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CO3008 Honours Degree Project

Ethics

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Where opportunity creates success

This Session

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- Time Planning (from last week)
- Discuss the Assignment Brief
- Discuss Ethics in computing projects
- Run some thought experiments around ethics
- Review some examples of ethical issues in tech

Picking up from Last Week

Time Planning

- It isn’t possible to produce a successful project based solely on a period of intense activity immediately before the final deadline

- Need to work consistently and effectively throughout the duration of the project
  - The is value in keeping momentum

- Can be helpful to record project related activity in a log
  - E.g. a weekly record of work you have engaged in to meet your objectives
  - Can include records of supervision meetings and actions arising

Time Planning

- Be disciplined and protective of your project time
  - You will thank ‘student you’ later in life
- Find a system that works for you and helps keep you on track
- For help and advice
  - Your supervisor is a resource
  - Your personal tutor is a resource
- This project will be challenging
  - Mainly because of the self discipline, time and effort required
  - Satisfaction and experiential learning are some of the rewards

The Pomodoro Technique

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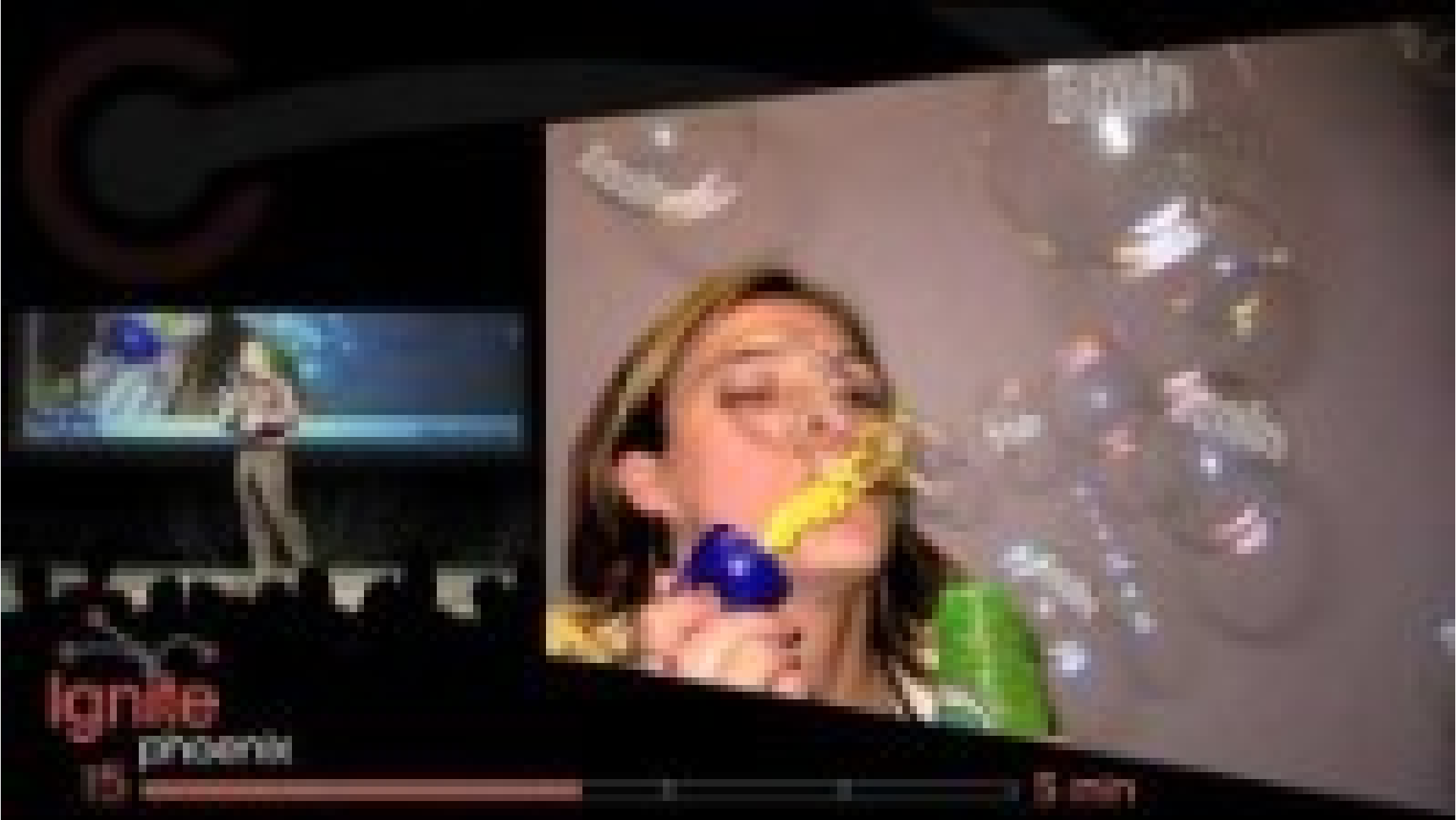
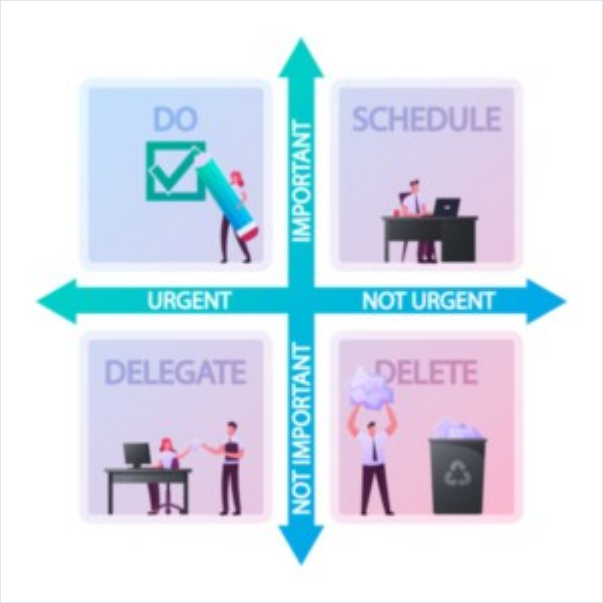
- Time Management Method
- Created by a student to help with studies
- Uses timer to break down work into intervals
- Traditionally 25 mins in length
  - Separated by short breaks
- Widely popularised with many online timers and apps
  - https://pomofocus.io/
- Closely related to timeboxing
  - And incremental development


Ignite
proverbs

Time Planning Techniques

- Kanban Charts + Estimation
  - E.g. Trello
- Goal Setting
- ABCD Technique
  - Don’t ignore the most important or valuable tasks
  - Prioritise (MoSCoW at a finer level)
  - Consider the Pareto Principle (80/20 rule)
- Eisenhower Matrix
- GTD Technique (Getting Things Done)



Read More: https://arc.dev/developer-blog/time-management-skills/

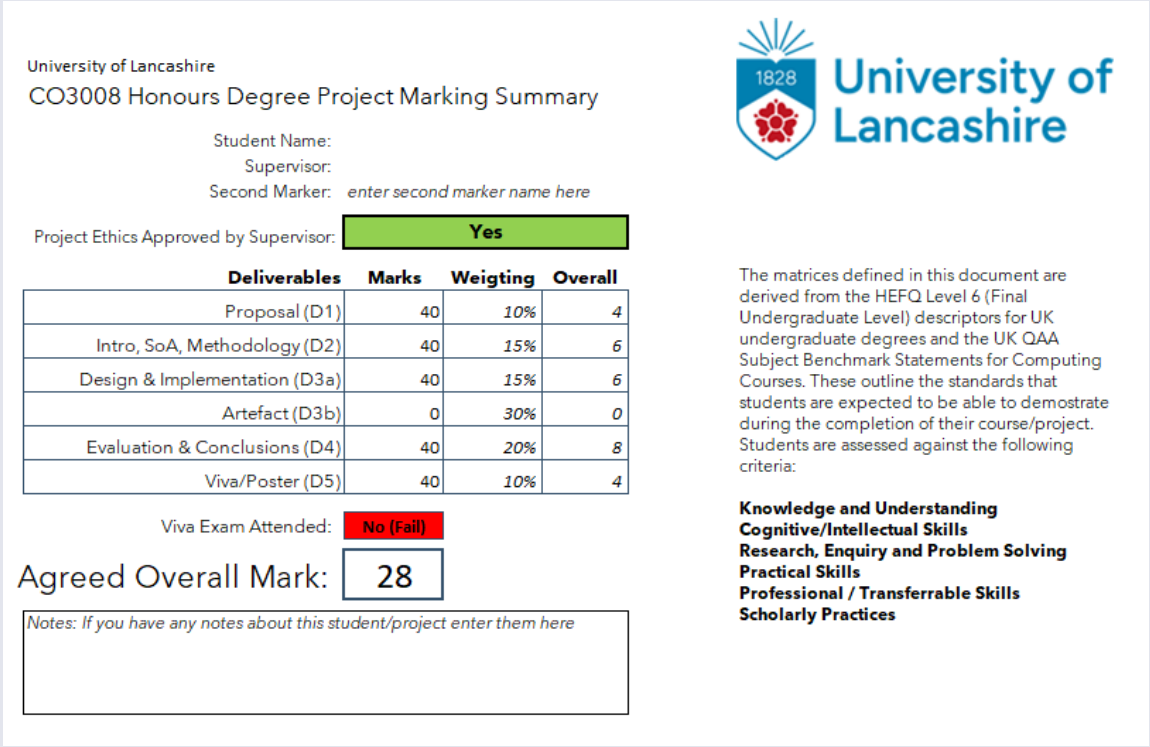
Resources Planning

- Time may only be one resource for your project
- You may need special equipment at certain times
  - E.g. from university stores
- Your supervisor is a resource
- University labs are resources
- The university library is a resource
- Are you going to need to acquire any other resources to be successful in your project?
  - How do you plan to do it?

Marking Matrix

Marking Matrix Released

- Multi Tab Spreadsheet
- Summary Spreadsheet calculates your running total towards your final project mark
- All Projects Double Marked
- Artefact Component (D3b) may not be finalised until you have presented your viva



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CO3008 Honours Degree Project Marking Summary

Student Name:
Supervisor:
Second Marker: *enter second marker name here*

Project Ethics Approved by Supervisor: **Yes**

Deliverables	Marks	Weigting	Overall
Proposal (D1)	40	*10%*	*4*
Intro, SoA, Methodology (D2)	40	*15%*	*6*
Design & Implementation (D3a)	40	*15%*	*6*
Artefact (D3b)	0	*30%*	*0*
Evaluation & Conclusions (D4)	40	*20%*	*8*
Viva/Poster (D5)	40	*10%*	*4*

Viva Exam Attended: **No (Fail)**

Agreed Overall Mark: 28

Notes: If you have any notes about this student/project enter them here

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The matrices defined in this document are derived from the HEFQ Level 6 (Final Undergraduate Level) descriptors for UK undergraduate degrees and the UK QAA Subject Benchmark Statements for Computing Courses. These outline the standards that students are expected to be able to demostrate during the completion of their course/project. Students are assessed against the following criteria:

Knowledge and Understanding
Cognitive/Intellectual Skills
Research, Enquiry and Problem Solving
Practical Skills
Professional / Transferrable Skills
Scholarly Practices

Marking Criteria

- Written Deliverables assess the following criteria
  - Knowledge and Understanding
  - Cognitive / Intellectual Skills
  - Research Enquiry and Problem Solving
  - Professional / Transferrable Skills
  - Scholarly Practices
- Artefact focused deliverables (D3 and D5) also assess
  - Practical Skills
- We assess each deliverable slightly differently
  - E.g. We are less concerned with ‘Scholarly Practices’ when marking your artefact

Written Deliverables: 6 Rows x 7 Columns

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Overall Mark: **Introduction, State of the Art, Methodology**

Highlight the cell that nost closely matches the submitted component (rows 6-10)

Marks	0---10	25---35	42---48	52---58	62---68	74---80	87---100
	Fail	Fail	Pass: 3rd	Pass: 2.2	Pass: 2.1	Ist	Ist
Knowledge and Understanding *e.g. systematic, extensive and comparative understanding of key aspects of the field of study, including coherent and detailed knowledge of the subject and critical understanding of relevant theories and concepts*	Major gaps in knowledge and understanding of material at this level. Substantial inaccuracies.	Gaps in knowledge, with only superficial understanding. Some significant inaccuracies.	Understanding of key aspects of the field of study; coherent knowledge, at least in part informed by current research in the subject discipline.	Systematic and sound understanding of field(s) of study, some evidence of critical judgement in thhe use of that knowledge	Good understanding of the field(s) of study; coherent knowledge, at least in part informed by current research in the subject discipline. Able to exercise critical judgement in the use of that knowledge	Excellent knowledge and understanding of the main concepts and key theories/concepts of the discipline(s). Clear awareness of the limitations of the knowledge base. Able to exercise insightful and critical judgement in the use of that knowledge.	Highly detailed knowledge and understanding of the main theories/concepts of the discipline(s), and an awareness of the ambiguities and limitations of knowledge. Able to exercise insightful and critical judgement. Demonstrated exceptional ability able to go beyond what has been previously taught.
Cognitive/Intellectual skills *e.g. analysis and synthesis; deploying logical arguments/solutions supported by evidence; focus on topic; drawing conclusions*	Unsubstantiated generalizations, made without use of any credible evidence. Lack of logic, leading to unsupportable/ missing conclusions. Lack of any attempt to analyse, synthesise or evaluate. Poor communication of ideas.	Some evidence of analytical intellectual skills, but for the most part descriptive. Ideas/findings sometimes illogical and contradictory. Generalized statements made with scant evidence. Conclusions lack relevance.	Understanding of key aspects of field of study; coherent knowledge, at least in part informed by current research in the subject discipline. Where appropriate showing effective judgement and adaptability in the selection and use of tools and techniques. Where appropraite, some judgement demonstrated in the selection and application of tools and techniques	Evidence of some logical, analytical thinking and synthesis. Can analyse new and/or abstract data and situations without guidance. An emerging ability to use evidence to support the argument. Valid conclusions. Where appropriate showing reasonable judgement and adaptability in the selection and use of tools and techniques	Sound, logical, analytical thinking; synthesis and evaluation. Ability to devise and sustain persuasive arguments, and to critically analyse the subject concepts and practices. Ability to communicate ideas and evidence accurately and convincingly. Sound, convincing conclusions. Where appropraite good judgement and adaptability demonstrated in the selection and use of tools and techniques	Thoroughly logical work. High quality analysis, developed independently.. Ability to investigate contradictory information and identify reasons for contradictions. Strong conclusions. Critically analyse and apply subject concepts, principles and practices. Where appropriate very good judgement and adaptability demonstrated in the selection and use of tools and techniques	Exceptional work; Very high quality analysis, developed independently. Ability to investigate contradictory information and identify reasons for contradictions. Highly persuasive conclusions. Critically analyse and apply a wide range of subject concepts, principles and practices. where appropraite excellent judgement demonstrated in the application of subject tools and techniques
Research, Enquiry and Problem Solving *e.g. grasping, framing and/or creating appropriate questions; methods for gathering evidence; ethics and integrity; analysis of evidence; computational problem solving; communicating findings in a style appropriate for a given context and audience*	Little or no evidence of research, enquiry or problem solving skills.	Limited evidence of research, enquiry and problem solving skills. Significant weaknesses evident, which suggest that the candidate has not yet gained the research and problem solving skills required for postgraduate study.	**Research/problem solving skills:** Can competently undertake reasonably straightforward research, enquiry and/or problem solving tasks with minimum guidance, but with minor weaknesses. Can **communicate** in a range of formats, at a standard appropriate for graduate---level employment, and with limited weaknesses.	**Research/problem solving skills:** Can competently undertake reasonably straightforward research, enquiry and/or problem solving tasks including evaluation with minimum guidance. Demonstrates some judgement when solving the problem. Can **communicate** effectively in a range of formats, at a standard appropriate for graduate---level employment. Adopts style and register appropriate for audience.	**Research skills:** Can successfully complete a range of research, enquiry and/or problem solving tasks, including effective evaluation, with very limited external guidance. emonstrates some judgement and criticality when solving the problem. Can **communicate** well, confidently and consistently in a range of formats, at a standard appropriate for graduate---level employment. Adopts style and register to engage audience(s).	**Research skills:** Can very successfully complete a range of research and/or problem solving tasks, including evaluation, with a significant degree of autonomy. emonstrates detailed judgement and criticality when solving the problem. Can **communicate** professionally and confidently in a range of formats for diverse audiences, at a high standard appropriate for graduate---level employment.	Impressive ability to draw on own research, and that of others, to formulate meaningful research questions and/or solutions. emonstrates sophisticated judgement and criticality when solving the problem. Exceptionally successful in a wide range of research and/or problem solving tasks, including evaluation, with a high degree of autonomy. Can communicate findings with real professionalism, adapting style easily for given audiences.

Written Deliverables: 6 Rows x 7 Columns

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Professional / Transferrable Skills *e.g. creativity; digital practices; presentation skills; ethical awareness and practice; self---management; project and time management; reflective practice; ability to identify an draw on learning points from work/professional contexts; ability to recognize own strengths and weaknesses, and to take steps to improve, by identifying and choosing appropriate methods.*	No evidence of graduate / professional skills necessary for graduate level employment.	Limited evidence of the graduate skills. Significant weaknesses evident, which suggest that the student has not gained the skills necessary for graduate level employment.	Is largely confident and effective in identifying and defining complex problems. Able to recognise own strengths and weaknesses in relation tto professional and practical skills, with minor areas of weakness. Identify practices and perform work within a professional, legal and ethical framework.	Is confident and flexible in identifying and defining complex problems. Able to evaluate own strengths and weaknesses in relation to professional and practical skills. Identify appropriate practices and perform work within a professional, legal and ethical framework E.g. security, equality, diversity and inclusion	Is confident and flexible in identifying and defining a range of complex problems. Able to take initiative in evaluating own strengths and weaknesses in relation to professional and practical skills, and act autonomously to develop new areas of skills as necessary. Identify appropriate practices and effect principled solutions within a professional, legal and ethical framework to address core considerations -E.g. security, equality, diversity and inclusion	Is professional and flexible in autonomously defining a range of complex problems. Shows insight and autonomy in evaluating own strengths and weaknesses and developing professional and practical skills needed for graduate-level employment. Identify best-of-kind practices and effect highly principled solutions within a professional, legal and ethical framework to consistently address a wide breadth of relevant considerations E.g. security, equality, diversity and inclusion	Is exceptionally professional and flexible in autonomously defining and solving a range of complex problems. Outstanding ability to evaluate own strengths and weaknesses, showing outstanding attributes for graduate---level employment.Identify best-of-kind practices and effect highly principled solutions within a professional, legal and ethical framework to consistently address a wide breadth of relevant considerations E.g. security, equality, diversity and inclusion
Scholarly Practices *e.g. use of relevant literature; academic writing; academic honesty, referencing and citation*	Little evidence of reading. Views and findings unsupported and non--- authoritative. Academic conventions largely ignored.	Evidence of little reading and/or of reliance on inappropriate sources, and/or indiscriminate use of sources. Academic conventions used inconsistently.	References to a range of relevant sources. Some omissions and minor errors. Academic conventions evident and largely consistent, with minor lapses.	Knowledge, analysis and evaluation of a range of research--- informed literature, including sources retrieved, analysed independently. Academic skills consistently applied.	Knowledge, analysis and evaluation of a range of research--- informed literature, including sources retrieved, analysed independently with accuracy and assurance. Good academic skills, consistently applied.	Excellent knowledge of research informed literature embedded in the work. Consistent analysis and evaluation of sources. High---level academic skills consistently applied.	Outstanding knowledge of research---informed literature embedded in the work. Consistent analysis and evaluation of sources. High---level academic skills consistently and professionally applied.
Marks	0---10	25---35	42---48	52---58	62---68	74---80	87---100

Overall Summary of your Submission

(enter a 3 or 4 sentence summary of your overall impression of the students work here)

Areas for improvement for next submission

(enter up to three points of feedback for how a student can improve their work for the next deliverable submission here)

D5 Viva

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Poster and Demo: | **Viva Exam Attended:** No (Fail)

Highlight the cell that nost closely matches the submitted component (rows 6-11)

Marks	0---10	25---35	42---48	52---58	62---68	74---80	87---100
	Fail	Fail	Pass: 3rd	Pass: 2.2	Pass: 2.1	Ist	Ist
Knowledge and Understanding *e.g. systematic, extensive and comparative understanding of key aspects of the field of study, including coherent and detailed knowledge of the subject and critical understanding of relevant theories and concepts*	Major gaps in knowledge and understanding of material at this level. Substantial inaccuracies.	Gaps in knowledge, with only superficial understanding. Some significant inaccuracies.	Understanding of key aspects of the field of study; coherent knowledge, at least in part informed by current research in the subject discipline.	Systematic and sound understanding of field(s) of study, some evidence of critical judgement in the use of that knowledge	Good understanding of the field(s) of study; coherent knowledge, at least in part informed by current research in the subject discipline. Able to exercise critical judgement in the use of that knowledge	Excellent knowledge and understanding of the main concepts and key theories/concepts of the discipline(s). Clear awareness of the limitations of the knowledge base. Able to exercise insightful and critical judgement in the use of that knowledge.	Highly detailed knowledge and understanding of the main theories/concepts of the discipline(s), and an awareness of the ambiguities and limitations of knowledge. Able to exercise insightful and critical judgement. Demonstrated exceptional ability able to go beyond what has been previously taught.
Practical skills *e.g. application of appropriate tools and techniques to provide a solution to a well defined problem.*	Does not demonstrate any or insufficient evidence of discipline-specific skills development or application. Has attempted practical tasks/processes but followed a very limited, procedural or mechanistic formula, and they contain errors, with no independence.	Limited evidence of discipline-specific skills development or application. Has attempted practical tasks/processes but followed a limited, procedural or mechanistic formula, and they contain errors, with little or no independence.	Demonstrates evidence of developing and applying discipline-specific specialist skills. Has completed practical tasks and/or processes accurately and with a degree of independence. Demonstrates ability to design, develop, integrate or deploy a computational artefact relevant to the subject with a degree of independence	Consistently demonstrated the development and informed application of discipline-specific specialist skills. Has consistently completed practical tasks/processes mainly independently in an accurate, well-coordinated and proficient way. Demonstrates ability to design, develop, integrate or deploy an appropriate computational artefact relevant to the subject area	Demonstrates capable and effective performance / demonstration of discipline-specific specialist skills. Has performed practical tasks and/or processes autonomously, with accuracy and coordination. Demonstrates ability to design, develop, integrate or deploy an effective computational artefact relevant to the subject area	Demonstrates an accomplished and innovative application of discipline-specific specialist skills. Has Autonomously completed practical tasks and/or processes with a high degreeof accuracy, coordination and proficiency. Demonstrates strong ability to design, develop, integrate or deploy an effective, highly complex computational artefact relevant to the subject area	Demonstrates an accomplished and innovative application of discipline-specific specialist skills. Autonomously completes practical tasks and/or processes with a high degreeof accuracy, coordination and proficiency. Exhibits a full range of exceptional technical, creative and/or artistic skills. Demonstrates exceptional ability to design, develop, test, integrate or deploy a highly effective complex computational artefact.
Research, Enquiry and Problem Solving *e.g. grasping, framing and/or creating appropriate questions; methods for gathering evidence; ethics and integrity; analysis of evidence; computational problem solving; communicating findings in a style appropriate for a given context and audience*	Little or no evidence of the required skills in any of the graduate skills identified in the programme specification at this level.	Significant weaknesses evident, which suggest that the candidate has not yet gained the skills required for postgraduate study.	Can **communicate** in a range of formats, **including orally**, at a standard appropriate for graduate---level employment, and with limited weaknesses.	Can **communicate** effectively in a range of formats, **including orally**, at a standard appropriate for graduate---level employment. Adopts style and register appropriate for audience.	Can **communicate** well, confidently and consistently in a range of formats, **including orally**, at a standard appropriate for graduate---level employment. Adopts style and register to engage audience(s).	Can **communicate** professionally and confidently in a range of formats, **including orally**, for diverse audiences, at a high standard appropriate for graduate---level employment.	Can communicate findings with real professionalism**, including orally**, adapting style easily for given audiences.
Marks	0---10	25---35	42---48	52---58	62---68	74---80	87---100

Feedback

- For EACH deliverable you will receive
  - A completed marking matrix with the appropriate criteria you have achieved shaded on the matrix
  - A 3 or 4 sentence summary of your supervisors overall impression of the work
  - Up to 3 points of feedback for how you can improve your work for the next submission

- 5 completed matrices in total with associated feedback on each deliverable of the work

- You can seek further clarification from your supervisor during the normal course of your supervision sessions if required

Ethics

Ethics Questionnaire

- As part of your proposal submission you will also be asked to complete an ethics questionnaire
- This is designed to get you thinking about the ethical implications of your project
- There are no marks attached to this but you will need to complete it before being given ethical sign off on your project by your supervisor
- The link for form completion will be provided on Blackboard

Is Ethics Relevant to my Project?

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- **ALL** projects will require an ethical analysis!
- As a computing professional we have a number of obligations that may fall under the remit of ethical conduct if not considered carefully
  - Do no harm
  - Acquire and maintain knowledge and skills
  - Maintain and deliver true and accurate data
  - Respect personal privacy
  - Put our users' needs first – deliver systems that work for them
  - Use the Earth's resources economically
  - Build and deploy systems which use electrical power efficiently.

https://www.bcs.org/articles-opinion-and-research/ethics-doing-the-right-thing-in-it/

Introduction to Ethics in University Computing Projects

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- What are Ethics?
  - Ethics refers to moral principles that guide behaviour and decision-making.
  - In computing, ethics ensures that technologies are developed responsibly and used for the benefit of society.

- Why Ethics Matter in Computing Projects
  - Protects user privacy and security.
  - Prevents unintended harm or bias.
  - Encourages accountability in technological innovation.

Key Ethical Principles in Computing

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- **Privacy:** Respecting users' personal information and their right to control how it is collected, stored, and shared.
- **Security:** Ensuring systems and data are protected from unauthorized access, breaches, and exploitation.
- **Fairness:** Developing systems that do not discriminate or introduce bias, ensuring equitable treatment of all users.
- **Transparency:** Making it clear how algorithms and technologies operate, especially regarding data use.
- **Responsibility:** Acknowledging the broader societal impacts of computing projects and taking ownership of potential consequences.

Common Ethical Challenges in University Computing Projects

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- **Data Privacy Violations:** Collecting or using personal data without proper consent.
- **Algorithmic Bias:** Machine learning models trained on biased data can reinforce existing inequalities (e.g., in hiring or criminal justice systems).
- **Security Vulnerabilities:** Inadequately secured systems can lead to data breaches, affecting thousands of users.
- **Misinformation and Manipulation:** Algorithms that spread or amplify false or harmful content on platforms like social media.

Case Study - AI and Ethics

- **Scenario:** A student develops an AI tool for profiling job applicants.
- **Benefits:**
  - Automates the hiring process.
  - Can potentially reduce bias if designed correctly.
- **Ethical Concerns:**
  - The AI may learn biases present in the training data, leading to unfair treatment.
  - Lack of transparency—how does the algorithm make decisions?
  - Privacy—what data is being used, and how is it being stored or shared?
  - Discussion: How should students design AI systems that are fair and transparent?
- **Discussion**: How should students design AI systems that are fair and transparent?

Disclosure

- The last 4 slides were all generated by ChatGPT with the following 1 sentence prompt

- “Please give me 4 slides for students on the ethics of university computing projects”
  - Is this ethical?

ACM Code of Ethics

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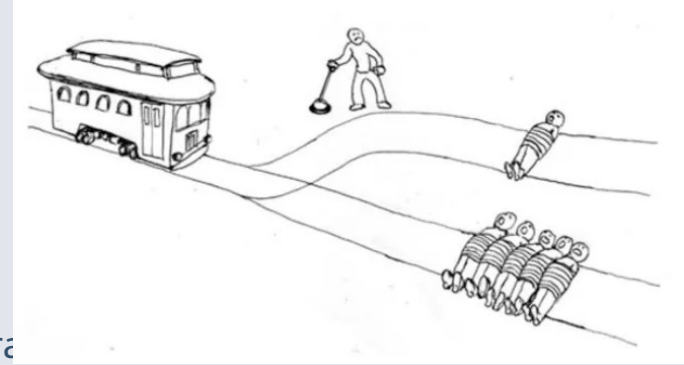
- General Ethical Principles. A Computing Professional Should…
  - Contribute to society and to human well-being, acknowledging that all people are stakeholders in computing.
  - Avoid Harm
  - Be Honest and Trustworthy
  - Be fair and take action not to discriminate
  - Respect the work required to produce new ideas, creative works, computing artefacts
  - Respect Privacy & confidentiality

Thought Experiment

Thought Experiment

- You work on the software for autonomous vehicles
- The system is able to predict with 99.9% probability that a life ending crash is going to occur
  - There is a family of 4 in the car
  - Driver carelessness caused the crash
- The crash can be avoided by taking evasive action, but sensors indicate a pedestrian will be hit (and likely killed) when the car swerves
- What should the system do?
  - Would the answer be different in different circumstances?
    - E.g. if car was on autopilot and not being recklessly controlled by a human

Trolley Problem



- A famous Ethical Dilemma
- A trolley is rolling down the tracks with 5 people tied to the tra
  - They cannot escape
  - They are going to be killed
- There is a lever that you can pull to redirect the trolley
  - One person will be killed
- What do you do?
  - Do nothing and 5 people will die
  - Pull the lever to save the 5 people and 1 person dies

Questions

- Is it ethical for a machine to knowingly allow an event that ends human life when it could intervene?

- What happens if the risk of the pedestrians death is reduced by 70%?
  - 30% chance an innocent pedestrian will die but a family will be saved even though the driver was at fault
  - Who gets to make these decisions?

- Would it be ethical for an autonomous car company to use camera data from customers cars to train its model without consent if it leads to greater safety and saved lives?

Another Example

- Greg Rutkowski is a famous fantasy artist
  - Dungeons and Dragons, Magic the Gathering, Neverwinter
  - Was one of the most prompted artists in early image based generative AI
- Is it ethical to train a generative AI to produce art in his style using his own art as training data without his consent?
  - The images are publicly available
- Is it ethical to use this generative AI to produce fantasy images for your project?
- Wh ed s to the

Questions

No it isn't ethical to use ChatGPT to write your project report!

- Is it ethical to use ChatGPT to generate copywriting articles for your website
  - It means a writer you normally hire freelance would no longer get the work but you would save money

- If someone created a deepfake of a famous singers voice and created a hit song with it, should that artist get royalties?
  - Their visual likeness or name was never used, just the voice
  - How is it different to other musical instruments people have invented?

- What if the publisher who owns the music rights to the back catalogue did it?
  - The deepfake was trained on the tracks THEY own the rights to

Sora

- Realistic Video Generation
  - Distinguishing real from AI-make video is becoming harder
- Copyright/IP Issues
  - ‘opt out’ policy
  - South Park
- Disinformation
  - Influence elections, mislead consumers, stoke tensions
- Deepfakes
  - ‘Cameos’
- Video is harder to moderate than text
- Legal and governance struggles to keep up in fast moving industry

Robin Williams' daughter Zelda hits out at AI-generated videos of her dead father: 'stop doing this to him'

Film-maker tells the public to stop sending her videos, saying: 'You're not making art, you're making disgusting, over-processed hotdogs out of the lives of human beings'

Example student question…

- I want to create a tool to help children with disability
- Aged between 13 and 18
- Children not physically and mentally capable of doing things by themselves
- Socially isolated and unable to make informed choices and decisions
- I have seen all these issues and want to create some form of technology that can help them with their communication and scheduling routines

What are the potential ethical issues here?

A Question I was asked as an undergrad…

- If you create a machine that is conscious. (sentient and aware of its own existence) is it ethical to then turn that machine off?

Summary

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- Discussed the Assignment Brief
- Discussed Ethics in computing projects
- Did some thought experiments around ethics
- Reviewed some examples of ethical issues in tech

The End

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