Software Engineering Day1 Assignment

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WHAT IS SOFTWARE ENGINEERING: This is the systematically application of Engineering principles , methods, and tools to develop and maintain high quality software systems. It also involves software product design development, testing development and maintenance.

Some of the importance of software engineering in technology industries are **By developing tailored software solutions,** technology industries **can optimize their operations, streamline processes, and gain a competitive edge**. Additionally, software engineering helps businesses manage data efficiently, analyse customer patterns, and make informed decisions that drive growth and profitability

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

Some of the key milestone s in the evolution of software engineering are

1: In 1968, The first NATO Software Engineering Conference was held

2: In 1970, A number of new methodologies are developed, including structured programming and object-oriented programming

3: In 1980, The first computer-aided software engineering (CASE) tools were released

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

The phases are, **planning, designing, development, testing, and deployment**.

Planning: This involve planning of the type of software to initiate. It is a critical phase.

Designing: This is where the pattern of the software design is determine

Development: in this phase, the design software is being develop to suite the particular purpose its made fore.

Testing: After the software is been develop, it is tested for proper working condition.

Deployment: When the software is fully ready and its function ability is certain and trusted, it will then be deploy into the general markets for public use and buying.

Compare and contrast the Waterfall and Agile methodologies

Agile is flexible and iterative, emphasizing continuous feedback and adaptation. Waterfall is sequential and rigid, with distinct phases completed in order. Agile promotes ongoing collaboration, while Waterfall focuses on thorough planning and execution in predetermined stages

examples of scenarios where each would be appropriate.

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Example Framework

Tech startup developing a mobile app Agile

Government software for public records Waterfall

E-commerce website redesign Agile

Construction of a new corporate office Waterfall

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

A SOFTWARE DEVELOPER ROLE: Is to **create and implement new software programs**. Maintain and enhance the functionality of the current software. With management and technical support colleagues, express yourself clearly and often. Create and maintain a software database.

A QUALITY ASSURANCE ENGINEER ROLE: Is to **design test plans, scenarios, scripts, or procedures**. Document software defects, using a bug tracking system, and report defects to software developers. Identify, analyze, and document problems with program function, output, online screen, or content

PROJECT MANAGER IN A SOFTWARE ENGINEERING TEAM: Is a crucial role responsible for **overseeing the planning, execution and delivery of software projects**. They align project objectives with business goals, manage resources and mitigate risks.

importance of Integrated Development Environments (IDEs) and Version Control Systems (VCS) in the software development process.:

VCS integration with IDEs **streamlines development processes through workflow automation, empowering teams to automate repetitive tasks and enhance productivity within their familiar development environment**

**Examples of [ IDES] :** Eclipse is an integrated development environment used in computer programming

Examples of [VCS]: Git is a distributed version control system that tracks versions of files. It is often used to control source code by programmers collaboratively developing

Mercurial is a distributed revision control tool for software developers. It is supported on Microsoft Windows, Linux, and other Unix-like systems, such as FreeBSD and macOS

Common Challenges faced by software engineers

Growing Customer Demands

Time Constraints

Limited Infrastructure

Software Testing Conflicts

Changing Requirements.

Limited Time and Resource

Security

strategies to overcome these challenges

To overcome the challenges associated with project deadlines and milestones, software engineers can employ several strategies. First and foremost, **effective project planning** is essential. Breaking down the project into smaller, manageable tasks with clear deadlines can help ensure progress is made consistently

The different types of testing (unit, integration, system, and acceptance) and their importance in software quality assurance.

In software testing, there are four levels of testing, such as: Unit testing: This is the first level of testing that determines whether or not software components fulfill functionalities. Integration testing: This is the second level of testing that verifies data flow from one module to another

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

Prompt engineering is the process of structuring an instruction that can be interpreted and understood by a generative AI model

importance in interacting with AI models

Prompt engineering **ensures that AI models produce accurate and relevant outputs**. It's the art of crafting effective prompts that guide the model's behavior, ensuring effective human-AI communication.

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

Examples of prompt in a Sentence

**“Did you hear me?” he prompted when his friend did not respond to his first question**. The actor had to be prompted by someone who was standing offstage. The computer prompted me to type in a number