MIS770 Foundation Skills in Data Analysis

DEPARTMENT OF INFORMATION SYSTEMS AND BUSINESS ANALYTICS
DEAKIN BUSINESS SCHOOL
FACULTY OF BUSINESS AND LAW, DEAKIN UNIVERSITY

Assignment Two

Analysis of Employee Survey Data

Particulars

- **Due:** Week 10, Thursday 20th January 2022, 8:00 pm (AEST).
- **Marks:** 30%.
- **Words:** 2,000 words or approximate equivalent.
  Note: Part of your submission involves visualisations (in Excel) which ultimately account for a proportion of this word count. Accordingly, your report (Word document) should be approximately 3 pages in length.
- **Submission:** Two files (Excel, Word) electronically via CloudDeakin.
  Email submissions **will not** be accepted.
  Note: Do not convert your Word document to pdf format.
- **Notes:** This assignment is to be completed individually.
  Please ensure you are familiar with the **Extension Request** and the **Late Penalties** rules governing assignments in the Faculty of Business and Law (see details below).

Assurance of Learning

This assignment assesses the following Graduate Learning Outcomes and related Unit Learning Outcomes:

Graduate Learning Outcome (GLO)	Unit Learning Outcome (ULO)
GLO4: Critical thinking: evaluating information using critical and analytical thinking and judgment	**ULO2:** Manipulate and summarise data that accurately represents real world problems **ULO3:** Interpret and appraise statistical output to assist in real-world decision making

Faculty of Business and Law Assignment Extension Procedures

Information for students seeking an extension BEFORE the due date

If you wish to seek an extension for this assignment prior to the due date, you need to apply directly to the unit chair by completing the **Assignment and Online Test Extension Application Form (pdf, 208.58Kb)** (available from https://www.deakin.edu.au/students/faculties/buslaw/student-support/assignment-extensions) and sending the completed form as well as your supporting documentation to our generic email address t32021mis770@deakin.edu.au. (**Note:** completing the extension application form is **mandatory** if you wish to apply for an extension.)

This process needs to occur as soon as you become aware that you will have difficulty in meeting the due date.

Please note: Unit chairs can only grant extensions up to **two weeks** beyond the original due date. If you require more than two weeks or have already been provided an extension by the unit chair and require additional time, you must apply for special consideration via StudentConnect within 3 business days of the due date.

Misreading the due date/time, assignment anxiety or returning home will not be accepted as grounds for consideration.

Conditions under which an extension will normally be considered include:

- **Medical** – to cover medical conditions of a serious nature, e.g., hospitalisation, serious injury or chronic illness. Note: temporary minor ailments such as headaches, colds and minor gastric upsets are not serious medical conditions and are unlikely to be accepted. However serious cases of these may be considered.
- **Compassionate** – e.g., death of a close family member, significant family and relationship problems.
- **Hardship/Trauma** – e.g., sudden loss or gain of employment, severe disruption to domestic arrangements, victim of crime.

Information for students seeking an extension AFTER the due date

If the due date has passed; you require more than two weeks extension, or you have already been provided with an extension and require additional time, you must apply for **Special Consideration** via StudentConnect. Please be aware that applications are governed by university procedures and must be submitted within three business days of the due date or previously granted extension due date.

In most instances the maximum amount of time that can be granted for an assignment extension is two weeks after the due date, as unit chairs are required to have all assignment submitted before results/feedback can be released back to students.

Penalties for late submission

The following marking penalties will apply if you submit an assessment task after Thursday 20th January 2022, 8:00 pm (AEST) without an approved extension:

- 5% will be deducted from the available marks for each day, or part thereof, up to five days.
- Work that is submitted more than five days after the due date will not be marked; you will receive 0% for the task.

Note: 'Day' means calendar day.

Calculation of the late penalty is as follows: this is based on the assignment being due on a Thursday at 8:00pm

- 1 day late: submitted after Thursday 11:59pm and before Friday 11:59pm– 5% penalty.
- 2 days late: submitted after Friday 11:59pm and before Saturday 11:59pm – 10% penalty.
- 3 days late: submitted after Saturday 11:59pm and before Sunday 11:59pm – 15% penalty.
- 4 days late: submitted after Sunday 11:59pm and before Monday 11:59pm – 20% penalty.
- 5 days late: submitted after Monday 11:59pm and before Tuesday 11:59pm – 25% penalty.

The unit chair may refuse to accept a late submission where it is unreasonable or impracticable to assess the task after the due date.

Support

The Division of Student Life (see link below) provides all students with editing assistance. Students who wish to take advantage of this service must be organized and plan ahead and contact the Division of Student Life in order to schedule a booking, well in advance of the due date of this assignment. (http://www.deakin.edu.au/about-deakin/administrative-divisions/student-life)

Additional information

For advice regarding academic misconduct, special consideration, extensions, and assessment feedback, please refer to the document "Rights and responsibilities as a student" in the "Unit Guide and Information" folder under the "Content" section in the T32021 MIS770 CloudDeakin site.

Marking and feedback

The marking rubric for this task is below, on the last page. It is always a useful exercise to familiarise yourself with the criteria before completing any assessment task. Criteria act as a boundary around the task and help identify what assessors are looking for specifically in your submission. Thecriteria are drawn from the unit's learning outcomes ensuring they align with appropriate graduate attribute/s.

Identifying the standard you aim to achieve is also a useful strategy for success and to that end, familiarising yourself with the descriptor for that standard is highly recommended.

Students who submit their work by the due date will receive their marks and feedback on CloudDeakin 15 working days after the submission date.

Overview

The purpose of this assignment is to investigate a dataset that has been produced as a result of the survey you conducted on employee turnover. You now need to interrogate the dataset in order to answer questions posed by your client, Globex Corporation. Ultimately, you will need to analyse the data, interpret the results, and thendraw appropriate conclusions.

The aims of the assignment are to:

- provide you with some examples of the application of data analysis
- test your understanding of the material presented in the relevant topics
- test your ability to analyse data and effectively communicate your results in a language best suited to target audience

Before attempting the assignment, make sure you have prepared yourself well. At a minimum, please read the relevant sections of the prescribed textbook and review the learning materials provided in modules 1 and 2 (i.e., Topics 1 to 7).

Scenario

Globex Corporation has previously commissioned you, **Leanne Levesque** (Chief Analyst at Survey House), to develop a survey to help them gauge the views of the company's employees regarding **"Employee Turnover"**. Now, in order to implement possible staff retention initiatives, the company, through their representative **Phil Rowe** (Manager, Human Resources Department), wants you to process and analyse the data gathered from your survey and then answer several questions.

Phil does not have an analytics background, so it's important that you utilise "**plain, easy to understand language**"in your answers. If you believe you need to include any technical terms, then you must explain these in a **clear** and **succinct** manner using layman's terms.

The questions you need to answer are contained in the following memorandum.

Memorandum

Date: 16th December, 2021
To: Leanne Levesque, Chief Analyst, Survey House
From: Phil Rowe, Manager, Human Resources Department, Globex Corporation
Subject: Analysis of Employee Turnover Survey Data

Dear Leanne,

Can you please carry out an analysis of the recent Employee Turnover Survey data (contained in the file **EmployeeTurnoverSurvey.xlsx**) and prepare a report containing answers to the following questions.

Q1. Summaries of key variables of interest

Can you please provide me with separate summaries of the following variables, just by themselves? In other words, please investigate each variable individually without reference to any other variable in the dataset.

(a) "AverageYearly%SalaryIncrease" – the average yearly % salary increase each employee has experienced in their time with the company.

(b) "JobSatisfaction" – how happy employees are with their current roles within the company.

Q2. Exploring relationships between two variables

(a) I suspect there is some link between the hourly pay rate ("HourlyRate") and the duration of time employees spend working at the company, both the hours they work each week ("HoursPerWeek") and the number of years they have worked for the company ("YearsAtCompany"), but I'd still like you to establish from your sample data if there is any relationship between these three variables.

(b) I'm also interested to establish if there is a relationship between attrition ("Attrition") and whether an employee is often required to work overtime ("Overtime").

(c) Further, it would be helpful if we knew if the age ("Age") of a person had any relationship to their experience of work-life balance("WorkLifeBalance").

Q3. Estimating Work-Life balance measures

(a) Another factor possibly affecting work-life balance and employee attrition is the time required to travel to work. Therefore, can you estimate the average ("TravelTime") employees are experiencing working for the company?

(b) As you may realise, time spent working can constitute a large amount of an individual's lifetime and therefore the quality of relationships people have in the workplace can greatly affect a person's wellbeing. Due to this, I'm interested to know if you can estimate the combined proportion of all employees who state that they experience Medium or Low relationship satisfaction ("RelationshipSatisfaction")at our company.

Q4. Confirming existing claims

(a) A previous report provided to Globex indicated that in order to manage staffing expenses the average hourly pay rate ("HourlyRate") offered should not be in excess of $70 per hour. Are you able to confirm that this recommendation is being followed based on your survey data?

(b) Another finding in that report concerned the work environment of Globex employees ("EnvironmentSatisfaction"). The report indicated that at least 70% of employees had a High or Very High rating for their work environment. Can you also check this claim against your survey data?

Q5. Appropriate sample size

Finally, I am somewhat concerned about time and cost associated with collecting the sample date from the 1470 employees for this survey. For future surveys we intend, we would like to be able to:

(a) calculate approximately the average hours worked per week ("HoursPerWeek") that is representative of the company to within 0.5hrs, and

(b) estimate the proportion of employees that have decided to leave the company each year ("Attrition") accurately to within 2.5%.

Therefore, what is the minimum number of employees we would need to include in next year's survey to provide accurate results and satisfy **both** of these requirements?

Regards, Phil

Report Requirements

- Your report should be no longer than 3 pages and there is no need to include any visualisations (i.e., Charts and Tables),or Appendices in the Report.
- Your report must, however, have a cover sheet containing your personal particulars and the Unit details, table of contents, an executive summary, introduction and conclusion.
- The Charts/Graphics and Tables you create are only to be placed in the Data Analysis file (i.e. the Excel spreadsheet) and not reproduced in the report.
- Your report is meant to be a stand-alone document. That is, it should be able to be read without looking at the data analysis. To this end, do not refer to the visualisations as "as you can see from Figure 1 etc". You need to interpret your data analysis visualisations for Phil in the report.
- Suggested Word formatting for the report: Single-line spacing; no smaller that 10- point font; page margins approx. 25mm, and good use of white space.
- Set out the report in the same order as in the originating Memorandum from Phil, with each section (question) clearly marked.
- Use plain language and keep your explanations concise. Avoid the use of technical or statistical jargon. As a guide to the meaning of "Plain Language", imagine you are explaining your findings to a person without any statistical training (e.g., someone who has not studied this unit). What type of language would you use in that case?
- Marks will be lost if you use unexplained technical terms, irrelevant material, or have poor presentation/organisation.
- All Microsoft Excel output associated with each question in the Memorandum is to be placed in the corresponding tab in the file **EmployeeTurnover _*yourstudentid*.xlsx**

Data Analysis Instructions/Guidelines

In order to prepare a reply to Phil's memorandum, you will need to examine and analyse the dataset **EmployeeTurnoverSurvey.xlsx** thoroughly.

Phil has asked a number of questions and your data analysis output (i.e., your charts/tables/graphs) should be structured such that you answer each question on the separate tab/worksheet provided in your Excel document. There are also extra tabs in **EmployeeTurnoverSurvey.xlsx** called CI, HT and SS and you should use the various templates contained in these tabs in your "Confidence Interval", "Hypothesis" and "Sample Size" answers.

In order to effectively answer the questions, your data analysis output needs to be appropriate. Accordingly, you'll need to establish which of the following techniques are applicable for any given question:

- Summary Measures (e.g., descriptive statistics, Inc. outlier detection, percentiles).

- Comparative Summary Measures (i.e., descriptive statistics, outlier detection and percentiles for multiple values of a variable).
- Suitable tables (such as a frequency distribution) and charts or graphics (such as histograms, box plots, pie charts, bar/column charts, polygons) that will illustrate more clearly, other important features of a variable.
- Scatter Diagrams (used to visually establish if there is a relationship between two numeric variables).
- Cross Tabulations (sometimes called contingency tables), used to establish the relationships (dependencies) between two variables (see Additional Materials under Topic 2 – Creating Cross Tabulations in Excel using Pivot Tables).
- Confidence Intervals. You can assume that a 95% confidence level is appropriate. We use confidence intervals when we have no idea about the population parameter we are investigating. Additionally, we would use confidence intervals if we were asked for an **estimate**. You should use the relevant Excel templates provided in the dataset and copy them to the applicable question tab.
- Hypothesis Tests. You can assume that a 5% level of significance is appropriate. We use hypothesis tests when we are testing a **claim**, a **theory** or a **standard**. You should use the relevant Excel templates provided in the dataset and copy them to the applicable question tab.
- Sample size calculation: You can assume that a 95% confidence level is appropriate. You may include comparisons for 90% and 99% and a recommendation for the appropriate sample size.
- To answer some questions, you may need to make certain assumptions about the data set we are using. Mention these in your data analysis, where relevant. There is no need to mention this in the report.

Note: There is an appendix at the end of each chapter of the prescribed textbook which describes the basic Excel steps associated with that topic. Chapters 1 to 9 are applicable for this assessment.

Submission

Your completed assignment should be submitted in two separate files:

- Report (Part A): A word document of no more than 3 pages (excluding title and table of contents pages) that must **not** to contain any charts/tables/graphs. (Note: Do not submit a pdf document in lieu.). Please name your word document **EmployeeTurnover _*yourstudentid*.docx**
- Data Analysis (Part B): An Excel document containing separate tabs/worksheets with charts/tables/graphs for each question. Please note that all interpretations should be presented in your "Report" and the Excel document should only contain your intermediate analysis and final output. Please name your Excel document **EmployeeTurnover _*yourstudentid*.xlsx**

The assignment is to be submitted to the MIS770 assignment box in Deakin's Cloud Campus before **8 pm, Thursday 20th January 2022**. Please ensure you include your name and student details in your Word document as well following the above file naming convention. Failure to follow this convention may lead to a delay in receiving feedback and marks.

Marking Rubric

	Poor	Needs Improvement	Satisfactory	Good	Very Good	Excellent
Executive summary (Marks: 10)	0 points Does not communicate any of the main findings of the analysis in an accurate or useful way, or the findings are basic. 0 – 2.9 Marks	3 points Explains some main findings of the analysis accurately and enables reader to draw a few conclusions. 3 – 4.9 Marks	5 points Explains most of the main findings of the analysis accurately and enables reader to draw some reasonable conclusions. 5 – 5.9 Marks	6 points Explains nearly all main findings of the analysis accurately and enables reader to draw mostly reasonable conclusions. 6 – 6.9 Marks	7 points Provides detailed and accurate descriptions of the most important features of the analysis along with appropriately qualified conclusions. 7 – 7.9 Marks	10 points Provides outstanding descriptions and reaches conclusions that are carefully considered and insightful. 8 – 10 Marks
Data Analysis (Marks: 40) This part relates to the various visualisations in the form of charts, tables & graphs etc. created by Leanne which formed the basis of her response to Phil.	0 points Uses irrelevant or inappropriate techniques to analyse the data, or the Data Analysis and visualisation tools were used to analyse the data but in an incomplete or inaccurate manner. A very poor presentation of the analysis, or the analysis does not follow principles of good graphical display. 0 – 15.9 Marks	16 points Uses some appropriate data analysis and visualisation tools to analyse the data but there are many errors in the analysis. The presentation of the analysis needs improvement. 16 – 19.9 Marks	20 points Uses appropriate data analysis and visualisation tools to analyse the data but there are several errors in the analysis. The presentation of the analysis is satisfactory. 20 – 23.9Marks	24 points Uses appropriate data analysis and visualisation tools to analyse the data but there are some errors in the analysis. The presentation of the analysis is of a respectable standard. 24 – 27.9Marks	28 points Comprehensive analysis of the data using appropriate techniques, but there are some minor errors in the analysis. Uses data visualisations to understand patterns in data. The analysis is well organised and follows principles of good graphical display. 28 – 31.9 Marks	40 points Skilful and comprehensive analysis of data using many different techniques. Uses data visualisations to produce novel insights. An excellent presentation of the analysis. 32 – 40 Marks
Report (Marks: 40) This part is the written response by Leanne to the questions posed by Phil.	0 points Does not communicate any of the main findings of the analysis in an accurate and/or useful way, or the interpretation and communication of findings is at a basic level. The written communication is unprofessional or difficult to follow and contains numerous errors. 0 – 15.9 Marks	16 points Explains some of the main findings of the analysis accurately which only enables the reader to draw a few reasonable conclusions. The written communication is not very easy to follow and/or it contains too many errors. 16 – 19.9 Marks	20 points Explains most of the main findings of the analysis accurately and enables the reader to draw several reasonable conclusions. The written communication is clear and easy to follow but it contains minor errors. 20– 23.9 Marks	24 points Explains nearly all of the main findings of the analysis accurately and enables the reader to draw mostly reasonable conclusions. The written communication is clear and easy to follow and generally free of errors. 24 – 27.9Marks	28 points Provides detailed and accurate descriptions of the most important features of the analysis along with appropriately qualified conclusions. The written communication is professional, easy to follow and has a good structure. 28 – 31.9Marks	40 points Provides outstanding descriptions and conclusions that are carefully considered and insightful. The written communication is very professional, logical and easy to follow. 32 – 40Marks
Overall Assignment Presentation (Marks: 10)	0 points No attempt has been made to follow the assignment Requirements/ Instructions/ Guidelines. Poorly presented 0 – 2.9 Marks	3 points Little attempt has been made to follow the assignment Requirements/ Instructions/ Guidelines. Unsatisfactorily presented 3 – 4.9 Marks	5 point Majority of the assignment Requirements/ Instructions/ Guidelines have been followed. Satisfactorily presented 5 – 5.9 Marks	6 point Nearly all of the assignment Requirements/ Instructions/ Guidelines have been followed. Good presentation 6 – 6.9 Marks	7 points All of the assignment Requirements/ Instructions/ Guidelines have been followed. Very good presentation 7 – 7.9 Marks	10 points All of the assignment Requirements/ Instructions/ Guidelines have been dealt with meticulously. Faultless assignment presentation 8 – 10 Marks