CPRG 307
Lab 6: Stored Procedures and Functions

Student: _____

Mark: ___ / 3 (*one mark for each deliverable*)

Lab Objectives

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

- Explain the difference between an anonymous block and a named program unit.
- Explain the structure of the CREATE PROCEDURE command.
- Explain the use of parameters in a procedure.
- Use parameters in a procedure to make code reusable.
- Identify syntax errors in a procedure.
- Modify procedure code to correct syntax errors.
- Execute a procedure.
- Explain the difference between a function and a procedure.
- Explain the structure of the CREATE FUNCTION command.
- Use parameters in a function to make code reusable.
- Execute a function.
- Identify syntax errors in a function.
- Modify function code to correct syntax errors.
- Explain the use of the RETURN command in functions and procedures.
- Use the RETURN command in a function.

Lab Instructions

To complete this lab, follow the steps below. This lab is due at the end of the lab class 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 completed test plan by the date and time indicated by your instructor to the appropriate forum and topic in the D2L discussion board. The test plan should be submitted as an attachment to your discussion post. This attachment should be a Microsoft Word document or a PDF if using a tool other than Word. The contents of this document should be neatly organized.

☐ 3. 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:

Outside of the PL/SQL code, create a new sequence called **seq_contract_number** that starts at 10 and increments by 1. This sequence will be used to create new contract numbers.

In a PL/SQL procedure, add a new contract to the ATA database. Use the SEQ_CONTRACT_NUMBER sequence just created in the INSERT statement for the contract number. A value must be placed into each column in the INSERT – all other column values will come into the procedure through the parameter list and will be IN parameters. HINT: You will have four parameters for this procedure.

Test this procedure on the SQL*Plus command line.

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

Create a function that counts the number of characters in a string (sent in as a parameter). This function should contain no SELECT statements. Hint: Think of a single function we used last semester that returns the number of characters in a string.

Test this function through a SELECT statement on the SQL*Plus command line.

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

Create a function that, for a given contract number (sent in as a parameter value), will return the fee for that contract.

Test this function through a SELECT statement on the SQL*Plus command line.

Lab Tasks

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

Use your flowchart solution (or the solution provided by your instructor) from Module 2 Lab 2 for the following lab questions (below is a reiteration of the problem to refresh your memory):

> *The Astra Talent Agency (ATA) application needs to calculate the total fee for each performance. The total fee is calculated by multiplying the number of hours a performance takes by the hourly fee for that event type. Each event type will have its own hourly fee. Unfortunately, these hourly fees are not stored in the database but there is a chart (below) that maps out the hourly fee for each event type. The total number of hours a performance takes will not be stored in the system; it must be calculated. Input coming into the system would be the start time of the performance and the end time (remember that dates include the day as well as the time) and the event type. Based on this input information, you should be able to calculate / determine the number of hours and the hourly fee. In addition, a $100 additional fee is added to any performance that starts on a Monday or Friday.*

Type of Event	**Hourly Fee**
Children's Party	$335.00
Concert	$1,000.00
Divorce Party	$170.00
Wedding	$300.00
All other event types	$100.00

- Note: In the database "***Children's Party***" does not use the apostrophe, it is simply "***Childrens Party***"

☐ 1. USE the testing information (the values were roughed in in Lab 2) to create a test plan that will test each component and integration point (test-to-pass **and** test-to-fail).

Where to start:

- Figure out each component
  - A component in this case would be one procedure or one function
- For each component, identify what the input would be and what the output or resulting action should be and what tests should be performed
  - **See the table below for an example structure to break the components out**
- Based on your flowchart, determine how each component fits together and start determining the integration points that will need to be tested.

Component / Integration Point	Input	Output / Resulting Action	Procedure or Function?

☐ 2. CREATE PL/SQL stored procedures and functions to solve this problem.

Code restrictions / guidelines:

- The ultimate goal of our program is to calculate the total fee for each contract currently in the system
- The final calculated total fee will be stored in the ATA_CONTRACT table (FEE column)
- If a value needs to be returned from a stored program, use a function rather than a procedure (only use IN type parameters)
- Each procedure and function should do only one thing to maintain optimal reusability
- The main exception handler and transactional control commands should be in one central location which will be the calling routine
- Use an anonymous block for your calling routine

- Code each component
- Test each component
- Put together components (integration)
- Test each integration point

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.