Assignment 1

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September 2021

1 Github

GitHub repository: **https://github.com/tkjelds/BDSA2021**

2 C# Generics

Compare the following two methods:

```
int GreaterCount<T, U>(IEnumerable<T> items, T x)
where T : IComparable<T>

int GreaterCount<T, U>(IEnumerable<T> items, T x)
where T : U
where U : IComparable<U>
```

Figure 1: Screenshot from the assignment

Both methods returns the amount of elements in *items* which are greater than x
Explain in your own words what the type constrain mean for both methods.

1. The type parameter T must implement the IComparable interface.
2. The type parameter T must implment U and U must implement the IComparable interface. This forces T to also implement the IComparable interface.

3 SE Exercises

3.1 Exercise 1

What is meant by "knowledge acquisition is not sequential"? provide a concrete example of knowledge acquisition that illustrates this

You might learn something that changes or invalidates something you had previously thought.

This is a normal occurrence in natural sciences where a theory is disproven, and a new is reinstated.

3.2 Exercise 2

Specify which of the following decision were made during requirement or system design.

1. The ticket distributor is composed of a user interface subsystem, a subsystem for computing tariff, and a network subsystem managing communication with the central computer **System design**
2. The ticket distributor will use PowerPc processor chips **Requirement**
3. The ticket distributor provides the traveler with an on-line help **Requirement**

3.3 Exercise 3

In the following description, explain when the term account is used as an application domain concept and when as a solution domain concept: "Assume you are developing an online system for managing bank accounts for mobile customers. A major design issue is how to provide access to the accounts when the customer cannot establish an online connection. One proposal is that accounts are made available on the mobile computer, even if the server is not up. In this case, the accounts show the amounts from the last connected session."

Application domain concept - "A major design issue is how to provide access to the **accounts** when the customer cannot establish an online connection."

Solution domain concept - "One proposal is that **accounts** are made available on the mobile computer, even if the server is not up. In this case, the **accounts** solution show the amounts from the last connected session."

3.4 Exercise 4

A passenger aircraft is composed of several millions of individual parts and requires thousands of persons to assemble. A four-lane highway bridge is another

example of complexity. The first version of Word for Windows, a word processor released by Microsoft in November 1989, required 55 person-years, resulted into 249,000 lines of source code, and was delivered 4 years late. Aircraft and highway bridges are usually delivered on time and below budget, whereas software is often not. Discuss what are, in your opinion, the differences between developing an aircraft, a bridge, and a word processor, which would cause this situation.

In Software Engineering there are difficulties that do not arise in the same way, when comparing to other engineering disciplines. This is best described in "No Silver Bullet Essence and Accidents of Software Engineering." by FP Jr, Brooks. (1987)

3.5 Exercise 5

Specify which of these statements are functional requirements and which are nonfunctional requirements:

1. "The TicketDistributor must enable a traveler to buy weekly passes." **Functional**
2. "The TicketDistributor must be written in Java." **Non-functional**
3. "The TicketDistributor must be easy to use." **Non-functional**
4. "The TicketDistributor must always be available." **Non-functional**
5. "The TicketDistributor must provide a phone number to call when it fails." **Functional**

3.6 Exercise 6

Reducing complexity by hiding unnecessary information.