

Assessment (non-exam) Brief

Module code/name	MSIN0017 Business Analytics
Module leader name	Yufei Huang
Academic year	2023/24
Term	1
Assessment title	Coursework 2
Individual/group assessment	Individual

Submission deadlines: Students should submit all work by the published deadline date and time. Students experiencing sudden or unexpected events beyond your control which impact your ability to complete assessed work by the set deadlines may request mitigation via the [extenuating circumstances procedure](#). Students with disabilities or ongoing, long-term conditions should explore a [Summary of Reasonable Adjustments](#).

Return and status of marked assessments: Students should expect to receive feedback within one calendar month of the submission deadline, as per UCL guidelines. The module team will update you if there are delays through unforeseen circumstances (e.g. ill health). All results when first published are provisional until confirmed by the Examination Board.

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Academic Misconduct: Academic Misconduct is defined as any action or attempted action that may result in a student obtaining an unfair academic advantage. **Academic misconduct includes plagiarism, obtaining help from/sharing work with others be they individuals and/or organisations or any other form of cheating.** Refer to [Academic Manual Chapter 6, Section 9: Student Academic Misconduct Procedure - 9.2 Definitions](#).

Referencing: You must reference and provide full citation for ALL sources used, including AI sources, articles, text books, lecture slides and module materials. This includes any direct quotes and paraphrased text. If in doubt, reference it. If you need further guidance on referencing please see [UCL's referencing tutorial for students](#). Failure to cite references correctly may result in your work being referred to the Academic Misconduct Panel.

Use of Artificial Intelligence (AI) Tools in your Assessment: Your module leader will explain to you if and how AI tools can be used to support your assessment. In some assessments, the use of generative AI is **not permitted** at all. In others, AI may be used in an **assistive** role which means students are permitted to use AI tools to support the development of specific skills required for the assessment as specified by the module leader. In others, the use of AI tools may be an **integral** component of the assessment; in these cases the assessment will provide an opportunity to demonstrate effective and responsible use of AI. See page 3 of this brief to check which category use of AI falls into for this assessment. Students should refer to the [UCL guidance on acknowledging use of AI and referencing AI](#). Failure to correctly reference use of AI in assessments may result in students being reported via the Academic Misconduct procedure. Refer to the section of the UCL Assessment success guide on [Engaging with AI in your education and assessment](#).

Content of this assessment brief

Section	Content
A	Core information
B	Coursework brief and requirements
C	Module learning outcomes covered in this assessment
D	Groupwork instructions (if applicable)
E	How your work is assessed
F	Additional information

Section A: Core information

Submission date	08/12/2023
Submission time	2pm
Assessment is marked out of:	100
% weighting of this assessment within total module mark	10%
Maximum word count/page length/duration	10 pages
Footnotes, appendices, tables, figures, diagrams, charts included in/excluded from word count/page length?	including everything
Bibliographies, reference lists included in/excluded from word count/page length?	including everything
Penalty for exceeding word count/page length	Penalty for exceeding word count will be a deduction of 10 percentage points, capped at 40% for Levels 4,5, 6, and 50% for Level 7) Refer to Academic Manual Section 3: Module Assessment - 3.13 Word Counts.
Penalty for late submission	Standard UCL penalties apply. Students should refer to https://www.ucl.ac.uk/academic-manual/chapters/chapter-4-assessment-framework-taught-programmes/section-3-module-assessment#3.12
Artificial Intelligence (AI) category	Not permitted
Submitting your assessment	Submission is via Moodle. Please only submit one single pdf file including everything. Do not include name or student number, as the marking is anonymous.
Anonymity of identity. Normally, <u>all</u> submissions are anonymous unless the nature of the submission is such that anonymity is not appropriate, illustratively as in presentations or where minutes of group meetings are required as part of a group work submission	The nature of this assessment is such that anonymity is required.

Section B: Assessment Brief and Requirements

Business Analytics: Coursework 2

1. The planning fallacy is the tendency that people estimate the time required for the completion of a project as shorter than it really is. To test whether people in your company exhibit planning fallacy, a sample of 36 workers was selected. The workers were asked how long it would take them to perform a certain task. The mean of their answers was 40 minutes. Then, they were asked to perform the task. The time they needed to complete it had mean 43 minutes. Suppose the standard deviation of completion time (i.e. the population standard deviation) is known to be 5 minutes:

- a. Is there sufficient evidence that the population mean time to complete the task is greater than 40 minutes? Use a level of significance of 0.05. Do these results support the claim, that people in your company exhibit a planning fallacy?
- b. Is there sufficient evidence that the population mean time to complete the task is different from 40 minutes? Use a level of significance of 0.01
- c. Repeat Section a, but assume that the standard deviation of the time required to complete the task is known to be 9 minutes instead of 5 minutes. In addition, perform the test using a significance level of 0.01. What is the p-value?

Please submit complete solutions for all sections. You can use a calculator and the normal distribution table.

2. The following data give the yearly inflation rate and money supply growth rate for sixteen Latin American countries (both Inflation and Growth are in units of percentage points):

Inflation	43	41.3	35.1	28.2	26.4	12.5	9.2	8.5	5.3	3.4	3	2.1	1.9	1.1	1.1	0.3
Growth	40.1	41.6	38.2	25.2	24.6	15.4	16.5	13.4	11.3	8.6	8.8	8.0	9.0	5.9	7.9	3.5

A simple regression of Inflation on Growth yields:

R	R Square	Adj. R Sqr	St. Err of Est	df	F	p-value
0.987	0.974	0.972	2.568	14	525.679	0.000

Variable	Coeff.	Std. Err	t-value	p-value
Constant	-6.854	1.110	-6.176	0.000
Growth	1.194	0.052	22.928	0.000

- What is the R^2 value? What does it mean?
- Give details of the linear relationship implied by these data. Is there a significant relationship and why? And what is the magnitude?
- What would the expected inflation be for a country with an 8% money supply growth?
- Find the 95% prediction interval for the expected inflation rate for a country with an 8% growth in the money supply.

3. Stock market analysts have suggested that January is a good indicator of the behaviour of the stock market during the entire year. The data shown in the attached figure consists of the changes in stocks in the Standard and Poor's (S&P) 500 index during January and the corresponding changes in the same index for the entire year. Data are provided for the years 1950 to 2010. Conduct an analysis of the reported data and answer the following questions.

- a. What percentage of the variation in the yearly performance of the S&P 500 can be explained by the performance of this index in January? (In other words, find the R^2). Explain the relevance of this percentage.
- b. Do you believe that January can serve as a predictor of the stock market's performance for the entire year? (In other words, is there a relationship?) Explain.
- c. In January of 2011, the S&P 500 index increased by 2.3%. Predict the performance of the index for the entire year. Also give a 95% prediction interval.
- d. Based on the 95% prediction interval, comment on the usefulness of the January indicator.

S&P 500 index returns (excluding dividends) Source: Yahoo.com

Date file is also available on Moodle.

Year	January Change (%)	Annual Change (%)	Year	January Change (%)	Annual Change (%)
1950	2.3	22.5	1981	-4.6	-9.7
1951	4.3	14.4	1982	-1.8	14.8
1952	1.4	11.6	1983	3.3	17.3
1953	-0.6	-6.5	1984	-0.9	1.4
1954	4.5	44.2	1985	7.4	26.4
1955	-0.3	23.8	1986	0.2	14.6
1956	-3.0	3.3	1987	13.2	2.0
1957	-3.2	-13.4	1988	4.0	12.4
1958	3.4	36.9	1989	7.1	27.3
1959	0.0	8.0	1990	-6.9	-6.6
1960	-7.2	-3.0	1991	4.2	26.3
1961	7.3	24.3	1992	-2.0	4.5
1962	-3.8	-11.8	1993	0.7	7.1
1963	4.9	18.9	1994	3.2	-1.6
1964	2.7	13.0	1995	2.4	34.1
1965	3.3	9.1	1996	3.3	20.3
1966	0.5	-13.1	1997	6.1	31.0
1967	7.8	20.1	1998	1.0	26.7
1968	-4.4	7.7	1999	4.1	19.5
1969	-0.8	-11.4	2000	-5.1	-10.0
1970	-7.6	0.1	2001	3.5	-13.0
1971	4.0	10.8	2002	-1.6	-23.4
1972	1.8	15.6	2003	-2.7	26.4
1973	-1.7	-17.4	2004	1.7	9.0
1974	-1.0	-29.7	2005	-2.5	3.0
1975	12.1	31.4	2006	2.5	13.6
1976	11.8	19.1	2007	1.4	3.5
1977	-5.1	-11.5	2008	-4.7	-37.6
1978	-6.2	1.1	2009	-8.8	23.5
1979	4.0	12.3	2010	-4.0	12.6
1980	5.8	25.8	2011	2.3	

Section C: Module Learning Outcomes covered in this Assessment

This assessment contributes towards the achievement of the following stated module Learning Outcomes as highlighted below:

This assignment contributes towards the achievement of the following stated module Learning Outcomes as below:

- Understand key concepts in statistics.
- Interpret data from descriptive statistics, measures of central tendency and measures of dispersion.
- Critically analyse datasets and sampling methods.
- Apply statistical tests to verify significance of findings.
- Identify appropriate methods to present data.
- Recognise the benefits and limitations of statistical calculations and analysis.

Section D: Groupwork Instructions (where relevant/appropriate)

N/A

Section E: How your work is assessed

Within each section of this assessment you may be assessed on the following aspects, as applicable and appropriate to this assessment, and should thus consider these aspects when fulfilling the requirements of each section:

- The accuracy of any calculations required.
- The strengths and quality of your overall analysis and evaluation;
- Appropriate use of relevant theoretical models, concepts and frameworks;
- The rationale and evidence that you provide in support of your arguments;
- The credibility and viability of the evidenced conclusions/recommendations/plans of action you put forward;
- Structure and coherence of your considerations and reports;
- Appropriate and relevant use of, as and where relevant and appropriate, real world examples, academic materials and referenced sources. Any references should use either the Harvard OR Vancouver referencing system (see [References, Citations and Avoiding Plagiarism](#))
- Academic judgement regarding the blend of scope, thrust and communication of ideas, contentions, evidence, knowledge, arguments, conclusions.
- Each assessment requirement(s) has allocated marks/weightings.

Student submissions are reviewed/scrutinised by an internal assessor and are available to an External Examiner for further review/scrutiny before consideration by the relevant Examination Board.

It is not uncommon for some students to feel that their submissions deserve higher marks (irrespective of whether they actually deserve higher marks). To help you assess the relative strengths and weaknesses of your submission please refer to [SOM Assessment Criteria Guidelines](#), located on the Assessment tab of the SOM Student Information Centre Moodle site.

The above is an important link as it specifies the criteria for attaining the pass/fail bandings shown below:

At UG Levels 4, 5 and 6:

80% to 100%: Outstanding Pass - 1st; 70% to 79%: Excellent Pass - 1st; 60%-69%: Very Good Pass - 2.1; 50% to 59%: Good Pass - 2.2; 40% to 49%: Satisfactory Pass - 3rd; 20% to 39%: Insufficient to Pass - Fail; 0% to 19%: Poor and Insufficient to Pass - Fail.

At PG Level 7:

86% to 100%: Outstanding Pass - Distinction; 70% to 85%: Excellent Pass - Distinction; 60%-69%: Good Pass - Merit; 50% to 59%: Satisfactory - Pass; 40% to 49%: Insufficient to Pass - Fail; 0% to 39%: Poor and Insufficient to Pass - Fail.

You are strongly advised to review these criteria before you start your work and during your work, and before you submit.

You are strongly advised to **not** compare your mark with marks of other submissions from your student colleagues. Each submission has its own range of characteristics which differ from others in terms of breadth, scope, depth, insights, and subtleties and nuances. On the surface one submission may appear to be similar to another but invariably, digging beneath the surface reveals a range of differing characteristics.

Students who wish to request a review of a decision made by the Board of Examiners should refer to the [UCL Academic Appeals Procedure](#), taking note of the [acceptable grounds](#) for such appeals.

Note that the purpose of this procedure is not to dispute academic judgement – it is to ensure correct application of UCL's regulations and procedures. The appeals process is evidence-based and circumstances must be supported by independent evidence.

Section F: Additional information from module leader (as appropriate)

Marking scheme is as follows:

Q1 [total 30 marks]

Q1a: 10 marks

Q1b: 10 marks

Q1c: 10 marks

Q2 [total 30 marks]

Q2a: 5 marks

Q2b: 15 marks

Q2c: 5 marks

Q2d: 5 marks

Q3 [total 40 marks]

Regression analysis output from Excel: 10 marks

Q3a: 5 marks

Q3b: 5 marks

Q3c: 5 marks

Q3d: 15 marks

Further notes: A complete answer should include key steps, i.e., definitions, equations and final results. Answers should also include brief explanations and justifications of the approaches/equations/theories used in the calculation. If the questions request, a brief summary or discussion of results should also be included in the answer. Partial marks may be given to correct key steps if final result is wrong.

