Asigment 01 BDSA group 26

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Github Link: https://github.com/kbekj/assignment-01-Group-26

1 Questions

1.1 Generics

For the first method the type constraint $whereT : IComparable < T >$; makes it so the type T has to implement the interface IComparable¡T¿ with the type T as parameter.

For the second method there's a naked type constraint on *where T:U* This type of argument means T must either derive or be identical to U.

2 Exercises

2.1 Exercise 1

1. The nouns and verbs are based on the application domain because it is a segment of reality for which a software system is developed. This means that we do not get any actual solutions, but we get an explanation of what the system should be able to do, once it is done. In this natural language specification, we use these nouns to specify which classes and attributes we need, to make the program whole. As well as using the verbs to specify what these classes should be able to do.

2. The libgit2sharp does not need the File or State class, because there is often a difference between the solution and application domain. It is not always that the application uses the same names and prosses as in the solution domain, and can look very different.

2.2 Exercise 2

Git is a *Interactive transaction-based applications*, because it's a interactive application which incorporates large amounts of data that is stored, access and updated with each commit, fork, branch or other actions on Git.
The Coronapas app is a mix of batch processing systems, as well as Interactive

transaction-based applications. Essentially, what the coronapas app must do, is to collect data on a citizen, and confirm or deny that person a coronapas. To do this, the app must collect health records, to determine if each person is allowed a pass or not. The system is also a kind of Interactive transaction-based application because the user must access the applications remotely, to gain the information, that is the coronapas.

2.3 Exercise 3

The Coronpas app is a *customized/bespoke software* due to the app implements software that are personalized depending on the user. An example of this is each user in Denmark, has to use their NemID/MitID to log in the app. Moreover, the information on the app has to show the vaccine history of the user in relation to covid-19. Git is a *generic product* due to git gives a wide range of possibilities for usage. Git isn't necessarily used for a specific purpose, however the majority of users on git use it for coding.

2.4 Exercise 4

In regards to quality attributes Corona Pas and the insulin pump has dependability and security as they both handle sensitive medical information of patients. Critically the insulin pump is dependable as a system failure could result in a person's death. It's also very important for the Corona Pas as millions relied on it every day for work or other activities.
Maintainability is important for Corona Pas as it was rushed out and no one knew what needs for the app would arise under a global pandemic. Git deals mainly in programming which is always evolving hence git need maintainability to keep up with new needs from the users.
Efficiency is most important for git as it improves the user experience and lowers system stress which is more important for a business like Git than government or health care systems. Which aren't in a competitive market.
Git and Corona pas needs high Acceptability as they are used by a large number of different people. Especially Corona Pas is used by everyone in Denmark and it should be easy to use for all of them.

2.5 Exercise 5

1. Gitlet does most likely not have any architecture, because it shows how git works under the covers. There is no architecture that can describe a description of something else

2. Git is built to work in a three-step process. First the working stage, where the programmer is writing the code. Next the staging part, where the programmer can add changes to the staging, and then get them ready for the commit. The commit is where the programmer finally adds the changes to the code or program.

3. Gitlet is implemented in JavaScript, and Git is implemented in C. Also, Gitlet only has functions and no classes

4. It is important that git works efficiently. If git had to explain what each commando does, it would not be a very effective tool. Gitlet is for those people, who wants to know more about what is going on behind the code of Git. Gitlet lets the users see what the commands actually does, as well as helping guide the user to the right commands.

2.6 Exercise 6

In the article *Softwareproblemer skadede mere end 100 patienter på amerikansk hospital* there's a veteran hospital that had a queue issue in their newly implemented program. The reasoning for this is that when the orders aren't filled in properly and get pushed to the unknown queue, then analysts are supposed to check the queue and see why the orders aren't routing correctly. However, due to this being a hospital and the workers having no knowledge of this, means those orders that were supposed to be checked, went unnoticed. To fix this, then you can make an error message if the order wasn't filled in properly so that it doesn't get pushed to the unknown queue. Moreover, if the order is forcibly pushed, then creating a new queue that saves the order but as an uncompleted order, still can be accessed. In the article, they write about implementing an error message, though, when writing orders it's imaginable that the doctors or nurses don't have to fill in every box. This means with a backup queue that is accessible for orders that aren't filled in completely, that there's a lower risk for the order to end up in the unknown queue. Additionally, the hospital could hire analysts that could look through the new queue. However, the following dilemma is how to manage the many patients that have been neglected due to system failure as well as the newer hospitalized patients. Another dilemma is, who is at fault for this kind of issue? On one hand, if the doctors or nurses had filled in the orders correctly then the unknown queue wouldn't have happened, and on the other hand, the programmers hadn't implemented the system with anything that could catch if the order was filled incorrectly.

In the article *Kodefejl i sundhedsplatformen: Fem patienter har fået forkert dosis medicin* several patients have gotten the wrong amount of medicine due to the code changes in the system. This resulted in a breach of the GDPR laws, where there was incorrect processing of personal data. Here the issue lies in the update in the system that hadn't been tested properly by the programmers, if this was the case they could've discovered defects and fixed them before delivering it to the client. The article talks about potentially having to hire people to consult to help the employee's in using the updated system. However, to lessen the chance of having the same issue, then the system has to be implemented and tested correctly, as well as doctors or nurses being able to learn how to handle the new update. Moreover, it mentions that no other update can happen unless the update doesn't interfere with other systems, so no false information is generated. Here the ethical dilemma lies in how to handle per-

sonal data correctly, but also how to treat the several patients that are affected by this update. Another dilemma is, when updating a system for a hospital, the doctors and nurses have to understand the new system. Therefore, having to put more time and effort into learning a refurbished system, that could've been used on the patients. Additionally, since it's a hospital, it's important to value the patients since any mistake could lead to further problems. Then if the doctors and nurses haven't been taught the system correctly, then there's a higher risk of making an error.