

### Functional Dependencies

The concept of functional dependencies is the basis for the first three normal forms. A column, Y, of the relational table R is said to be **functionally dependent** upon column X of R if and only if each value of X in R is associated with precisely one value of Y at any given time. X and Y may be composite. Saying that column Y is functionally dependent upon X is the same as saying the values of column X identify the values of column Y. If column X is a primary key, then all columns in the relational table R must be functionally dependent upon X.

### PURPOSE

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Finish your project by creating your database in Oracle using APEX.

### CONCEPTS

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Oracle Application Express (Oracle APEX), is the low code web application development tool for the Oracle database. Application Express enables you to design, develop and deploy beautiful, responsive, database-driven applications, either on-premises or in the cloud. Using only a web browser and limited programming experience, you can rapidly develop and deploy professional applications that are both fast and secure for any device from desktop to mobile. Oracle Application Express combines the qualities of a low code tool such as productivity, ease of use, and flexibility, with the qualities of an enterprise development tool such as security, integrity, scalability, availability and built for the web.<sup>1</sup>

### INSTRUCTIONS

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In the APEX environment created for your group and using the SQL Workshop and the Application Builder, you will create your database, populate your database tables, and create the eight reports required of your project. Here are some of the rules.

- You will name your application the name given to your database. e.g. Dog Walker, Three Wheeled Deliveries, Bicycle Rental and so on.
- You may not change any login information once set. If I cannot log on, you will get zero points for the project.
- Your homepage will have a summarized description of your database, who it is for, what it is for, what it does, how it benefits the user(s), how it works and so on.
- Your homepage will list the names of the team members. No other member information, just names.
- Your homepage will have links to each of your eight reports Defined in Milestone 2 supporting documents. These could be buttons, tabs, hyperlinks and so on. Make sure each report is properly named. Most were given names in the supplemental data given to you last week.
- You will create forms necessary to input data into your database at runtime. The number of forms may vary by project. I will however put the cap on four forms maximum.

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<sup>1</sup> Quoted from: <http://www.oracle.com/technetwork/testcontent/what-is-apex-099128.html>

- You must populate each table with enough data so to popular your reports in a way they look full and interesting. At a minimum do the dozens; a dozen of everything. Remember my grading starts at 70% for average/minimum.
- A page with your well formatted and well written glossary.

## DELIVERABLES

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Assemble the following deliverables in electronic form as noted:

- Your DDL and DML. Your code must be well formatted and commented. I suggest you use the Generate Database tool in DeZine for Databases. If you follow the style produced by that tool you will have a good start.
- In a (one) well formatted PDF document containing:
  - A cover page with
    - Database name
    - Team member names
    - Date
    - Course
    - Hyperlink, Username and Password to your APEX database<sup>2</sup>
  - Table of Contents
  - Summary (same one in your application)
  - Your final ERD
  - Screen shots of your application home page and each report and form.
  - Your DDL and DML in well formatted and commented style.
  - Glossary (same one in your application)
- You final ERD

Make sure all active and participating members of your group are listed on the cover page. If someone didn't participate, leave the name off.

This is not a time to get sloppy. Make this look report look good. All other professors will be reviewing this work in preparation of senior project team

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<sup>2</sup> The login page for your running application will have a URL that looks something like this: <https://iacademy3.oracle.com/ords3/f?p=12465:1:16503116659916:::>

You will have your link as well as Username and Password on the cover page of your PDF. Make certain the link works when clicked on in the PDF. If it doesn't work your application will not be graded. Make sure the Username and Password works as well. If they don't work your application will not be graded.

assignments for next year. They will have access to your APEX application as well. Now is the time to step it up and show real effort and talent.

Formatting and style along with correctness hold high marks in your presentation. Pay close attention to details. This is your final document and I am looking for crisp, clean, sharp, snappy, well formatted reports.

The application and all supporting files are due no later than 10:00am on Tuesday, June 12<sup>th</sup>. An electronic copy of your final DeZine for Databases ERD, your DDL and DML and final report PDF is also due at that time turned into your folder on the CIS Transfer Drive (refer to the FileZilla document).

### A REMINDER AND FINAL NOTE

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What was described above is the minimum and if 100% correct is still only a 70%. Remember, my grading rubric is very simple and very subjective. Sure, I will grade your work with an even eye seeing if you did in fact do the minimum. But that minimum still needs to be 100% correct. In my experience I have found most students on the average do just that, the average, and expect high marks for that little effort. Not on my watch. If you want a higher grade, then you need to raise to a higher level of performance. Excellent and outstanding students don't do average work. Those who fit the model of excellent and outstanding will be graded to that level if their work meets that criteria.

APEX as you will see is a very powerful tool and there are a great many things you can do in it in a short period of time to really dress up and show off your application. Step it up and impress me with that which I feel you can do if you set your mind to the task. Make your PDF report look like something from a Fortune 500 company board meeting.

### SUPPORTING HELP FOR YOUR DATA

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Besides the DDL and DML file examples I will provide to help you populate your database, here are a couple of helpful tools.

You might find the following web site helpful for generating names: <http://random-name-generator.info/>

In Microsoft Excel, the following function is useful for generating random dates and numbers. This example generates random dates.

Function Arguments

RANDBETWEEN

Bottom (DATE(2016,1,1)) = 42370

Top (DATE(2016,1,31)) = 42400

= Volatile

Returns a random number between the numbers you specify.

Top is the largest integer RANDBETWEEN will return.

Formula result = Volatile

[Help on this function](#) OK Cancel