AP/ADMS2320
Summer (SU) 2014
Assignment # 1

Assignment Instructions (please read carefully)

1. While we encourage study groups and brainstorming, assignments are to be done on an individual basis. They are **NOT** group work. Please review the Senate Policy on Academic Honesty at the following URL: http://www.yorku.ca/secretariat/policies/document.php?document=69

2. Penalties for infractions such as cheating and/or plagiarism are severe and will be enforced.

3. Assignments are to be **typed** on the computer using statistical analysis programs and word processing programs (i.e. Word and Excel).

4. Your name and student number must be on **every** page of your assignment.

5. One cover page for the assignment should be included, not a cover page for each section. **The cover page has been created for you and is found along with this assignment on the course website ("Assignment 1 Cover Page.doc").**

6. 10 or 11 font should be used (Times New Roman or Arial for the font type).

7. Pages are to be numbered in a "number of number" format (i.e. 3 of 10, 4 of 10).

8. Assignments should be organized by question. That means every piece of information for that question is found in the same section of the report. If I have to look for it, it is not organized.

9. Assignments are due at the beginning of lecture as per the course outline; late or handwritten assignments will **NOT** be accepted.

10. Equations can be generated in either word or excel using the following instructions within the program: Insert > Object > Microsoft Equation if you want to include them.

11. Please remember that this is a testing instrument and because of fairness to all students **we will not be answering questions related to the assignment**, just do your best.

12. You are to complete ***All*** Cases and Questions for full mark consideration.

Note: Hand written material, either text ,graph, or table will not be considered part of Assignment, hence will not be marked.

This Assignment file is having 5 pages including this cover page.

Case 1 : Descriptive Statistics & Career Success Factors (45 marks)

You've been reflecting, since entering university, on what career strategy you want to pursue - a more balanced work/leisure approach or a 'do what it takes', rise-to-the-top approach. After a long period of soul-searching you concluded that career success is your primary objective. Given that choice you're determined to identify the factors that improve the odds of accomplishing your goals. You've done your research and obtained a random sample from 100 senior executive 'head hunters' on the key career success factors.

The data is contained in the *Assignment1-SU-2320.xls file; tab "*Career Success Factors'

The data fields consist of the following (after 5 years with the organization):

1. Gender (F=0, M=1)
2. Average rating on annual performance reviews (out of 5; 5 being highest)
3. MBA degree (yes=1, no=0)
4. Total # of employees (# direct reports + the # of people that report to them)
5. # of 'level 1' Linkedin contacts within the industry sector
6. Total compensation (salary, bonuses, commissions).

You're also interested in understanding which majors have the greatest impact in helping someone reach the CEO role. From the same 'head-hunters' study you've isolated the 40 CEO's in the study and identified their business degree major. This data can be found in *Assignment1-SU-2320.xls file; tab* 'Career Success Majors'.

Required:

i) Use the appropriate graphical techniques, to describe salaries, # of employees, performance review scores and # of Linkedin contacts.

ii) Use the appropriate graphical techniques to identify and describe the possible relationship between:

(1) salary and # of employees;
(2) salary and # of Linkedin contacts; and
(3) salary and performance review scores.

iii) Choose the best two tabular and the best two graphical tools to describe the Career Success Major data and write a brief summary on the results you obtain.

Case 2: Atkinson Institute (15 marks)

Atkinson Institute provides statistics on the most popular major incoming college freshmen. The five most popular major are Arts and Humanities, Business Administration, Engineering, Finance, and Social Science while many Other Majors are available. Data stored in Excel file. *Assignment1-SU-2320.xls file; tab* 'Atkinson Institute'.

A. Create a frequency, relative frequency, cumulative relative frequency distribution table.
B. Use appropriate graphical techniques to represent data.
C. What percentage of freshmen selects one of five most popular majors?
D. What is the most popular major for incoming freshmen? What percentage of freshmen selects this major?

Case 3: MVP Mobile (A) and (B) (30 marks)

MVP Mobile (A)

You work for MVP Mobile as a marketing analyst. MVP Mobile sells the GLX I Smartphone with either the Silver Plan or the Gold Plan. Customers can later upgrade to the Platinum Plan. You have to analyze the results of a market study that asked 2,500 Toronto residents about whether they planned to buy the company's GLX I Smartphone over the next six months. The same 2,500 residents were surveyed three months later to find out if they had actually bought the company's Smartphone. The results are shown in the following table.

PLANNED TO BUY	ACTUALLY BOUGHT		
	Yes	No	Total
Yes	500	125	625
No	250	1,625	1,875
Total	750	1,750	2,500

Also, for the Toronto residents who actually bought the company's smartphone, the study asked them whether they bought the Silver Plan or the Gold Plan, and whether they later upgraded to the Platinum Plan. The results are shown in the following table.

TYPE OF PLAN BOUGHT	UPGRADED TO PLATINUM PLAN		
	Yes	No	Total
Silver	54	126	180
Gold	342	228	570
Total	396	354	750

For the Toronto residents who bought the company's smartphone with the Silver Plan or the Gold Plan, the study asked them whether they were satisfied with the type of plan they bought. The results are shown in the following table.

TYPE OF PLAN BOUGHT	SATISFIED WITH PLAN BOUGHT		
	Yes	No	Total
Silver	144	36	180
Gold	456	114	570
Total	600	150	750

Required:

Use the results of this market study to develop a marketing strategy that will increase sales and better target Toronto residents who are likely to buy the company's Smartphone and the type of plan they buy. Your strategy should address but not be restricted to the following questions and be supported by appropriate marginal, joint and conditional probabilities.

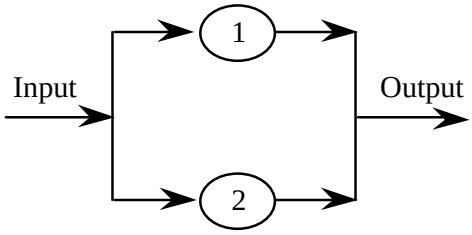
- Should your marketing strategy target those residents who indicated their intention to buy the Smartphone?
- Should you focus on selling Smartphone with the Gold Plan?
- How likely is it that if Toronto residents bought the Smartphone with the Gold Plan, they will upgrade to the Platinum Plan?

MVP Mobile (B)

MVP Mobile is also considering the introduction of a new Smartphone, GLX II. From past experience, the probability of the introduction of a new Smartphone being a success is 40% while the probability of the introduction of a new Smartphone being a failure is 60%.
Before introducing the new Smartphone, MVP Mobile will hire a research firm which will then issue a report that is either Favorable or Unfavorable. Historically, 90% of the new Smartphone that were introduced successfully received a favorable report, and 20% of the new Smartphone that were introduced unsuccessfully received a favorable report. For the new Smartphone, GLX II, the research firm has issued a favorable report. Should MVP Mobile introduce the new Smartphone?

Case 4: System Functioning (10 marks)

A system has two components that operate in parallel, as shown in the following diagram. Because the components operate in parallel, at least one of them must function properly if the system is to function properly. The probabilities of failures for the components 1 and 2 during one period of operation are 0.20 and 0.03, respectively. Let *F* denote the event that component 1 fails during one period of operation and *G* denote the event that component 2 fails during one period of operation. The component failures are independent.



Required:

1. What is the event corresponding to the above system failing during one period of operation?

2. What is the event corresponding to the above system functioning properly during one period of operation?

3. What is the probability that the system functions properly during one period of operation closest to:

4. The probability that the system fails during one period of operation is closest to: