Assignment 2; COMP2605; Date Due: 02-Nov-2018;

What to Submit? **Written answers with ID number on each page (staple please) to DCIT COMP 2605 Assignment Box.**

Question 1

The following relational schema represents a portion of a Regional telephone service provider database. The Database keeps track of the countries in which the company provides service (including the number of clients in that country) and the information about the customers themselves. Each account must be associated with an accountType (E.g. Business, Residential) and one telephone number. A customer can have multiple accounts with the company. When a customer signs up for their first account, they are given a number which is unique to them and each account has a unique number.

Country (CountryCode, CountryName, NumClients)

AccountType (AccountTypeId, TypeName, MonthlyRental)

Customer (CustId, CustName, Street, City, Email)

TelephoneListing (TelephoneNumber, CountryCode, CustId, RegistrationDate)

AccountListing (AccountNumber, TelephoneNumber, AccountTypeId, MailingAddress, AccountBalance)

(a) Draw an ERD (Entity Relationship Diagram) for the telephone service provider database based on the schema provided. Show the minimum and maximum cardinalities on each side of all relationships. State any reasonable assumptions that you have made **[15 marks]**

(b) Carefully explain the cardinalities between the AccountListing and TelephoneListing tables. You should clearly explain your choices for the maximum and minimum cardinalities on either side of the relationship. **[5 marks]**

[20 marks]

Question 2

Consider the following SQL query

```
Select TelephoneNumber
From ClientListing
Where custId='CUS125';
```

(a) Describe the Linear Search Data Access method for executing the above query. **[4 marks]**

(b) Which column would need to be indexed to use the Indexed search method for the above query? **[2 marks]**

(c) Comment on the expected efficiency of the Linear Search method compared to the Indexed search method for the above query. **[4 marks]**

[10 marks]

Question 3

Suppose the initial conceptual design for the telephone service provider database consisted of a single table as follows

AccountListing *(TelephoneNumber, AccountTypeId, MonthlyRental, CustId, CountryCode, CountryName, MailingAddress)*

(a) Identify the partial dependencies which exist. **[5 marks]**

(b) Normalize the relation to the 2NF. **[4 marks]**

(c) Identify the transitive dependencies which exist. **[2 marks]**

(d) Normalize the relation to the 3NF. **[4 marks]**

[15 marks]

[Total: 45 marks]