOMER**" information using the following specifications:

      1) Unique **Customer ID** that automatically created when a new item is entered
            note: this ID must start with <u>**YOUR**</u> initials:
                  so – if your name is **D**olly **M**adision – every customer ID would start with DM
                  example: DM0001, where "DM" are YOUR initials
                            DM0002, where "DM" are YOUR initials
                            DM0004, where "DM" are YOUR initials
                            DM0007, where "DM" are YOUR initials
             hint: **MUST** be **2** initials and **four** digits (see examples above)
                must use Autonumber (Long Integer)
                must use the **Format** Field Property to accomplish this
             hint: if you do not know how to do this, a simple internet search will provide
                  the answer …

          NOTE: - <u>very important</u>:
                  if the Customer ID is used as a Foreign Key in another table:
                    - that key must be of type **Long Integer**
                    - the value entered will just be the number:

example: the *foreign key* is **1** where the Customer ID is **DM0001**

the *foreign key* is **2** where the Customer ID is **DM0002**

the *foreign key* is **4** where the Customer ID is **DM0004**

the *foreign key* is **7** where the Customer ID is **DM0007**

2) **Customer's Last Name** - maximum 40 characters

3) **Customer's First Name** - maximum 30 characters

4) **Customer's Street Address** - maximum 30 characters

5) **Customer's City** - maximum 30 characters

6) **Customer's Province** - 2 characters exactly
   display in all capital letters (i.e. ON or AB etc.)
   hint: use the **Input Mask** Field Property

7) **Customer's Postal Code** - 7 characters exactly
   format: A1B 2C3 (L9L L9L - L: letter 9: number)
   hint: use the **Input Mask** Field Property

8) **Customer's Phone Number** - maximum 10 characters
   stored as: 5195552323   (no brackets or dashes)

9) **Customer's Payment Method (Credit Card)**
   Credit Card (Yes/True) -or- Cheque [i.e not Credit Card] (No/False)
   indicates CREDIT CARD (yes or true) or CHEQUE (no or false).
   (hint: is there a data type that allows ONLY a yes –or- no value?)

b) Create a new table called "**SERVICE**" information using the following specifications:

1) Unique **Service ID** that is <u>NOT</u> automatically created when a new item is entered
   note: this ID must start with **ANY** alphabetic character followed by 4 digits:
   the letter MUST be a capital letter
   example: K9345
         F0302
         X3000
         F0022

   example: L9999 – where L means a capital letter and 9 means a number
         - use the **input mask** Field Property

   NOTE: - <u>very important</u>:
         if the Service ID is used as a Foreign Key in another table:
         - that key must be of type Text (String)
         - the value entered will just be the letter and the number

   example: *Foreign key* will be **K3433** where the Service ID is **K3433**

2) **Service Name** - maximum 150 Characters

3) **Service Classification** - maximum 70 characters
(i.e. consulting, delivering, processing, etc.)

4) **Service Retail Cost** – stored as currency

5) **Service Method** - stored as one of three values: 'Personal, 'Group or 'Both
("but my Service does not actually use the concept of personal service or group ???"
That's fine, don't worry about it. Use this anyway.
This field MUST be filled with only Personal, Group or Both)

6) **Service Customer Classification** – stored as a text.
- remember – the field must store only one of:
New Customer, Repeat Customer or Service Customer)

c) Create a new table called "**INVOICE**" information using the following specifications:

1) Unique **INVOICE ID** that is <u>NOT</u> automatically created when a new item is entered
note: this ID is made up of numbers only, but can start with leading zeroes (000):

example: 6567
0037
100200

note: make this a reasonable maximum length (less than 10).

2) **Invoice Date**:
Date (short format) when this invoice was created.

3) **Invoice Total** – NOT stored as currency
- stored as a number with two (2) decimal places

4) **Invoice Status** – stored as one of three text values: 'New', 'Waiting' or 'Paid'

ALSO: You **MUST** include any other tables and fields in your ERD
hint: foreign keys and connector tables.

PART 2: REFERENTIAL INTEGRITY

You **must** build all the relationships described in your diagram. You must use the **Relationships Database Tool** in MS Access to enforce the relationships as demonstrated in class.

You must fill in the tables with example data of at least **four (4)** records for each and every table.

Your **name** must be the name of the second **Customer**.

You are allowed to make up the names of the other Customers, as well as the SERVICEs
The SERVICES should be created to appear valid and should make sense in the context of your other data.

Complete the above as required saving the database in your "Service" database.
    i.e *youraccountname*_Service.accdb (or .mdb for earlier versions)

PART 3: NORMALIZATION

Normalization is the process of structuring a relational database in order to reduce data redundancy and improve data integrity.

The database created to the specifications above in part 1 contains three (3) fields in two (2) separate tables that need to be normalized.

Create an MS Word document and complete the following question pertaining to the database you created in Part 1 above.

    1.) Identify the two tables and the field(s) in each table that needs to be normalized.
       (for example:
          table: CUSTOMER – field: Province) - note – this is NOT the correct answer!
       hint: it is NOT in the CUSTOMER table.

That is it. You do NOT have to actually change or Normalize the actual database.
Just identify (write in your MS Word document) the tables and fields that need to be Normalized.

Yes, that means you will submit the MS Access database exactly as specified and exactly as you designed in your E-R design.

Yes, this means you do NOT change, add tables or edit in any way, the database you created for Project 2 – Part 1.

Yes, you are only being asked to identify (name) the fields and the tables that would require change. You do NOT actually make these changes.

You will put this written answer into the same document that you will use to complete Project Three (3) below.

This means you only need to submit one (1) and only one (1) MS word document.

This document will contain your answers to Project 2 - Part Three **AND** your answers to Project 3.

Yes, this means you add the two parts together into one document (Project 2 – Part 3 AND Project 3). You put both into one and only one document.
Yes, this means you do NOT submit two MS Word documents, only **one** MS Word document.

Project 3: Information Systems Questions about Your Company

In the same MS Word document you created for Project 2 – Part Three above, complete the following questions pertaining to the business you described in Assignment One (1).

Each answer must be comprehensive (more than one sentence). Each answer requires at least a couple of sentences. (i.e. what is being graded is the quality of your answer, not the quantity. 'Brevity is the soul of wit'. It is expected that some thought and explanation is included in this section. BUT, an intelligent answer is required. If you just type in something just to complete the assignment, then your grade will reflect the amount of effort and thought you put into each answer.)

1.) Identify any one collection of data you think would help your business at this point. For example (and you cannot use these, obviously), you will need a list of potential customers so that you will have a target for your advertising. You will probably also need a list of you competitors so you can understand your market better. Identify and describe why you would need the specific data collection you have chosen to write about in this assignment, for your business.

2.) Describe any important decision that you have made in the past year and briefly describe your process for selection the choice you did. This is any decision of consequence. (examples (that you cannot use) why Western for university? or why the brand of running shoes, etc. It is not expected to be business related, but some choice you personally decided on.

The format of this document should be identical to format you used in Assignment One (1).
Place your name, followed by the company name at the top.
Fill in the required information after.

At the end of the document, include your name, Student number and Western ID (the first part of your Western email (i.e. if your email is – **ibrai2328@uwo.ca** your ID will be – **ibrai2328**)

Formatting is not important as long as the document is easy to follow:

This document must be a Word file saved and submitted as a .doc (or .docx) file
The name must be a combination of your Western Account Name and the name of your company.
The file name must be youraccountname_companyname_A3.doc (or .docx)
  - example (from above)   **ibrai2328_MaggicSoftware_A3.docx**

Submission Instructions:

You must **upload and submit**, via the Assignment Section in the CS1032 Web Site,
ALL of the following **three (3)** files:

youraccountname_CORRECTED_ER_Diagram.dia
youraccountname_Service.accdb (or .mdb for earlier versions)
youraccountname_*yourcompanyname*_A3.docx (or .doc for earlier versions)

The corrected Entity-Relationship Diagram must follow the standard of Assignment Two.
  - it MUST be a .dia file
  - it MUST have your name, Western UserName <u>and</u> Western Student Number in the diagram.

It is your responsibility to ensure the files have been submitted in OWL.
Please check and make sure you have received the confirming email and then check that the three (3) files (you must submit **three (3) Files** for this assignment) have been uploaded correctly.

You must do all three Projects in this assignment. This is Assignment Three, comprised of three (3) projects, Project 1, Project 2 and Project 3.

ALL projects are to be completed and submitted. There was confusion on Assignment One and Assignment Two regarding what was required.

NOTE: 'I did achieve a perfect 86 out of 86 on my Assignment Two E-R Diagram. Should I submit
          an E-R Diagram anyway, even though it was perfect and did not need corrections?'

ANSWER: YES!! To make sure you do not get deducted for not
            submitting three files, you must submit the ERD.

Remember: Do your own work. You will need to know how to perform these tasks on the exam.

Remember: youraccountname is the part of your UWO email that is before (to the left of) the @ sign.
    example:
          IF email is: ibrai2328@uwo.ca
          THEN youraccountname is: ibrai2328

START NOW ! – Although this is very doable, it is not a trivial task.
                GIVE YOURSELF ENOUGH TIME !

… and finally – REMEMBER to use the correct email specifications
                (review the Course Outline and/or the three reminders in the Announcements)

Good luck and have fun with this…