Assignment 1

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Go to github repository
Link as text: https://github.com/nissemand243/Assignment_01

1 C#

1.1 Generics

Explain in your own words what the type constraints mean for both methods.

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

In this section T, must be of type IComparable<T>
U is unrestricted.

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

T is restricted to be of the same reference type as U
U is restricted to be of type IComparable<U>, hence T is also restricted to this.

2 Software Engineering

2.1 Exercise 1

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

Knowledge is nonlinear as new knowledge can contradict prior knowledge and making it invalid.

An example: Consider a business, dealing clothes, expanding its territory to Asia. Their initial business model, based on assumptions of Asians in general, predicts that Asian clothe sizes are approximately 2 sizes smaller than in Europe. After opening the shop in Asia, they test the business model, only to realise that their tests return false of their assumption, hence the non-linear knowledge acquisition

2.2 Exercise 2

Specify which of the following decisions were made during requirements 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

2.3 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: Assume you are developing an online system for managing bank accounts for mobile customers

Solution domain: 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.

2.4 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

As of bridges and aircrafts, costumer and developer tend to have some sort of common reference as of what it shall be used for, what the item has to be able to carry in workload and how long it shall be or how high it shall be able to fly. As of software, the costumer often times do not have internal knowledge about how much it will affect the program to make even the slightest of changes and since it is not a physical object, it can be altered after the completion of a version, in controversy to the bridges and aircrafts, which cannot be updated but only be redesigned and rebuild with the changes required.
This means that coming up with changes to the requirements of the software seems more accessible than coming up with changes to the requirements of bridges and hence the costumer is able to come up with more changes, that might interfere with the deadline and the budget of the software in controversy to the bridges and aircrafts.

2.5 Exercise 5

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

"The TicketDistributor must enable a traveler to buy weekly passes." - Functional

"The TicketDistributor must be written in Java." -Nonfunctional

"The TicketDistributor must be easy to use." - Nonfunctional

"The TicketDistributor must always be available." - Functional

"The TicketDistributor must provide a phone number to call when it fails." - Functional

2.6 Exercise 6

What is the purpose of modeling? Modeling reduces the complexity of a given problem therefore making it easier to analyse and define. In other words the purpose is to develop and maintain common grounds of understanding between the costumer and the developers making it easier to analyse, design, verify and validate the system.