Software Engineering Assignment 1

**Part 1**

1. **Explain what software engineering is and discuss its importance in the technology industry**.

Software engineering refers to the tools and techniques used to develop and maintain high quality software systems

Importance: Used to create and maintain applications and systems that are used in everyday life.

1. **Identify and describe at least three key milestones in the evolution of software engineering.**

Development of more complex and accommodating programming languages, e.g linux and now C++is used.

Evolution of the agile methodology: While the old agile systems focused solely on the waterfall system, inhibiting change during the process, the modern methodology accommodates continuous change and better processes.

The inception of structured programming like Python

The establishment of software engineering as a discipline

1. **List and briefly explain the phases of the Software Development Life Cycle.**

Requirements: Identify the purpose the software is to serve.

Design: Design the structure the software is to take up

Implementation: Implement the designs and create the website

Testing: Involves running the software and debugging where need arises.

Deployment: The software is made available to the users for use.

Maintenance: The software is continuously maintained and upgraded for easy use.

1. **Compare and contrast the Waterfall and Agile methodologies. Provide examples of scenarios where each would be appropriate.**

Waterfall: Involves a sequential process in which the software follows from development to deployment. It includes processes like the Software development life cycle.

Agile: Involves a process that is more flexible, collaborative among team members and responds easily to change like hybrid models.

1. **Describe the roles and responsibilities of a Software Developer, a Quality Assurance Engineer, and a Project Manager in a software engineering team.**

Software Developer: Writes code for the software and implements all software solutions.

Quality Assurance Engineer: Designs and executes all software test plans to ensure quality.

Project Manager: Oversees the software development process.

1. **Discuss the importance of Integrated Development Environments (IDEs) and Version Control Systems (VCS) in the software development process. Give examples of each.**

IDEs- These are systems that are used for writing and debugging code e.g. Visual Studio Code

VCS- Enable collaboration among developers and tracking changes made in the code e.g. Github

1. **What are some common challenges faced by software engineers? Provide strategies to overcome these challenges.**

Changing Requirements: Effective communication and using agile methodologies.

Tight Deadlines: Prioritization of tasks and continuous reassessments.

1. **Explain the different types of testing (unit, integration, system, and acceptance) and their importance in software quality assurance.**

Unit Testing: Testing individual modules or components of software e.g. add function

Integration Testing: testing interactions between different components or subsystems e.g.

System Testing: Testing the entire software as a whole e.g. testing process in SDLC

Acceptance Testing: Testing the software against user requirements.

**Part 2**

1. **Define prompt engineering and discuss its importance in interacting with AI models.**

Prompt Engineering: Crafting questions/statements to get the best possible responses from AI models. It helps improve the interaction between humans and AI.

1. **Provide an example of a vague prompt and then improve it by making it clear, specific, and concise. Explain why the improved prompt is more effective.**

Vague prompt: Tell me about cars

Improvement: What are the features that make a CX-5 a good car.