MODULE 3: SECURE SOFTWARE DEVELOPMENT

ASSIGNMENT 3

E-portfolio Submission

E-portfolio Link on Github:
https://pjneelam.github.io/pjneelam.eportfolio2022/#Module3

Submission Date: 21 February 2022

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Student: Neelam Pirbhai-Jetha

Question: Your e-portfolio content (1000 words) should be presented in a structured, logical way.

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1. A few words about me

Holder of degrees in French language and literatures, I live in the island of Mauritius and I have been teaching for the last sixteen years. In 2016/2017, I came across the field of digital humanities, which is at the intersection of the digital technologies and the humanities fields. In 2018, I initiated the setting up of a Centre for Digital Humanities at my university, and despite the support of computer scientist colleagues, I find that I am missing several important concepts in order to move forward with various projects. As a cross-disciplinary field, the 'digital humanities' tends to encourage an immersion in the field of computer science; and many arts and humanities research projects tend to use concepts of programming, artificial intelligence, natural language processing and big data among others.

The reasons that have made me enrol in a PG Certificate in Computer Science in 2021 are: i) become knowledgeable in the field of CS and ii) use this knowledge and know-how in my field (Mauritian/Francophone literature). ICT courses are, in my opinion, a prerequisite for all existing and future professional activities of the 21st century, and those in the humanities cannot continue to stay away from the various technological tools, which can enable them to work differently and more efficiently.

For a non-IT person, this seems a daunting experience, but starting with the core modules of the PG Certificate was the first stepping stones towards my objective of gaining fundamental knowledge in computer science, web development and programming that would lead me towards innovative and creative ideas and excellence in digital humanities research.

2. My reflections

In this e-portfolio I will go over what I have learnt in this third Module, my achievements, my main weaknesses and where I should improve. Created using an HTML5-UP template, my e-portfolio can be accessed on GitHub: https://pjneelam.github.io/pjneelam.eportfolio2022/#Module3

Gibb's Reflective Cycle (see Figures below) is used to explain my experiences, insights or understandings and evolution in this module:

2.1. On the importance of the module content

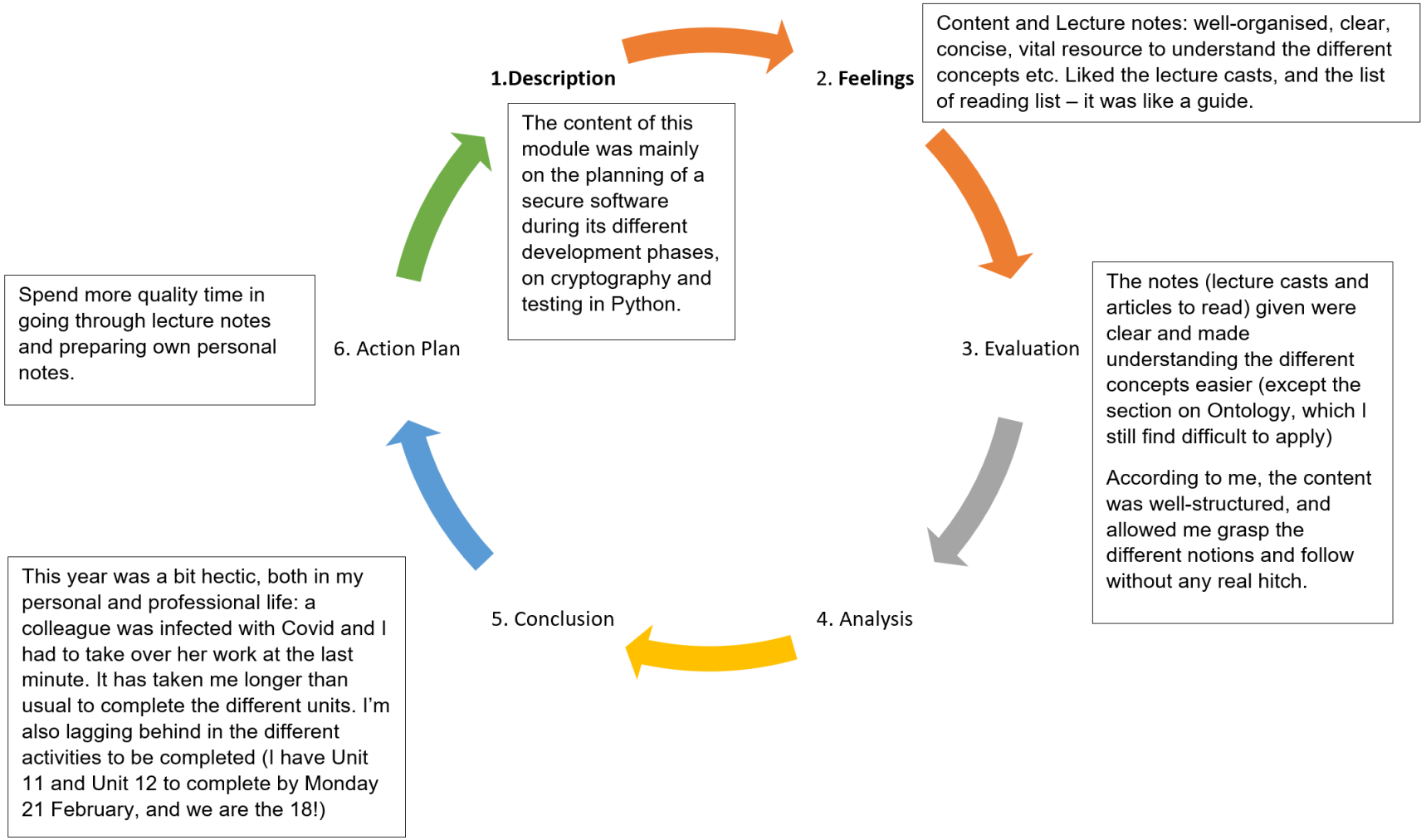


Figure 1: Reflections on The Module Content

2.2. On Academic Reading and Note Taking

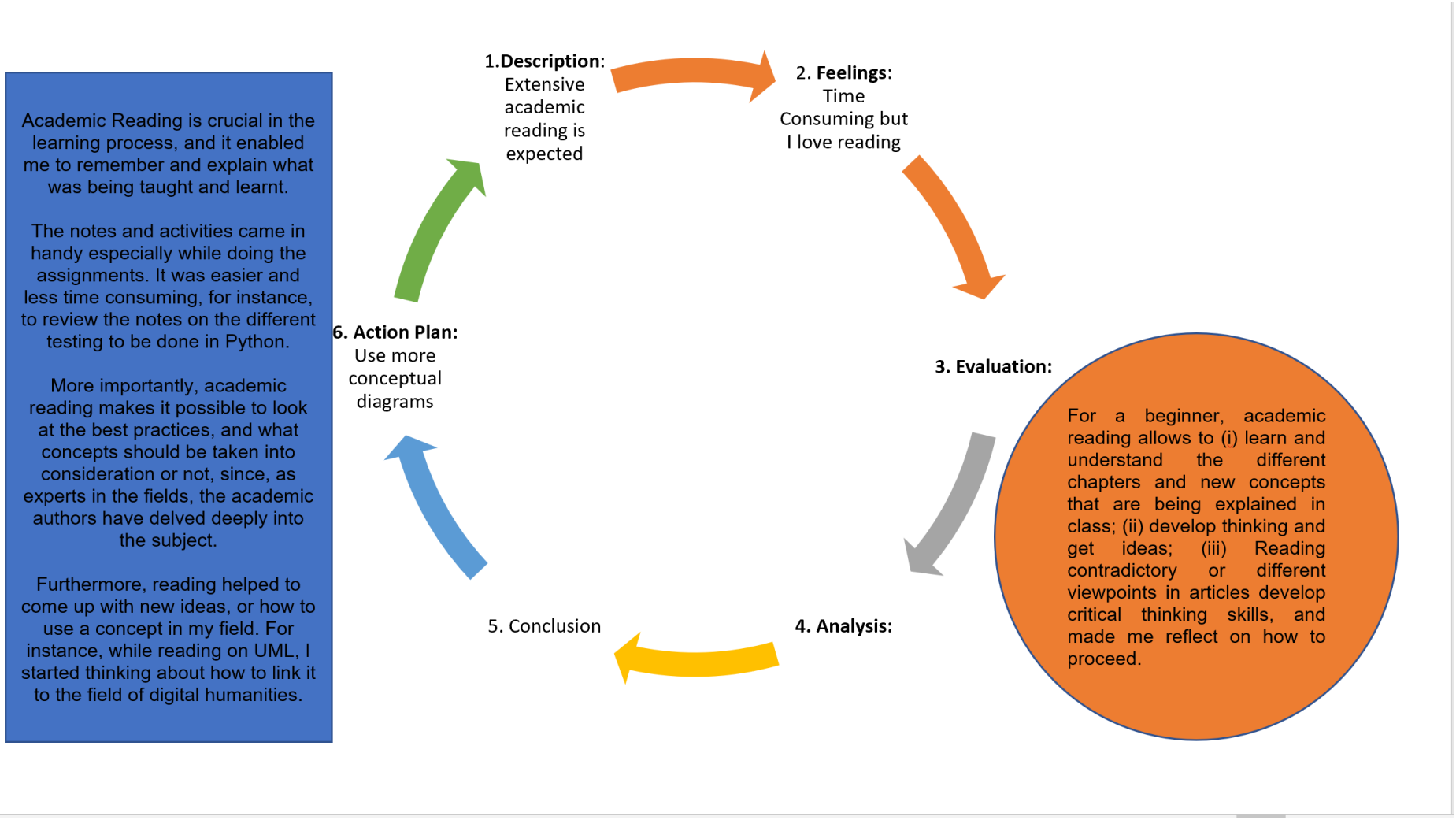


Figure 2: Reflections on Academic Reading and Note Taking

2.3. On Team Work

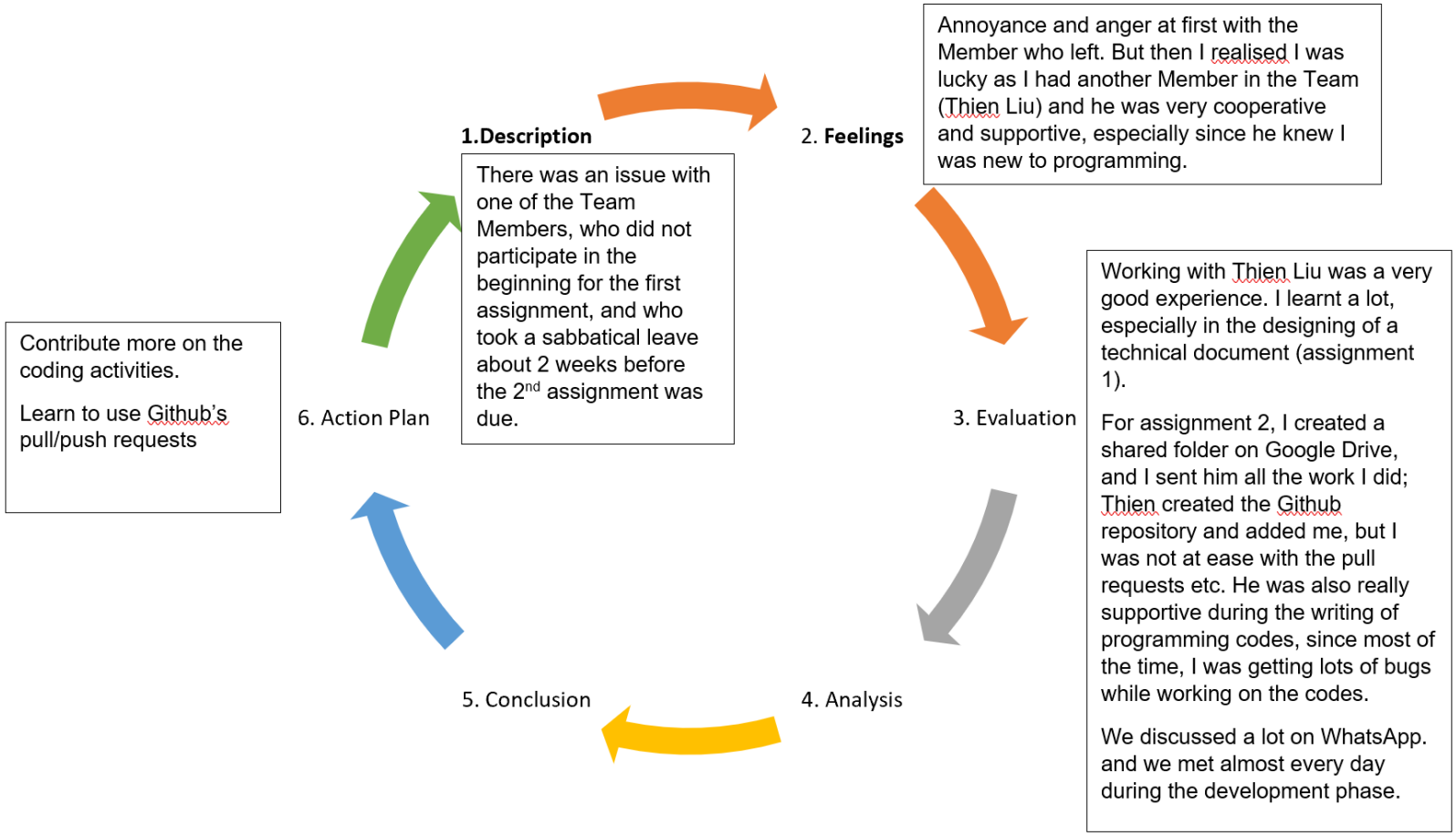


Figure 3: Reflections on Team Work

2.4. On Online Forum and Meetings with the Tutor

The forum is seen as a user-friendly platform that encourages reflection and interaction, and enables learners to be more independent, while collaborating with peers. While discussing about a specific topic, students are able to produce creative, reflective texts and also to receive feedback from their peers. The forum also allows learners to see the evolution of their thinking / discussion (Kuo et al., 2017).

For this module, due to some personal and professional commitments, I didn't have much time to participate actively in the forum activities. However, the meetings with the tutor were very helpful for me. I had a few issues understanding for example, the exercises on ontology and UML table. But, the tutor's insightful discussions/presentations made it easier to work on the activities after the explanation.

I also really appreciated the fact that she was 'present', responding promptly to all queries, meeting us personally if we did not understand something and sending personal messages on Moodle platform's chat almost every week, asking if everything was fine. This really helps to reduce the feeling of isolation and loneliness in an online course.

3. Summing up

3.1. Knowledge and skills acquired

The skills Matrix below was created to map the different skills and competences I have acquired.

Skills Matrix		
TECHNICAL SKILLS :	**Proficiency**	**Interest**
Concepts of secure software development (Confidentiality-Integrity-Availability concept and strategies of secure coding; the different Conventions and regulations to be followed (Pep8, Owasp, ISO), operating systems, recursion and towers of Hanoi etc.	2	1
Agile Methodologies and Secure Scrum (In Practice)	1	1
Regex (theory and Practice)	2	1
Logical & Algorithmic Thinking	2	1
HTML & CSS	2	1
Basic Python Programming	2	1
Intermediate/Expert Programming with Python	1	1
UML and Diagrams (Activity, state, sequence, ERD…)	2	1
Flask – web development	2	1
SQL	2	1
Testing (simple: Pylint, Flake8, McCabe, Radon)	3	1
Testing with pytest	1	1
APIs and creating an interactive shell	1	1
Cryptography and the use of the different algorithms to (de)crypt data	1	1
PROJECT MANAGEMENT SKILLS :		
Communication Skills	3	1
Time Management	3	1
Critical & Analytical Thinking	3	1
Manage a small IT project	2	1
Resilience	3	1
Interpersonal skills & Teamwork	3	1

Key to understand the scale:

Proficiency level:

0 = No capability

1 = Basic level

2 = Intermediate level

3 = Advanced level

Interest:

0 = Has no interest in applying this capability

1 = Is interested in applying this capability

Table 1: Skills Matrix

3.2. Room for improvement

My main objective is to following a career in digital humanities:

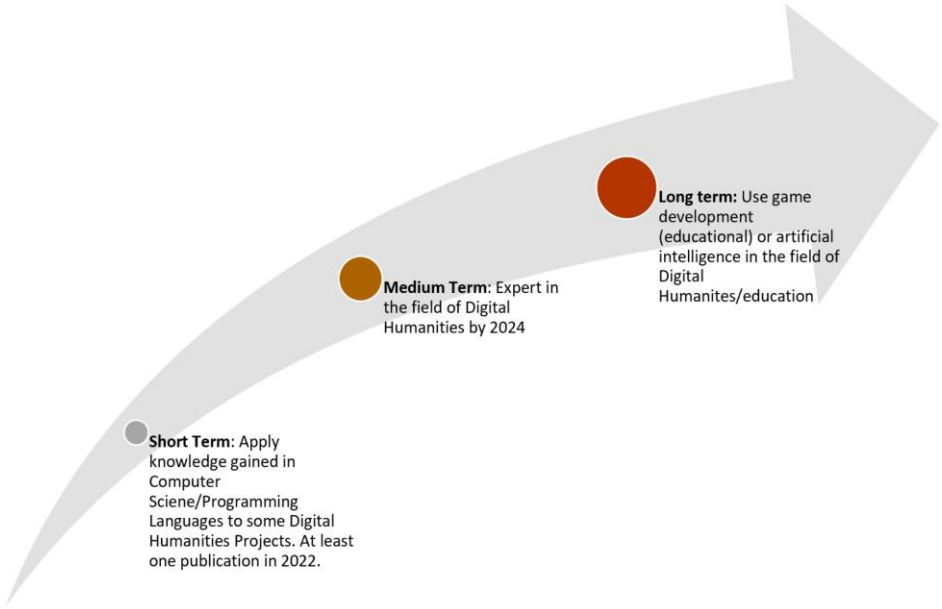


Figure 4: My Career Objectives

The Skills Matrix has made it possible to assess not only my competences and skills, but also my shortcomings. To become an expert in my field and to achieve my career objectives, I will, therefore, have to take action on how to improve. The table below gives a quick overview of actions to be taken:

Objectives/Goals (What do you want to be able to do or do better?)	Learn how to code professionally and use Python programming in any digital humanities project
Skills/Qualifications/Experience (What do you have or need to do in order to achieve this objective/goal?	Very little experience in coding (only three modules of the PG Certificate. More practical works in Python Programming needed
Gaps identified (What are the gaps between the skills you have and those that you need? Rank your current ability using the following scale**: A:** I demonstrate high levels of competence in this skill. **B:** I have this skill/competency, but some improvements could be made. **C:** I need to improve this skill/competency. **D:** I need to put in considerable work to develop this skill/competency. **E:** I have almost no experience with this competency.)	B-/C
Actions (What methods will you use to achieve the learning objectives? Give a target date (action step, to complete by…)	Focus more on Python for the next six months. A classmate (Michael Botha) has advised me to join the programming courses offered by the Python Institute/Open EDG.
Obstacles and Solutions (List any difficulties that you foresee. Think about how you'll overcome these, and, if necessary, add more goals.)	**Obstacle**: Time: Juggling with professional, personal and student life. **Solution**: Follow a strict work plan, and use python programming in a project. This will help to put into practice the concepts learnt in class (while working at the same time on a digital humanities (DH) project)
Success criteria (How will you recognise success? How will you review and measure your improvement? What criteria will you use to determine whether you have succeeded, and when and how will you measure this?	Ability to produce coding scripts on a DH project by myself To measure in six months: complete at least one digital humanities project in Python
Implementation (How will you practice and apply what you learn?)	Use Python in a specific project.

Table 2: Personal and Professional Development Plan

3.3. Personal and Professional Decisions

According to Tanmoy Chakraborty, "the problems at hand in computer science are now beyond the boundaries of any one single field" (Chakraborty, 2018: 8). In fact, "the human perspective" in a computer-based environment and the impact of ICT on individual human experience and on society at large cannot be underrated (Scheuermann & Kroeze, 2017); and since there is "a vast reservoir of resources almost unknown in the information sciences" (Scheuermann & Kroeze, 2017), the merging of the two fields (digital humanities and computer science) can lead to new, and innovative research.

All the modules I undertook made me gain more confidence in my decision to work in the digital humanities. I have therefore decided to take a sabbatical leave of a few months before continuing on the Postgraduate Diploma in Computer Science. I would like to improve on a few of my shortcomings, especially in coding with Python. I have, therefore, decided to engage myself fully into one Digital Humanities Project,

where I will use the skills, I have acquired in the PGCert. I am thinking of creating a repository of travel writing on Mauritius (from 1715 to 1968). The figure below is a brief visual representation of how the CS concepts will be used in this humanities project:

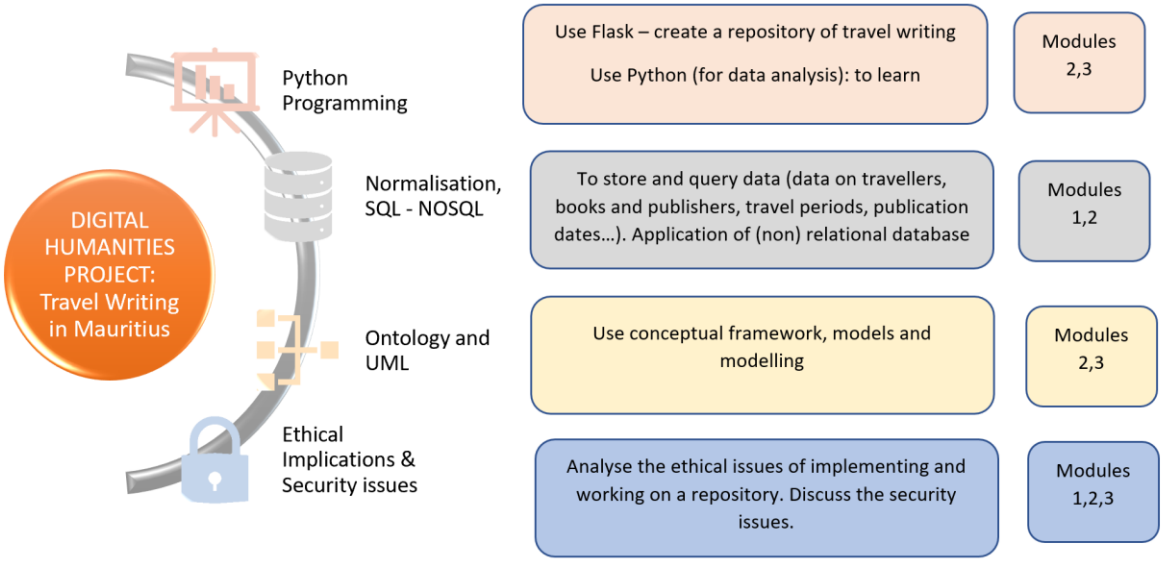
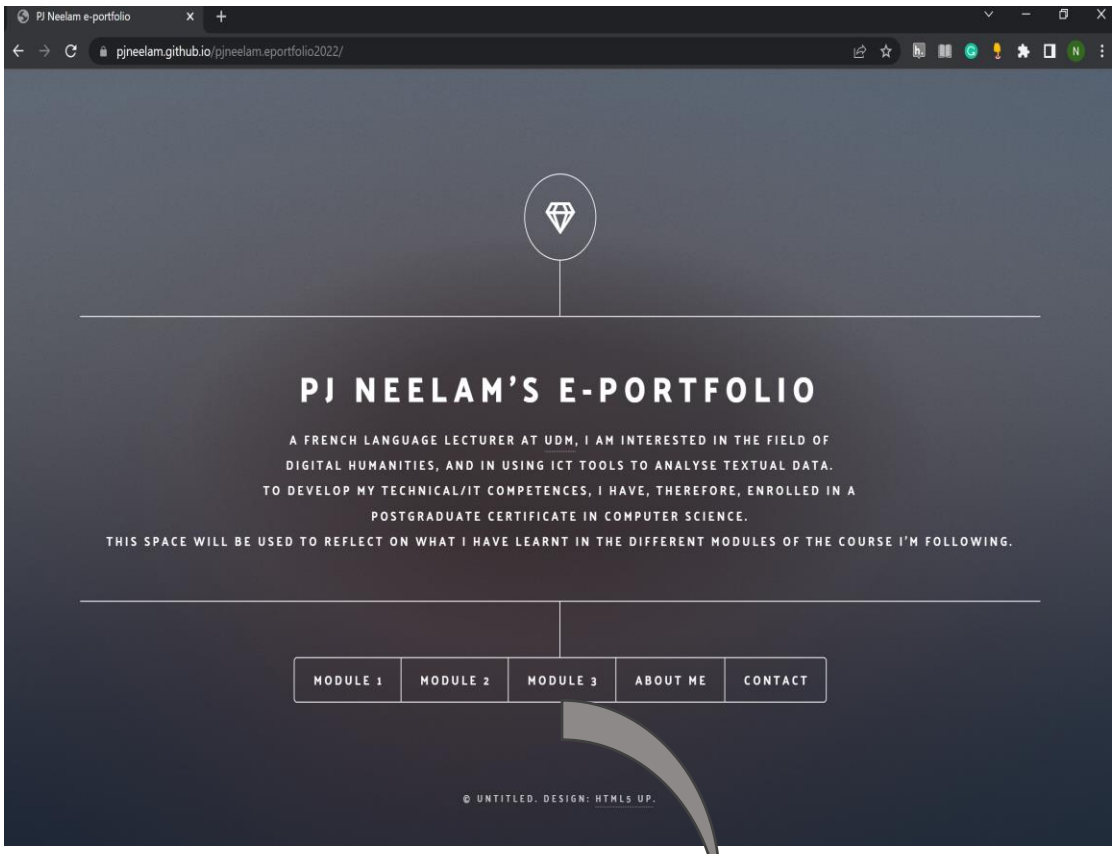


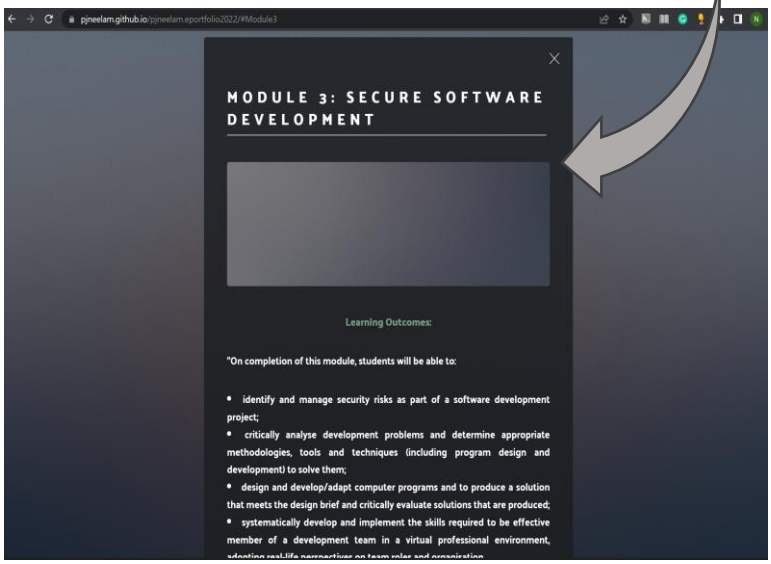
Figure 5: Applying concepts learnt in a digital humanities project

4. E-portfolio Screenshots

Below are the screenshots of some of the sections of my eportfolio. Module 3 can be accessed by clicking on the button on the homepage.

4.1. Homepage of the e-portfolio and Module 3 page





The Module page is divided into five main sections as shown below.

4.2. Module Notes

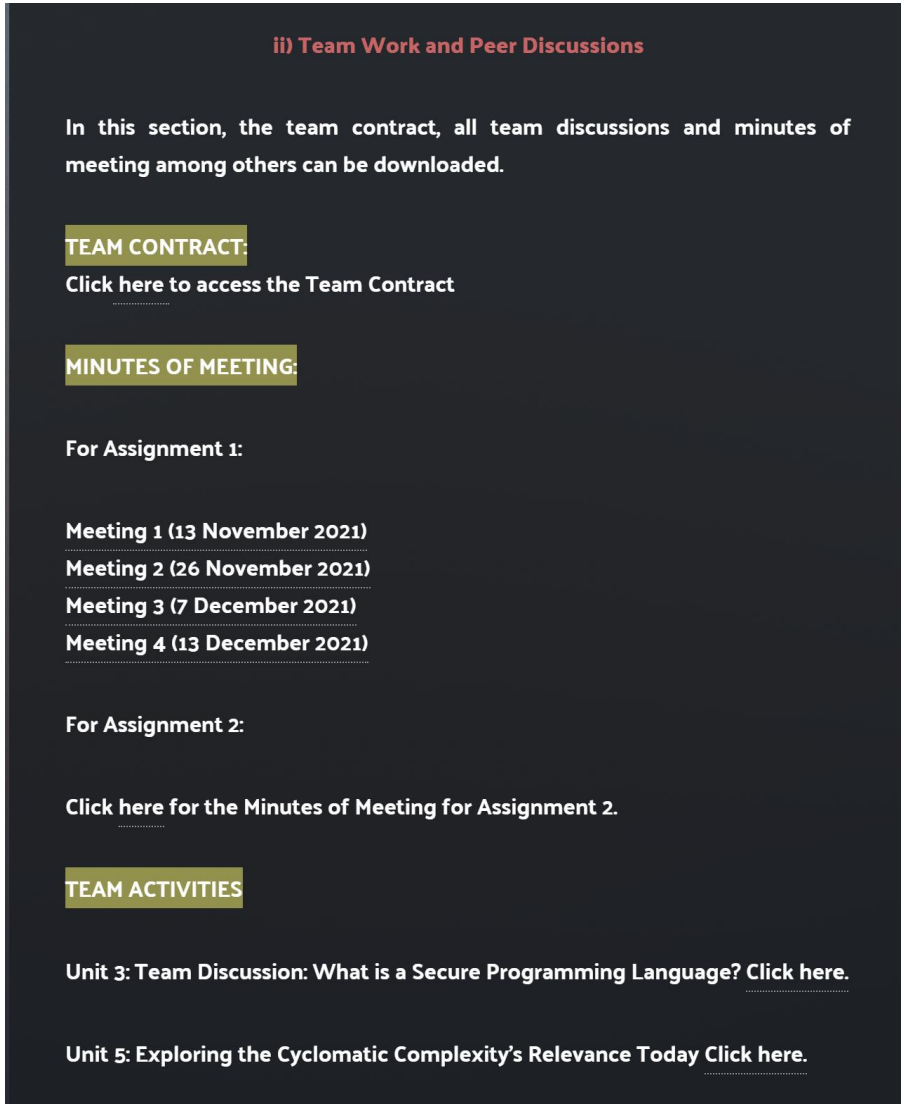
i) Module Notes

In order to understand the major concepts, I've decided to summarise and jot down what I've read and learnt in this section.

NOTES ON:	
Units	**Click below to access the notes.**
Unit 1: Introduction to Secure Software Development	Unit 1
Unit 2: UML Modelling to Support Secure System Planning	Unit 2
Unit 3: Programming Languages: History, Concepts & Design Unit 4: Exploring Programming Language Concepts	Units 3-4
Unit 5: An Introduction to Testing Unit 6: Using Linters to Support Python Testing	Units 5-6
Unit 7: Introduction to Operating Systems	Unit 7
Unit 8: Cryptography and its Use in Operating Systems	Unit 8
Unit 9: Developing an API for a Distributed Environment Unit 10: From Distributed Computing to Microarchitectures	Units 9-10
Unit 11: Future trends in Secure Software Development Unit 12: The Great Tanenbaum-Torvalds Debate Revisited	Units 11-12

Clicking on the unit will open the notes taken.

4.3. Team Work and Peer Discussions



ii) Team Work and Peer Discussions

In this section, the team contract, all team discussions and minutes of meeting among others can be downloaded.

TEAM CONTRACT:

Click here to access the Team Contract

MINUTES OF MEETING:

For Assignment 1:

Meeting 1 (13 November 2021)
Meeting 2 (26 November 2021)
Meeting 3 (7 December 2021)
Meeting 4 (13 December 2021)

For Assignment 2:

Click here for the Minutes of Meeting for Assignment 2.

TEAM ACTIVITIES

Unit 3: Team Discussion: What is a Secure Programming Language? Click here.

Unit 5: Exploring the Cyclomatic Complexity's Relevance Today Click here.

4.4. Posts, Works and Artefacts

iii) Posts, Works and Artefacts

The objective of this section is to keep track of all my posts, team discussions and the works (diagrams, models...) I did in this module.

Click on each unit below to get access the content:

COLLABORATIVE FORUM DISCUSSIONS

Collaborative Discussion 1 - UML Flowchart: Units 1-2-3

Collaborative Discussion 2 - Cryptography case study: TrueCrypt. Units 8-9-10

SEMINAR PREPARATION

Seminar 1 Preparation - Scrum Security Review Exercises - Table and Blog Post: Unit 2

Seminar 2 Preparation - Recursion and Regex: Unit 4

Seminar 3 Preparation - Testing with Python: Unit 6

Seminar 4 Preparation - Cryptography programming exercise: Unit 8

Seminar 5 Preparation - Developing an API for a Distributed Environment: Unit 9

Seminar 6 Preparation - Microservices and Microkernels Debate: Unit 11

CODING ACTIVITIES

Codio Activities:

i) Exploring Python tools and features: Unit 3

ii) Equivalence Testing in Python: Unit 5

Check Seminar 3 for the other Testing Activities done on CODIO

iii) Exploring a simple Python shell: Unit 7

All of the coding exercises (including those for the assignments) were done on Visual Studio Code. The python scripts I worked on can be accessed on my Github repository. Click here.

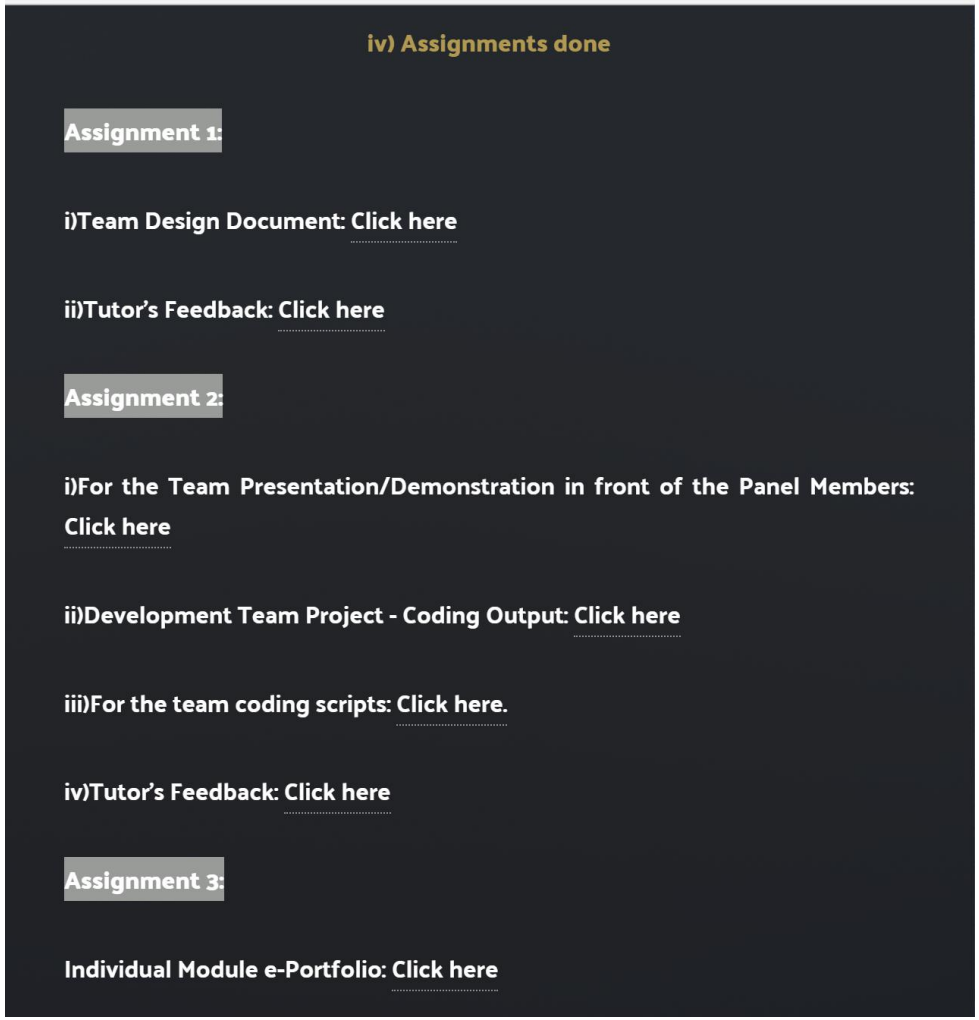
RESEARCH-READING ACTIVITIES

Programming Language Concepts: Unit 4

What is Ontology? : Unit 7

Faceted Data: Unit 10

4.5. Assignments done



4.6. My Personal Reflections and Self-Assessment

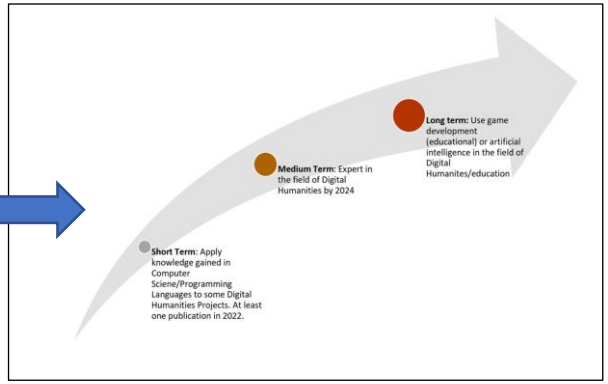
v) My Personal Reflections & Self-Assessment

When I embarked on the PG Certificate in Computer Science, I tried to prepare my short/medium/long term objectives. Click here to have a look at my Career Path.

After having completed this module, summarising what was achieved seems important. Assignment 3, which details my reflections, is available here.

The Skills Matrix I prepared gives an idea of the skills and competences I acquired or reinforced during this module. Click here.

The Personal and Professional Development Plan (PDP) below gives more details on the skills I need to improve on. My main weakness is skill coding. I will, therefore, have to work harder. Click here to have a look at my PDP.



No of words (without cover page, figures, tables, references): 979

5. References

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