CPRG 307
Lab 3: Basic Program Structures

Student: _____

Mark: ___ / 2 (*one mark for each deliverable*)

Lab Objectives

Here is what you will be able to do when you complete each objective:

- Describe the structure of a programming block.
- Create a programming block.
- Explain data declarations for scalar variables.
- Create data declarations for scalar variables.
- Use the built-in database function to output results to the screen.
- Explain the use of SQL commands in a programming block.
- Modify code to correct syntax errors.
- Create variables that dynamically retrieve the data type from a database column.
- Use composite data types.

Lab Instructions

To complete this lab, follow the steps below. This lab is due on the day and time indicated by your instructor.

Steps:

☐ 1. ATTEND the lecture on the material that will be performed in the lab exercise.

☐ 2. COMPLETE the out-of-class learning activities as indicated by your instructor.

☐ 3. COMPLETE the prelab tasks identified in the lab document before the lab class, making sure to submit solutions to the appropriate forum and thread in the D2L discussion board.

☐ 4. COMPLETE the tasks identified in the lab document, making sure to submit solutions to the appropriate forum and thread in the D2L discussion board.

☐ 5. COMPLETE the post lab tasks identified in the lab document after the lab has been completed.

Deliverables

☐ 1. SUBMIT the complete and tested prelab code by the date and time indicated by your instructor to the appropriate forum and topic in the D2L discussion board.

☐ 2. SUBMIT the complete and tested lab code by the date and time indicated by your instructor to the appropriate forum and topic in the D2L discussion board.

For this lab, all code should be placed in the body of the discussion board posts – <u>not</u> as an attachment.

Unless stated otherwise, code from <u>all</u> tasks should be included in discussion board posts.

Prelab Tasks

The following questions use the Astra Talent Agency (ATA) table set.

☐ 1. Write the PL/SQL code for the following problem:

Create a PL/SQL block that has the following variables:

v_hiredate (DATE)
v_surname (VARCHAR2(30))
v_firstname (VARCHAR2(30))
k_salary (NUMBER(5,2))

The hire date should have the value January 10, 2013 set in the declare section (do not forget to convert to a date).

Set the surname and first name values to your name in the body of the code (not the declare section).

The salary should be a constant of $100.25.

At the end of your program, display all four variable values to the screen.

☐ 2. Write the PL/SQL code for the following problem:

Retrieve the agent information for agent 0000002 and display this information to the screen after it has been retrieved from the database. Use scalar variables of exact datatypes (no %TYPE) to solve this problem. *Hint: AGENT_ID is a VARCHAR2 datatype, this means the value above, because of the leading zeros, must be placed between single quotes.*

☐ 3. Write the PL/SQL code for the following problem:

Retrieve the agent information for agent 0000002 and display this information to the screen after it has been retrieved from the database. Use scalar variables of %TYPE to solve this problem.

☐ 4. Write the PL/SQL code for the following problem:

Retrieve the agent information for agent 0000002 and display this information to the screen after it has been retrieved from the database. Use a custom record type to solve this problem.

☐ 5. Write the PL/SQL code for the following problem:

Retrieve the agent information for agent 0000002 and display this information to the screen after it has been retrieved from the database. Use %ROWTYPE to solve this problem.

Lab Tasks

The following questions use the EMP table set.

Although you do not have to submit a flowchart or test plan for this lab problem, it is recommended you still create them as this will help you to breakdown and solve the problem. When your instructor posts the solutions for the lab to the discussion board, they will also include the flowchart, test plan, and test code to provide you with examples of the entire problem lifecycle.

☐ 1. CREATE **and** thoroughly test a PL/SQL coded solution for the following problem:

The president of the company wants to ensure that everyone is receiving a "fair" wage. He has asked you to modify salaries of everyone, except him, using the following guidelines (each point uses the salary from the previous step):

- If anyone makes more than the president does, they should have their salaries reduced to 25% less than he makes.
- If anyone makes less than $100, their salary should be increased by 10%, but only if the current average salary for the entire company is still more than their new raised salary.

Restrictions:

- Must use DQL (SELECT) to retrieve data
- Must use DML (INSERT, **UPDATE**, and DELETE) to modify data
- Can choose what variable types to use
- Cannot use any decision or looping structures from Module 4 (this is strictly Module 3 code)
- Cannot use subqueries with DML statements
- Can only hard code information that was provided in the problem
  - 'PRESIDENT'
  - 25%
  - $100
  - 10%
- Hard coded values should be defined as constants and then the constants used in the body of the code
- Can assume the company has only one president

Extra Questions to Practice

Below are extra questions to practice for the material in this module (these are extra to the lab and are for practice only):

☐ 1. Complete the following textbook problem: *Assignment 3-1: Querying data in a block* on page 119-120 of your textbook. If you have questions on the results of this problem, please call your instructor over.

☐ 2. Complete the following textbook problem: *Assignment 3-2: Using a record variable* on page 120-121 of your textbook. If you have questions on the results of this problem, please call your instructor over.

Post Lab Tasks

☐ 1. COMPARE your posted solutions to those posted by your instructor. If you are unsure why there are differences between the solutions, make sure to talk to your instructor.