SOFTWARE ENGINEERING ESSAY

Version 1.0
BSc Computing for Games

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Introduction

In this assignment, you will research software engineering principles to bring an academic perspective to your working practice. Specifically, to explore:

(i) Which engineering challenges are prominent in game development;
(ii) and how software engineering principles are applied to digital games.

Working practices are important to employers in the games industry. Problems arising from poor software deisgn and ineffective quality assurance practices are largely avoidable. As such, the key principles of software engineering are widely used in the games industry. They are essential to learn. Additionally, research skills will help you with your professional development. Most critically, moving beyond textbooks and websites to the academic literature, which will help you to keep your skills up to date in the future.

This assignment is formed of several parts:

(A) **Write** a 200-word proposal **with** references which must:
  i. **state** a game engineering problem which you intend to address;
  ii. **describe** the way in which you intend to address the question;
  iii. and then **list** at least **10** appropriate academic references to use to support your research.

(B) **Present**, as a **group**, a 15-minute summary of your research that will:
  i. **clarify** each persons challenge area **and** final research question;
  ii. **debate** the most important principles based on your own research;
  iii. and **discuss how** these principles apply to working practice.

(C) **Write** a draft 1000-word essay which will:
  i. **address** the research queston;
  ii. and **analyse** which software engineering principles are the most important for your research area.

(D) **Write** a final 1000-word essay which will:
  i. **revise** any issues raised by your tutor and/or your peers.

Note: All research questions must be distinctive. Members of the same development group must **not** target the same research question.

"Program testing can be used to show the presence of bugs, but never to show their absence!"

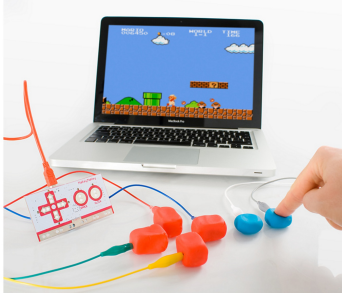
— Edsger Dijkstra

"Let us change our traditional attitude to the construction of programs. Instead of imagining that our main task is to instruct a computer what to to, let us concentrate rather on explaining to human beings what we want a computer to do."

— Donald Knuth

"A good way to stay flexible is to write less code."

— Andy Hunt & Dave Thomas



The *MaKey MaKey* allows a multitude of materials to be used to create videogame controllers.

Assignment Setup

This assignment is an **academic writing task**. Fork the GitHub repository at the following URL:

`https://github.com/Falmouth-Games-Academy/comp160-engineering`

Use the existing directory structure and, as required, extend this structure with sub-directories. Ensure that you maintain the `readme.md` file.

Modify the `.gitignore` to the defaults for **TeX**. Please, also ensure that you add editor-specific files and folders to `.gitignore`.

Part A

Part A consists of a **single formative submission**. This work is **individual** and will be assessed on a **threshold** basis. The following criteria are used to determine a pass or fail:

(a) Submission is timely;
(b) Research question is appropriate and distinctive;
(c) At least six academic peer-reviewed sources are cited.

To complete Part A, write your proposal in the `readme.md` document and then prepare the reference list using a `*.bib` file. Show these to your tutor. If acceptable, this will be signed-off.

You will receive immediate **informal feedback**.

Part B

Part B is a **single formative submission**. This work is **collaborative** and will be assessed on a **threshold** basis. The following criteria are used to determine a pass or fail:

(a) Research questions are adequetely addressed;
(b) Some evidence of academic rigor;
(c) Some insight into the relationship between theory and practice.

To complete Part B, prepare a presentation, and practice your debate and discussion. Prepare your slideshow collaboratively in TeX. Use the combined reference list of the group to broadly discuss each individual research question. Help each other. Ensure that the source code and related assets are pushed to GitHub prior to the scheduled session. Then, attend the scheduled session.

You will receive **peer feedback** within 3 working days after the session.

Part C

Part C is a **single formative submission**. This work is **individual** and will be assessed on a **threshold** basis. The following criteria are used to determine a pass or fail:

(a) Submission is timely;
(b) Enough work is available to conduct a meaningful review;
(c) A broadly appropriate review of a peer's work is submitted.

To complete Part C, prepare a draft version of the essay. Ensure that the source code and related assets are pushed to GitHub and a pull request is made prior to the scheduled session. Then, attend the scheduled session.

You will receive **peer feedback** within 3 working days after the session.

Part D

Part D is a **single summative submission**. This work is **individual** and will be assessed on a **criterion-referenced** basis. Please refer to the marking rubric at the end of this document for further detail.

To complete Part D, revise the essay based on the feedback you have received. Then, upload the essay to the LearningSpace. Please note, the LearningSpace will only accept a single `.pdf` file.

You will receive **formal feedback** three weeks after the final deadline.

Additional Guidance

Developing the research question is the most challenging aspect of this assignment. It is very unlikely that you will settle on the first research question that you propose. This is because the question will often arise out of your individual research and reading efforts. Furthermore, the question should relate to working practices for game developers. An example might be: "how can game developers make effective use of the daily scrum?". You will need to discuss your question with your tutor and your peers to help focus it.

Areas where students tend to lose marks are: depth of insight; analytical skill; and evaluative skill. Depth of insight implies rigorous research, addressing one key challenge in much detail, rather than several challenges with weaker research and/or in less detail. Adequete analysis implies going beyond mere descrption, perhaps through: performing calculatons, comparing sources, or even deploying reasoning to generate new insights. Adequete evaluation implies making appropriate reference to evidence and ensuring that evidence is of appropriate quality. Further to this, sound and valid arguments are constructed, criticising the claims made by other authors.

Focus on answering your research question. You have but 1000-words! Depth over breadth. Quality over quantitiy. Write concisely. Your ability to recall facts is not under assessment, your ability to construct an argument through critical analysis and making it relevant to practice is.

FAQ

- **What is the deadline for this assignment?**
  Falmouth University policy states that deadlines must only be specified on LearningSpace. Please examine the assignment area where you located this document.
- **What should I do to seek help?**
  You can email your tutor for informal clarifications. For informal feedback, make a pull request on GitHub.
- **Is this a mistake?**
  If you have discovered an issue with the brief itself, the source files are available at:
  `https://github.com/Falmouth-Games-Academy/bsc-assignment-briefs`.
  Please make a pull request and comment accordingly.

Additional Resources

- Keith, C. (2010) Agile Game Development with Scrum. Pearson Education.
- http://agilemanifesto.org/

Marking Rubric

Criterion	Weight	Refer for Resubmission	Basic Competency	Basic Proficiency	Novice Competency	Novice Proficiency	Professional Competency
Parts A—C	10% (Threshold)	Parts A—C have not been submitted, are incomplete, or are unsatisfactory.	Two parts incomplete.		One part incomplete.		Parts A—C are complete.
Appropriateness of Referenced Articles	10%	No relevant article is referenced.	At least three relevant sources are referenced.	At least six relevant sources have been referenced. Where appropriate, some sources report scholarly research.	At least eight relevant sources have been referenced. Where appropriate, most articles report scholarly research.	At least ten relevant sources have been referenced. Where appropriate, all sources report scholarly research. Some appropriate seminal and highly reputed sources have been referenced.	At least ten relevant sources have been referenced. Where appropriate, all articles report scholarly research. Many appropriate seminal and highly reputed sources have been referenced.
Relevance to and Focus on the Research Question	5%	No focus on the research question.	Little focus on the research question.	Some focus on the research question.	Much focus on the research question. Research questions are explicitly defined.	Considerable focus on the research question. Research question is explicitly defined. Conclusion explicitly refers back to the question.	Significant focus on the research question. Research question is explicitly defined. Conclusion explicitly refers back to the question.
Depth of Insight into Software Engineering Principles	20%	No depth of insight into software engineering principles.	Little depth of insight into software engineering principles.	Some depth of insight into software engineering principles. Insight highlights a specific engineering challenge in digital games development.	Much depth of insight into software engineering principles. Insight highlights a specific and relevant engineering challenge in digital games development.	Considerable depth of insight into software engineering principles. Insight explores, in detail, a specific and relevant engineering challenge in digital games development.	Significant depth of insight into software engineering principles. Critical insight that explores and/or addresses, in detail, a specific and pertinent engineering challenge in digital games development.
Specificity, Verifiability, & Accuracy of Claims	5%	No citations to evidence to claims. Substantial errors and/or misinterpretations.	Few claims have a clear source of evidence. Significant errors and/or misinterpretations.	Some claims have a clear source of evidence. Many errors and/or misinterpretations.	Many claims have a clear source of evidence. Some errors and/or misinterpretations.	Most claims have a clear source of evidence. Few errors and/or misinterpretations.	All claims have a clear source of evidence. Almost no errors and/or misinterpretations.
Adequacy of Analysis of Research Articles	20%	No analysis has been presented.	Little analysis has been presented.	Some analysis has been presented.	Much analysis has been presented.	Considerable analysis has been presented.	Significant analysis has been presented.
Adequacy of Discussion on Transfer to the Games Industry	15%	No transfer to the games industry.	Little transfer to the games industry.	Some transfer to the games industry. Appropriate references to the games industry and/or game development practice.	Much transfer to the games industry. Appropriate argument suggesting effective game development practice.	Considerable transfer to the games industry. Relevant criticism of game development practices, demonstrating insight into pitfalls and arguing for possible solutions.	Significant transfer to the games industry. Relevant criticism of game development practices, demonstrating insight into key pitfalls and effectively defending appropriate solutions with evidence.
Appropriateness of Academic Writing	5%	Little or no evidence of partial-mastery of academic writing. The reference section is missing.	Evidence of partial-mastery of academic writing. The reference section is incomplete and/or malformed.	Evidence of partial-mastery of academic writing. The reference section is complete and well-formed in either ACM or IEEE format. Most in-text citations and quotations are correct.	Some evidence of mastery of academic writing. The reference section is complete and well-formed in either ACM or IEEE format. All in-text citations and quotations are correct.	Much evidence of mastery of academic writing. The reference section is complete and well-formed in either ACM or IEEE format. All in-text citations and quotations are correct.	Considerable evidence of mastery of academic writing. The reference section is complete and well-formed in either ACM or IEEE format. All in-text citations and quotations are correct.
Appropriateness of Spelling & Grammar	5%	Substantial spelling and/or grammar errors.	Many spelling and/or grammar errors.	Some spelling and/or grammar errors.	Few spelling and/or grammar errors.	Almost no spelling and/or grammar errors.	No spelling or grammar errors.

Criterion	Weight	Refer for Resubmission	Basic Competency	Basic Proficiency	Novice Competency	Novice Proficiency	Professional Competency
Appropriateness of Essay Structure	5%	There is no structure, or the structure is unclear.	There is little structure.	There is some structure. A few sentences and paragraphs are well constructed.	There is much structure. Some sentences and paragraphs are well constructed. There is a clear introduction and conclusion.	There is much structure, highlighting the argument. Most sentences and paragraphs are well constructed. There is a clear and well-constructed introduction and conclusion.	There is much structure, highlighting the argument. All sentences and paragraphs are well constructed. There is a clear and well-constructed introduction and conclusion.