**National University of Computer & Emerging Sciences, Karachi**

**Software Engineering Department**

**Quiz 02**

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| **Course Code: SE-1001** | **Course: Introduction to Software Engineering** |
| **Instructor: Iqra Fahad** | **Section: BSE – 2A** |
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**Question 01 [4]**

Compare and contrast MVC and layered architecture for system design. Which one would be better for an AI chatbot like chat GPT and why?

*MVC is an architectural pattern that separates an application into three interconnected components: the Model, which represents the data and business logic; the View, which handles the presentation of the data to the user; and the Controller, which handles user input and updates the model and view accordingly. The main advantage of MVC is that it provides a clear separation of concerns, making it easier to modify and maintain the different components of the application.*

*Layered Architecture, on the other hand, is an architectural pattern that separates an application into layers based on functionality. Each layer has a specific responsibility, and the layers communicate with each other through well-defined interfaces. The main advantage of layered architecture is that it provides a modular design, making it easier to manage and maintain the different components of the application.*

*When it comes to an AI chatbot like ChatGPT, both architectures could be used effectively. For example, the MVC pattern could be used to separate the data storage and retrieval (Model), the natural language processing and decision-making (Controller), and the response generation and presentation to the user (View). On the other hand, a layered architecture could be used to separate the user interface, business logic, and data access layers of the chatbot.*

*Ultimately, the choice of architecture depends on the specific needs of the project. If the focus is on providing a clear separation of concerns, MVC might be a better choice. If the focus is on providing a modular design, layered architecture might be a better choice.*

**Question 02 [3]**

What is Fitt’s Law? How is it linked to UI design?

*According to Fitts' Law, the time required to move to a target is a function of the distance to the target and the size of the target. Specifically, the law states that the time required to move to a target is proportional to the distance to the target and inversely proportional to the size of the target. This means that larger targets that are closer to the starting position are easier and faster to select than smaller targets that are further away.*

*In UI design, Fitts' Law can be used to improve the usability of interfaces by making frequently used targets larger and more prominent, and by placing them closer to the starting position of the user's input device (e.g., mouse, touch screen). For example, buttons that are frequently used in an application can be made larger and placed closer to the user's cursor, making them easier and faster to select. Similarly, links on a web page that are commonly clicked can be made larger and placed in prominent locations to improve their accessibility and usability.*

**Question 03 [3]**

In the Spiral model, what happens when you move outwards. Explain briefly with relation to UI design.

*In the Spiral model, moving outwards represents an increase in the level of detail and refinement of the design. As the team moves outwards, they work on developing a more detailed and comprehensive understanding of the user requirements and the system design. This may involve conducting user research, creating mockups and prototypes, and performing usability testing to gather feedback and refine the design.*

*With relation to UI design, moving outwards in the Spiral model means that the team is iterating on the design and adding more detail and refinement to the interface. For example, in the early stages of the project, the team may create rough sketches or wireframes to explore different design ideas and layouts. As they move outwards in the Spiral model, they may create more detailed mockups and prototypes to refine the design and test it with users. This iterative process allows the team to identify and address any usability issues and make incremental improvements to the interface over time.*