**1. Waterfall Model**

* **Advantages:** Simple, linear structure. Easy to understand and manage. Clear documentation at each stage. Suitable for well-defined projects with stable requirements.
* **Disadvantages:** Inflexible. Changes to requirements later in the process can be expensive and time-consuming. Limited user feedback until late stages.
* **Applicability in Engineering:** Good for projects with well-defined specifications, like building a bridge with fixed blueprints. Not ideal for projects with evolving requirements or significant uncertainty.

**2. Agile Model**

* **Advantages:** Highly adaptable. Encourages continuous feedback and iteration. Faster time-to-market.
* **Disadvantages:** Requires a strong and experienced team. Can be difficult to manage complex projects. Documentation can be less comprehensive.
* **Applicability in Engineering:** Suitable for projects with a high degree of uncertainty or evolving requirements, like developing a new prototype for a green energy solution.

**3. Spiral Model**

* **Advantages:** Risk-driven approach. Iterative development with risk mitigation at each stage. Combines elements of waterfall and agile methodologies.
* **Disadvantages:** More complex to manage compared to waterfall. Requires a strong understanding of risk management.
* **Applicability in Engineering:** Good for large-scale engineering projects with inherent risks, like developing a new aircraft model.

**4. V-Model**

* **Advantages:** Emphasis on validation and verification at each stage. Reduces errors through early testing. Suitable for safety-critical projects.
* **Disadvantages:** Similar to waterfall, less flexible for changing requirements. Requires a well-defined scope from the beginning.
* **Applicability in Engineering:** Ideal for projects with stringent safety requirements,