Homework 1 Software Engineering

Problem 1: Software engineer ethic

a. *(0.2 points)* John, manager of a software group takes government agents with their families to Disney land, Vegas and other touristic places to convince them to award a contract for his team. What ethics code of practice could have been violated?

Two ethics codes from the judgement principle are violated:

1. *A software engineer shall NOT engage in deceptive financial practices such as bribery, double billing, or other improper financial practices.*
2. *A software engineer should refuse to participate, as members or advisors, in a private, governmental or professional body concerned with software-related issues. This is because they, their employers, or their clients have undisclosed potential conflicts of interest.*

b. *(0.3 points)* Create a scenario where the management and colleague values are violated.

Management values violation
John, a software group manager, decides to assign work and duties to the employees without considering their skills and experience in the assigned roles.
Colleague value violation
John, a manager of a software group, rarely credits the work of others fully and always takes undue credit.

Problem 2: Process

a. *(0.9 points)* Provide 3 examples or applications where the waterfall process is more fit and 3 other examples where the incremental process is more useful. Explain your reasoning by highlighting the advantage of each process and its application.

Adapts to Shifting Teams: although not inherently unique to the waterfall approach only, adopting a waterfall approach in a project does permit the project to retain a more comprehensive and flexible scope and methodological framework owing to all the proactive preparation and documentation stages. This is especially best pertinent to large teams in which members are continuously changing throughout the project's life cycle.

Allows for Early Design Changes: Even though it can be challenging to design modifications later in the development, the waterfall model suits itself very well to revisions throughout the development process. In addition, his is useful when sorting things out in the specification documents in the first few stages with the design team and client, as adjustments can be made with little effort since no implementation has actually taken place up to that point.

Milestone-Focused Development: For projects with a linear structure, organizations or teams that operate well under a milestone- and data-focused paradigm are often better. With straightforward, concrete, and well-understood steps that everyone on the team can understand and plan for, it is reasonably easy to establish a timeline for the whole project and allocate particular markers and milestones for each stage and even completion.

b. *(0.9 points)* For building a new car model, Toyota decided to use the waterfall process. For each of the life cycle phases, list the precondition and activities and postcondition for each phase.

Phase	Requirement	Design and implementation	Verification and acceptance
Pre-Conditions	Requirement collection plan is available	Requirement specification document is available	System is already implemented (maybe still in beta stage)
Activities	Requirements discovery and understanding Requirements classification and organization Requirements prioritization and negotiation Requirements documentation	System modelling which includes: • Context models • Interaction models • Structural models • Behavioral models • Model-driven engineering coding	• Development testing • Test-driven development • Release testing • User testing
Post conditions	All activities are completed	Design document is produced System is implemented in actual programming language	All test plans are executed successfully

For problems 3 and 4

Consider a grocery online shopping application. This application allows users to shop from a contracted store. These stores can update their online store page with items, prices, coupons, and alternative items for items not always available. The user logins to their account, specify their geographical area, and access the contracted stores for that area. Once a store is selected, users can shop using the store online

page for items they need and select a delivery window of time. When an order is submitted, an employee will pick their list.

Problem 3: Scrum development

    a. *(0.9 point)* Create a backlog, then create a sprint plan for the online grocery application.

User Story	Activity	Days	Status
As a user. I can create account.	Design the user landing page	8	
	Design the user area	16	
	Meet with the user for the feedback	8	
	Design the UI	12	
	Automate tests	4	
	Code the pages	8	
As a user. I can login to my account.	Update security tests	6	
	Design a login page	12	
	Write test plan	8	
	Code the login logic	8	
As a user. I can access the contracted stores	Design the store access pages for the contracted stores	8	
	Meet with Mary about design	8	
	Design the checkout UI	12	
	Automate tests	4	
	Code the checkout page	8	
As a user. I can purchase item	Update security tests	6	

    b. *(0.3 points)* List 3 other activities needed for the development of the application.
- *Requirements engineering – which includes collection and analysis*
- *Design*
- *Implementation*

Problem 4: Requirements

a. *(0.3 points)* List 6 characteristics for a good requirement.
- *Unambiguous.*
- *Testable (verifiable)*
- *Clear (concise, terse, simple, precise)*
- *Correct.*
- *Understandable.*
- *Feasible (realistic, possible)*
- *Independent*

b. *(1.2 point)* Write 3 nonfunctional requirements for the grocery application and 3 user functional requirements and decompose those into 2 system requirements.

Functional requirements

- *The system should allow users to their account, specify their geographical area and access the contracted stores for that area*
- *The system should allow users to shop from a contracted store*
- *The system should allow users shop using the store online page for items they need and select a delivery window of time*

Non-functional

- *The system must be able to handle a large number of users concurrently*
- *Any attempts to gain unauthorized access to user accounts must be blocked*
- *Users must change the initially assigned login password immediately after the first successful login*