NIT6130 Introduction to Research

Assignment 4 – Experiment Design & Result Analysis

Semester 2, 2017

Due Date: *11:59pm, Friday, Week 12*
Submission Requirement: *submit online via a link in Assessment on VU Collaborate*
Value: *25% of semester assessment*

Objective:

The purpose of this assignment is to help students getting familiar with the process of design and implement experiments for their research projects. Students will review, analyse, design, implement experiments to evaluate the proposed methodology in previous assignment, and report experimental results and findings as well.

Tasks:

1. Collect your data for experiment
    a. Identify the available data sources for collection.
    b. Select the most appropriate data source(s) and start data collection. You are asked to record the data sources that you have found, brief description of the available data using the following sample table:

Data Source Name	Source Organization	Data Description	Data File Format	URL (if available online)	Charge Fee	Target data source
Data 1	Sport Centre, VU	Exercise training record	txt	http://xxxxxxx	Free	Yes
Data 2	…	…	…	…	$1000	No

    c. Store the collected data in appropriate file format. You need to save the collected raw data, and keep a copy at all times.
        i. Create a folder called “raw data” to store the collected raw data
        ii. Record your data collection using the following sample table:

Data Source Name	Date of Collection	Saved File Location	Saved File Name	Saved File Format	No. of Data Records
Data 1	15/3/2016	//raw data/	xxxx.txt	txt	2000
Data 3	…	…	…	…	

2. Design and implement experiments
    a. Adopt data pre-processing. Not all the collected raw data are available as direct input of your methodology.
    b. Feature selection or dimension reduction. You may need to select some of data features or data records from the entire data collection, not to use all the collected data. In other case, you may need to reduce the dimensionality of the collected data to simplify the data processing in the later stages. You need to save the result data set into a new file. You are asked to record these works using the following sample table.

Date	Data Source Name	Purpose of Pre-processing	Pre-processing Method	No. Original Data Records	No. Result Data Records	No. Original Features	No. Result Features	New Data File Name
20/3/2016	Data 1	Clean the missing data	Pre-fill the missing values	2000	2000	10	10	Data1_full.txt
22/3/2016	Data 1	Feature Selection	xxxxxx	2000	2000	10	6	Data1_6features.txt
…	Data 3	…	…	…	…			

    c. Design your experiment based on the proposed methodology. The main purpose of experiments is to prove that your methodology can provide expected outcomes. You can follow the experiments that you have read from literatures or any other ways that is suitable for your case. Your experiments procedure need to be detailed recorded, including instruction steps, input data, expected output, potential problems and other related issues. When state the procedure of experiment, you can use extra table, figure, chart, diagram to provide better description.

Date	Experiment	Purpose of Experiment	Description of Procedure	Input Data	Expected Output	Result File Name
26/3/2016	Experiment 1	Evaluate Method 1	…	…	…	Output1.txt

    d. To implement your experiment, normally you need to use software/tools or write your own program. Record your experiment results for each run as the references of the following analysis task.

3. Result analysis and summary

a. What are the expected results that you want to obtained from the experiment? You need to have a rough idea of what you may have in advance; you cannot wait until the experiment is done.
b. Plan your result analysis by thinking of what result you may have first. Write a summary of why you expected to have that results, how they can be linked to your research problems.

4. Write up your experiment and result analysis chapter.
    a. Provide an outline of your experiment and result analysis chapter, including up to four levels of subsections. Only need to list the chapter titles (level 1), section titles (level 2), subsection titles (level 3), and sub-subsection titles (level 4).

Marking criteria

Assessment Criteria:	Mark
Data Collection	
• **Data source list**	2
• **Data collection record**	3
Experiment Design and Implementation	
• **Data pre-processing**	2
• **Feature selection or dimension reduction**	3
• **Experiment design**	3
• **Experiment implementation records**	2
Experiment Result Analysis & Summary	
• **The expected results**	2
• **Summarize your expected results to answer research problems**	3
Outline of Experiment and Result Analysis Chapter	**5**
Total	**25**