**Assignment 3: Research and compare SDLC models suitable for engineering projects. Present findings on Waterfall, Agile, Spiral, and V-Model approaches, emphasizing their advantages, disadvantages, and applicability in different engineering contexts.**

**1. Waterfall Model:**

* **Advantages:** Simple, linear structure promotes clear planning and documentation. Suitable for well-defined projects with stable requirements.
* **Disadvantages:** Inflexible, changes are difficult to incorporate later stages. Not ideal for projects with evolving requirements or high levels of uncertainty.
* **Applicability:** Good for projects with clear requirements upfront, like building a bridge with established specifications. Less suitable for innovative projects or those involving new technologies.

**2. Agile Model:**

* **Advantages:** Highly adaptable, allows for continuous feedback and iteration. Empowers teams to respond to changes efficiently.
* **Disadvantages:** Requires strong team communication and collaboration. May lack upfront planning and documentation for complex projects.
* **Applicability:** Excellent for projects with evolving requirements or those involving new technologies. Ideal for rapid prototyping and iterative development. Well-suited for software development but can be adapted for engineering projects with similar characteristics.

**3. Spiral Model:**

* **Advantages:** Combines elements of Waterfall and Agile, allowing for iterative development with risk management at each stage. Suitable for complex projects with high uncertainty.
* **Disadvantages:** Increased complexity compared to Waterfall. Requires skilled project management to balance risk mitigation and progress.
* **Applicability:** Ideal for large, high-risk engineering projects like developing a new aircraft. Useful for projects where requirements may evolve but a structured approach is still needed.

**4. V-Model:**

* **Advantages:** Emphasis on verification and validation throughout the lifecycle. Focuses on early defect detection and reduces rework.
* **Disadvantages:** Similar to Waterfall, less flexible for changing requirements. Requires upfront planning and detailed documentation.
* **Applicability:** Useful for safety-critical engineering projects with strict regulations. Good for projects where extensive testing and validation are crucial, like developing medical devices.