Activity 1: Software Processes

Why?

Every software development effort uses some process. We consider several of the most important models of software processes that have been proposed.

Learning Objectives

- Understand what a software process model is.
- Understand several important software process models.
- Understand the need for and procedure of evaluating software processes.

Success Criteria

- Be able to describe the waterfall, prototype evolution, spiral, and agile process models.
- Be able to list the advantages and disadvantages of these models.

Resources

Software Processes (pdf from Canvas)

Exercises

1. What is the difference between a software process and a software lifecycle process?

A software process is a process of developing a software product, but a lifecycle process is more complex, describing in detail the whole evolution of a product from its inception, through development, release, update, until it is no longer used.

2. What is a prototype?

A prototype is a working model of some or all of a finished product.
Types of prototypes:

- Throwaway prototypes
- Evolutionary prototypes

3. What is rework?

Rework is the repetition of effort in a project, discarding some portion of the work already done and redoing it for whatever reason.

Problem

1. Process models can be prescriptive or descriptive. If some organization sets out to use a particular software process in a project, is the process model descriptive or prescriptive?

   This process model would be prescriptive as the organization is setting out to do that meaning they are planning for how the software system should be developed

2. Which of the waterfall, prototype evolution, spiral, and agile processes are iterative? Which are incremental?

Type	Models
Iterative	spiral, agile
Incremental	waterfall

3. Which of the waterfall, prototype evolution, spiral, and agile processes are lightweight and which are heavyweight?

Agile processes are lightweight, while other models such as waterfall, prototype evolution, and spiral model are described as heavyweight.

4. The waterfall model is present in some sense in all subsequent software process models. Describe the role that the waterfall model plays in the prototype evolution, spiral, and agile models.

Models	The role of waterfall model
The prototype evolution	The prototype evolution model is essentially an iterative version of the waterfall model, repeating its processes continually in smaller parts.
Spiral	The spiral model draws out the rather simple waterfall model, iteratively with explicit handling of risks.
Agile	Agile models streamline processes and work more closely with the customers. It works in a similar way to the prototype evolution model, in implementing the same foundation as the waterfall model more iteratively.

5. List the advantages and disadvantages of each model in the table below.

Models	Advantages	Disadvantages
Waterfall	● Predictable ● Easy to estimate ● Easy to fix ● Documentation ● Distributable	● Requiring stable Req. ● Requiring complete & correct Req. ● Documentation ● Communication overhead ● Management ● Takes too long
The prototype evolution	● fast ● easily modified	● hard to predict

Models	Advantages	Disadvantages
Spiral	● explicit incorporation of increases in fidelity/detail ● explicit incorporation of risk ● one of the early iterative processes	● not very many people are trained in and good at risk management ● very general and adaptable, demands, expertise in tailoring software processes
Agile	● handle changes very well ● quick delivery of a working product to customer ● can recognize bad projects early (and cancel them) ● reduce waste and duplication of effort	● customers and users have to commit time and effort ● incremental design may not be a good thing ● difficult to use on large projects ● hard to predict outcomes