



OLLSCOIL NA GAILLIMHE  
UNIVERSITY OF GALWAY

# Final Assessment 2024/25

## End-of-Module Assignment

Module Code: MS5128

Module Name: Decision Theory AI and Analysis

### Assignment Title: Final Assessment

Objective	<p>The objective of this assignment is to assess your understanding of the following learning outcome(s):</p> <ul style="list-style-type: none"><li>• Understand the major elements of decision theory and how to exploit them in decision making.</li><li>• Critically evaluate different decision-making methods, models, tools, and techniques</li><li>• Understand the basic components of unsupervised and supervised learning in AI &amp; analytics.</li><li>• Critique future trends, challenges, and opportunities on the role of AI and analytics in decision-making</li></ul>
Lecturer	Dr. Anastasia Griva
Marks Awarded	<p>This assignment carries <b>45%</b> of the overall marks for the module.</p> <p>Guidelines for grading this assignment are included at the end of this document.</p>
Submission	<p>You should submit your completed assignment through Blackboard's Assignment tool.</p> <p>If you are <u>unable</u> to submit your assignment via Blackboard, please email it to your lecturer by email at <a href="mailto:anastasia.griva@universityofgalway.ie">anastasia.griva@universityofgalway.ie</a></p> <p>You don't need to specifically name your assignment submission document if submitting it via Blackboard, but if you need to email in your assignment, please name your document (as an email attachment) as follows:</p> <p><b>Student ID number ... Module Code ... Discipline ... Assignment title.pdf</b> : e.g. <b>12345678 12345678 MS5104 Decision Theory and Analysis.pdf</b></p>

<p><b>Submission Deadline</b></p>	<p><b>21/12/2024 at 4pm Irish time (+ 30 mins grace to 4:30pm for any upload issues)</b></p> <p>There will be an extra 30 mins (to 4:30pm) to accommodate any potential uploading issues. You will have multiple attempts to submit, and we will correct the last submitted version.</p> <p>To avoid technical issues we strongly advise you to upload your submission <u>well in advance of the deadline</u>. You may submit at any time on any day prior to the deadline.</p>
<p><b>Academic Integrity</b></p>	<p>Each module instructor reserves the right to follow up with a student by interview if there is any concern in relation to the integrity of the assignment.</p> <p>For any assignments not submitted via Turnitin, we reserve the right to check it using Turnitin where required.</p> <p>All students must have received an email from the Registrar about integrity. Additionally to this, you are required to include the following disclaimer statement as part of your submission:</p> <p><i><b>"In submitting this work I confirm that it is entirely my own. I acknowledge that I may be invited to undertake an online interview if there is any concern in relation to the integrity of my submission."</b></i></p>
<p><b>Non-submission</b></p>	<p>Non-submission, or submission after the deadline (4pm + 30 mins grace) will carry a mark of zero in determination of overall marks for this sitting.</p>
<p><b>Deferral</b></p>	<p>You may request a deferral of this assignment until Autumn, if you are unable to perform the work or submit it for the semester deadline. To request a deferral, email <a href="mailto:business@universityofgalway.ie">business@universityofgalway.ie</a>, stating your ID, module code, and the assignment(s) you wish to defer. CC your lecturer on this email. Put 'deferral' in the email subject line.</p>
<p><b>Deliverables</b></p>	<p>An electronic file (or multiple files) constructed using Microsoft Office or equivalent. Ideally your submission should be typed in 12-point font, 1.5 spaced, with pages numbered. Your document should ideally be in one of the following formats: pdf, Word, or Excel (where relevant). Students can install Microsoft Office 365 on up to 5 devices, see <a href="https://www.nuigalway.ie/o365/overview/">https://www.nuigalway.ie/o365/overview/</a></p> <p><b>Your submission should not exceed 3000 words, excluding table of contents, bibliography, graphs, tables, and the disclaimer, but including any appendices</b></p>
<p><b>Special Requirements</b></p>	<p>If you are registered with the Disability Support Service (DSS), you will find recommended accommodations listed on your <b>Learning and Educational Needs Summary (LENS) report</b>. If the assessment offered for this module does not fully meet the recommendations in your LENS report, please email your lecturer as well as <a href="mailto:business@universityofgalway.ie">business@universityofgalway.ie</a>, stating clearly how you feel the</p>

	recommendations are not being met. Please ensure you attach a copy of your LENS report to this email.																														
Referencing	If you are using any references, please use the Harvard referencing style, instructions for which can be found on the NUI Galway Library Website, section Styles & Styles Guide: Citing & Referencing: <a href="http://libguides.library.nuigalway.ie/c.php?g=672922&amp;p=4791378">http://libguides.library.nuigalway.ie/c.php?g=672922&amp;p=4791378</a>																														
Plagiarism	<b>University of Galway Plagiarism Code of Practice</b> All work submitted by students for assessment, for publication or for (public) presentation, is accepted on the understanding that it is their own work and contains their own original contribution, except where explicitly referenced using the accepted norms and formats of the appropriate academic discipline.  Plagiarism is the act of copying, including or directly quoting from the work of another without adequate acknowledgement, in order to obtain benefit, credit or gain. You are required to familiarise yourself with the NUI Galway Plagiarism Code and ensure that the work you submit does not contain plagiarised elements. <a href="https://www.universityofgalway.ie/plagiarism/">https://www.universityofgalway.ie/plagiarism/</a>																														
Assignment Details	<p>“Vidflix”, a well-known streaming service in Europe. The company uses analytics to segment its users according to the film genres they watch. The table below presents a processed sample of their datasets. Each row represents a user, their preferences in terms of films or series they have watched, and the last column presents the names they have provided when they were “painting” the user personas.</p> <table><tr><th>Users</th><th>Preferences</th><th>Clusters/Personas</th></tr><tr><td>User 1</td><td>Batman begins, The Flash, Arrow, The Legends of tomorrow, The umbrella academy, Squid game</td><td>Geeks</td></tr><tr><td>User 2</td><td>The Sandman, Squid game, Stranger Things</td><td>Trendies</td></tr><tr><td>User 3</td><td>Designated survivor, House of Cards, Mr robot, Squid game</td><td>Political &amp; conspiracy seekers</td></tr><tr><td>User 4</td><td>The crown, Sense8, Squid game, The Sandman, Stranger Things, BoJack Horseman, The IT Crowd, Peppa Pig</td><td>Family accounts</td></tr><tr><td>User 5</td><td>Sherlock, Stranger Things</td><td>Mystery lovers</td></tr><tr><td>User 6</td><td>The crown, Good Girls, Modern family, Master of None, Squid Game</td><td>Housewives</td></tr><tr><td>User 7</td><td>Big bang theory, How I met your mother, Community, The Sandman</td><td>Sitcom lovers</td></tr><tr><td>User 8</td><td>Squid game, The Sandman, Stranger Things</td><td>Trendies</td></tr><tr><td>User 9</td><td>Big bang theory, How I met your mother, Squid game, Friends, BoJack Horseman</td><td>Sitcom lovers</td></tr></table>	Users	Preferences	Clusters/Personas	User 1	Batman begins, The Flash, Arrow, The Legends of tomorrow, The umbrella academy, Squid game	Geeks	User 2	The Sandman, Squid game, Stranger Things	Trendies	User 3	Designated survivor, House of Cards, Mr robot, Squid game	Political & conspiracy seekers	User 4	The crown, Sense8, Squid game, The Sandman, Stranger Things, BoJack Horseman, The IT Crowd, Peppa Pig	Family accounts	User 5	Sherlock, Stranger Things	Mystery lovers	User 6	The crown, Good Girls, Modern family, Master of None, Squid Game	Housewives	User 7	Big bang theory, How I met your mother, Community, The Sandman	Sitcom lovers	User 8	Squid game, The Sandman, Stranger Things	Trendies	User 9	Big bang theory, How I met your mother, Squid game, Friends, BoJack Horseman	Sitcom lovers
Users	Preferences	Clusters/Personas																													
User 1	Batman begins, The Flash, Arrow, The Legends of tomorrow, The umbrella academy, Squid game	Geeks																													
User 2	The Sandman, Squid game, Stranger Things	Trendies																													
User 3	Designated survivor, House of Cards, Mr robot, Squid game	Political & conspiracy seekers																													
User 4	The crown, Sense8, Squid game, The Sandman, Stranger Things, BoJack Horseman, The IT Crowd, Peppa Pig	Family accounts																													
User 5	Sherlock, Stranger Things	Mystery lovers																													
User 6	The crown, Good Girls, Modern family, Master of None, Squid Game	Housewives																													
User 7	Big bang theory, How I met your mother, Community, The Sandman	Sitcom lovers																													
User 8	Squid game, The Sandman, Stranger Things	Trendies																													
User 9	Big bang theory, How I met your mother, Squid game, Friends, BoJack Horseman	Sitcom lovers																													

User 10	The Flash, Arrow, The Legends of tomorrow, The umbrella academy, Stranger Things	Geeks
---------	---	-------

Vidflix is the market leader in Europe, however, in the US they have a small market share, since another company leads the US market. The managers of Vidflix are searching for external solutions to improve their services by providing targeted and accurate film recommendations to their users. Their goal is to provide this new service to both the EU and the US market.

They are currently discussing with a start-up named “FilMine”, which has already developed a recommendation system for a major Vidflix’s competitor in Europe. FilMine’s head of BA states that *“we already know which are the right variables to select and build a new and accurate AI-enabled film recommendation system”*. Also, he mentions that *“even after Vidflix selects to purchase our solution, we will not reveal how our algorithm works as this is a company secret”*.

**Based on the aforementioned data you are asked to answer the following questions.**

**Question 1:**

The CEO of the company asked your opinion on FilMine’s BA head statements. Your opinion and recommendations will influence her final decision. Provide clear examples to assist her decide. Comment on both statements.

**(Marks 55)**

**Question 2:**

How can Vidflix further leverage the datasets they currently have to provide value to their customers and support decision-making? In your answer, consider the following:

- Assume that Vidflix owns additional data sources (e.g., user demographics) and can use them to enrich their existing results.
- You may make reasonable assumptions about these additional datasets.
- Provide specific examples to support your answer. You may reference real-world cases or relevant articles to strengthen your argument.

**Instructions:**

1. Use a Generative AI (GAI) tool (e.g., ChatGPT) to generate an initial response to the question.
2. Include a screenshot of the prompt and the GAI-generated response in your submission.
3. Critique one (or two depending on the space) of the suggestions provided by the GAI, highlighting its feasibility, limitations, or gaps. Expand on this suggestion with your own insights.

4. If you disagree with the GAI-generated response entirely, explain why, and provide your own detailed answer.

(Marks 35)

**Question 3:**

Vidflix's CEO is interested in exploring the following association rule:

The Sandman → Squid Game & Stranger Things

What does it mean? Does it indicate an opportunity? Assume that you have to explain this to business people. What do you recommend them?

(Marks 10)

To help with expectations of standard of submission, following is a general set of Grade Descriptors as proposed by the NUI Senate.



Ollscoil na hÉireann  
NATIONAL UNIVERSITY OF IRELAND

GRADE DESCRIPTORS, AS PROPOSED BY THE NUI SENATE

Explanatory Note:

The Grade Descriptors below are offered as indicative descriptors. It is accepted that these indicative descriptors are particularly appropriate for examinations based on essay-type questions but may be found less suitable for examinations in subjects where there are detailed marking schemes.

Grade	Marks %	Descriptor
1 <sup>st</sup> CLASS HONS	90-100	<p><u>Supreme</u> performance, engaging profoundly, systematically and comprehensively with question set, brilliantly demonstrating</p> <ul style="list-style-type: none"> <li>a superlative mastery of the subject matter, richly supported by evidence and citation, reflecting deep and broad knowledge and understanding as well as extensive reading</li> <li>an outstanding ability to organise, analyse and express ideas and arguments in an original, sophisticated and discriminating manner</li> <li>an optimal capacity for critical analysis</li> <li>the display of rare penetrative insight, originality and creativity</li> </ul>
	80-89	<p><u>Exceptional</u> performance, engaging deeply and systematically with the question set, with consistently impressive demonstration of</p> <ul style="list-style-type: none"> <li>a comprehensive mastery of the subject matter; amply supported by evidence and citation,</li> <li>reflecting deep and broad knowledge and critical insight as well as extensive reading</li> <li>an exceptional ability to organise, analyse and present arguments fluently and lucidly with a high level of critical analysis</li> <li>a highly-developed capacity for original, creative and logical thinking;</li> </ul>
	70 -79	<p><u>Excellent</u> performance, engaging closely and systematically with the question set, with consistently strong evidence of</p> <ul style="list-style-type: none"> <li>a comprehensive mastery of the subject matter, ably supported by evidence and relevant citation</li> <li>excellent ability to organise, analyse and express arguments fluently and lucidly with a high level of critical analysis</li> <li>a highly-developed capacity for original, creative and logical thinking</li> </ul>
2 <sup>nd</sup> CLASS HONS (Grade 1)	60-69	<p><u>Very Good</u> performance, engaging substantially with the question set, demonstrating strong grasp of the subject matter, well supported by evidence and relevant citation</p> <ul style="list-style-type: none"> <li>well-developed capacity to analyse issues, organise material, present arguments clearly and cogently</li> <li>some original insights and capacity for creative and logical thinking</li> </ul>

J.E. Cairnes School of Business & Economics

2 <sup>nd</sup> CLASS HONS (Grade 2)	50-59	<p><u>Good</u> performance - intellectually competent answer (i.e. factually sound) with evidence of a reasonable familiarity with the relevant literature and techniques</p> <ul style="list-style-type: none"> <li>• acceptable grasp of the subject material</li> <li>• ideas stated rather than developed and insufficiently supported by evidence and relevant citation</li> <li>• writing of sufficient quality to convey meaning but some lack of fluency and command of suitable vocabulary</li> <li>• omission of parts of the subject in question or the appearance of several minor errors</li> <li>• average critical awareness and analytical qualities</li> <li>• limited evidence of capacity for original and logical thinking</li> </ul>
3 <sup>rd</sup> CLASS HONS	<p>45-49</p> <p>40-44</p>	<p><u>Satisfactory</u> performance – intellectually adequate answer with evidence of some familiarity with the relevant literature and techniques</p> <ul style="list-style-type: none"> <li>• basic grasp of subject matter, but somewhat lacking in focus and structure</li> <li>• main points covered in answer, but lacking detail</li> <li>• some effort to engage, but only a basic understanding of the topic portrayed</li> <li>• some development of argument</li> <li>• only some critical awareness displayed</li> <li>• no evidence or relevant citation included in answer</li> <li>• appearance of several minor errors or one major error</li> <li>• lacking evidence of capacity for original and logical thinking</li> </ul> <p><u>Acceptable</u> performance – intellectually adequate answer with limited familiarity with the relevant literature and techniques</p> <ul style="list-style-type: none"> <li>• basic grasp of subject matter but limited focus on question asked</li> <li>• unclear presentation of argument, random layout, with some omissions or inaccuracies in answer</li> <li>• argument insufficiently developed</li> <li>• no evidence or relevant citation supplied</li> <li>• appearance of one major error and minor errors</li> <li>• inclusion of unsubstantiated statements and/or irrelevant material</li> <li>• descriptive rather than argumentative or analytical answer presented</li> <li>• an attempt to solve moderately difficult problems related to the subject material and an attempt to examine the material in a critical and analytical manner only partially successful</li> <li>• an incomplete or rushed answer e.g. the use of bullet points through part / all of answer</li> </ul>
FAIL*	35-39	<p><u>Unacceptable</u> performance, with either</p> <ul style="list-style-type: none"> <li>- insufficient understanding of the question displayed</li> <li>- failure to address the question resulting in a largely irrelevant answer</li> <li>- a display of some knowledge of material relative to the question posed, but with very serious omissions / errors and/or major inaccuracies included in answer</li> <li>- or answer left somewhat incomplete for lack of time</li> </ul> <p><u>Also:</u></p> <ul style="list-style-type: none"> <li>• limited understanding of question displayed</li> <li>• a random layout / underdeveloped structure - not planned sufficiently</li> <li>• poor analytical skills, with an absence of argument</li> <li>• random and undisciplined development - limited structure</li> <li>• lack of clarity, poor spelling</li> <li>• material of marginal relevance predominating</li> </ul>
FAIL	<35	<u>Wholly unacceptable</u> performance, with

		<ul style="list-style-type: none"> <li>- deficient understanding of the question displayed</li> <li>- complete failure to address the question resulting in an irrelevant answer</li> <li>- inadequate knowledge displayed relative to the question posed</li> <li>- or answer left incomplete for lack of time</li> </ul> <p>Also:</p> <ul style="list-style-type: none"> <li>• very poor analytical skills, with an absence of argument</li> <li>• random and undisciplined development –poorly structured answer</li> <li>• confused expression, poor spelling</li> <li>• irrelevant material predominating</li> </ul>
Fail* - within 'Pass by Compensation' range		