

Software Engineering

Lesson #06 - Practice



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Agenda: Lesson #06 - Software Engineering - Practice

1 Deployment Diagrams

2 Use Cases Diagrams

3 Class Work

4 Q & A

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Deployment Diagrams

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Use Cases Diagrams

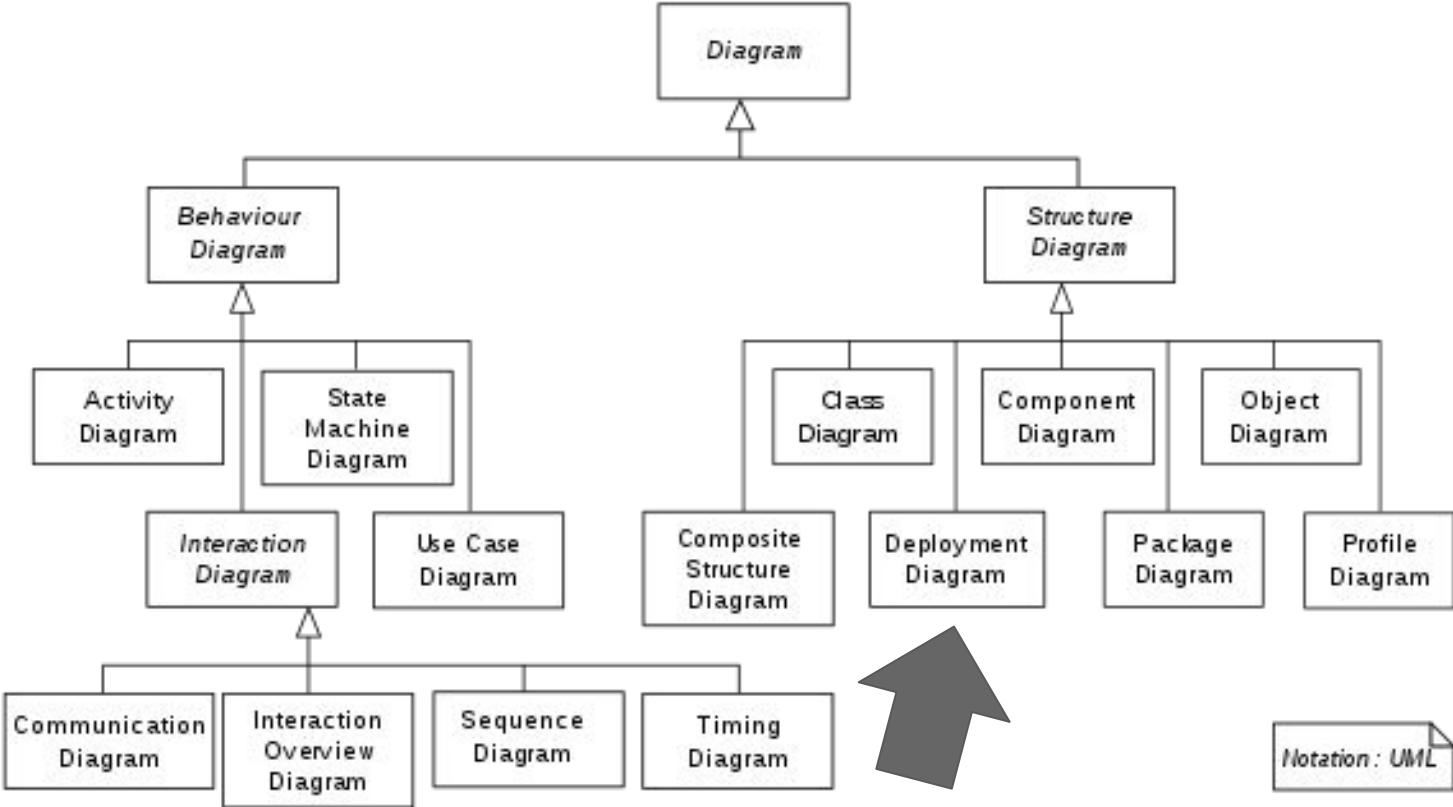
3

Class Work

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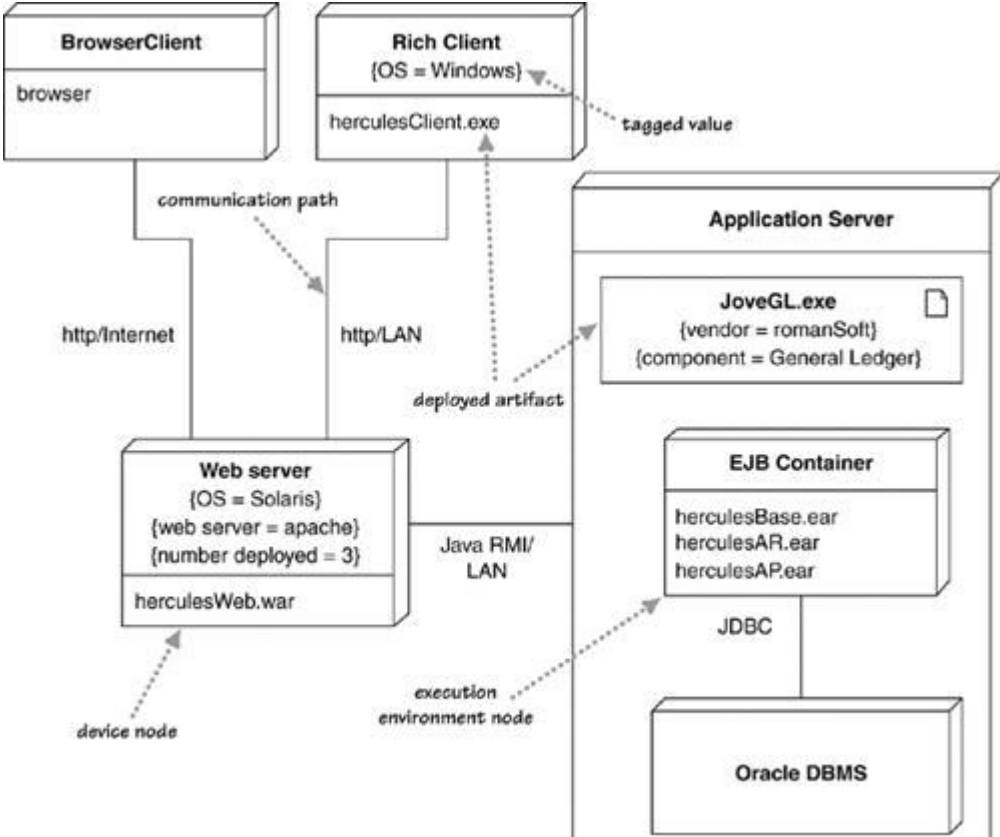
Q & A

Deployment Diagrams



Deployment Diagrams

Deployment diagrams show a system's physical layout, revealing which pieces of software run on what pieces of hardware



Deployment Diagrams

Deployment Diagrams

The main items on the diagram are nodes connected by communication paths

A node is something that can host some software

Deployment Diagrams

Deployment Diagrams

Nodes come in two forms

A device is hardware, it may be a computer or a simpler piece of hardware connected to a system

An execution environment is software that itself hosts or contains other software, examples are an operating system or a container process

Deployment Diagrams

Deployment Diagrams

The nodes contain artifacts, which are the physical manifestations of software: usually, files. These files might be executables (such as .exe files, binaries, DLLs, JAR files, assemblies, or scripts), or data files, configuration files, HTML documents, and so on

Listing an artifact within a node shows that the artifact is deployed to that node in the running system

Deployment Diagrams

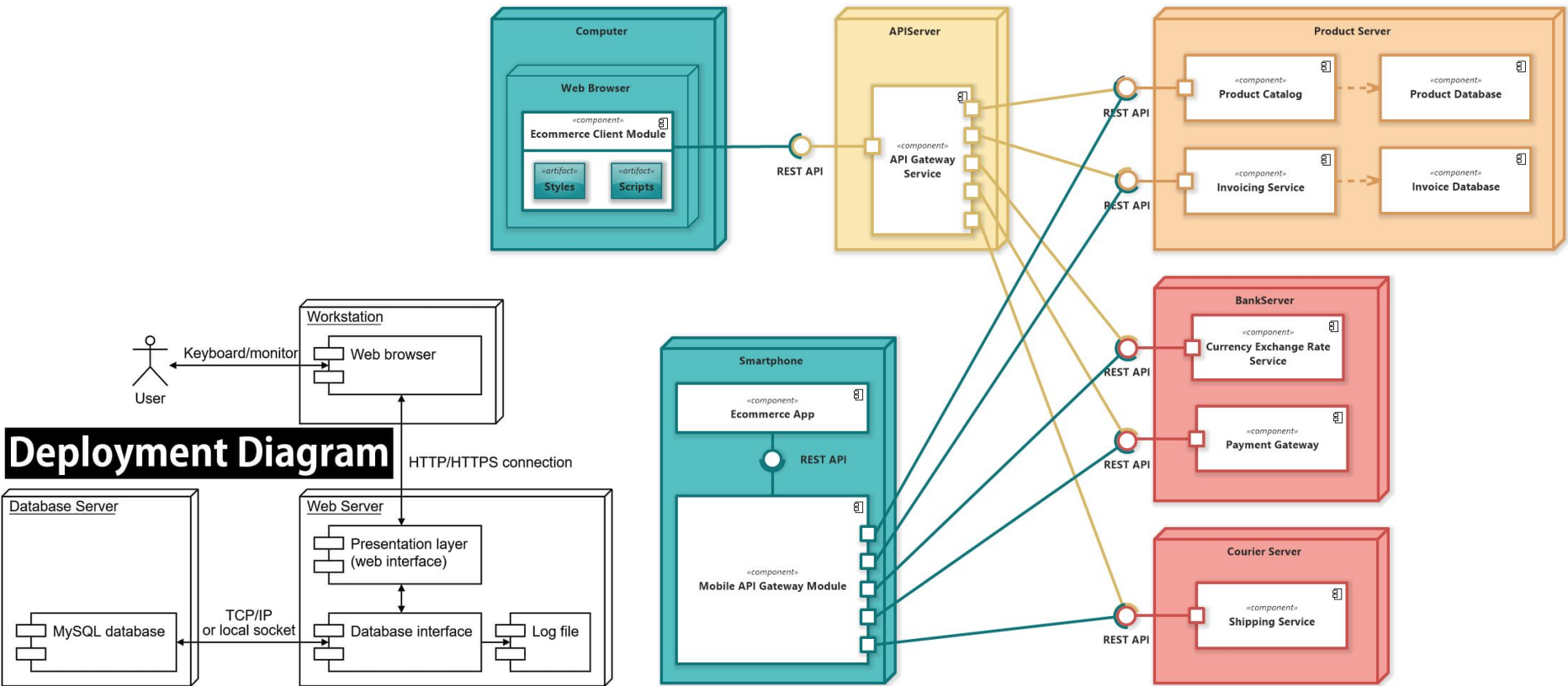
Deployment Diagrams

You can show artifacts either as class boxes or by listing the name within a node

If you show them as class boxes, you can add a document icon or the «artifact» keyword

You can tag nodes or artifacts with tagged values to indicate various interesting information about the node, such as vendor, operating system, location, or anything else that takes your fancy

Deployment Diagrams



Deployment Diagrams

When to Use Deployment Diagrams

They are very handy in showing what is deployed where, so any nontrivial deployment can make good use of them

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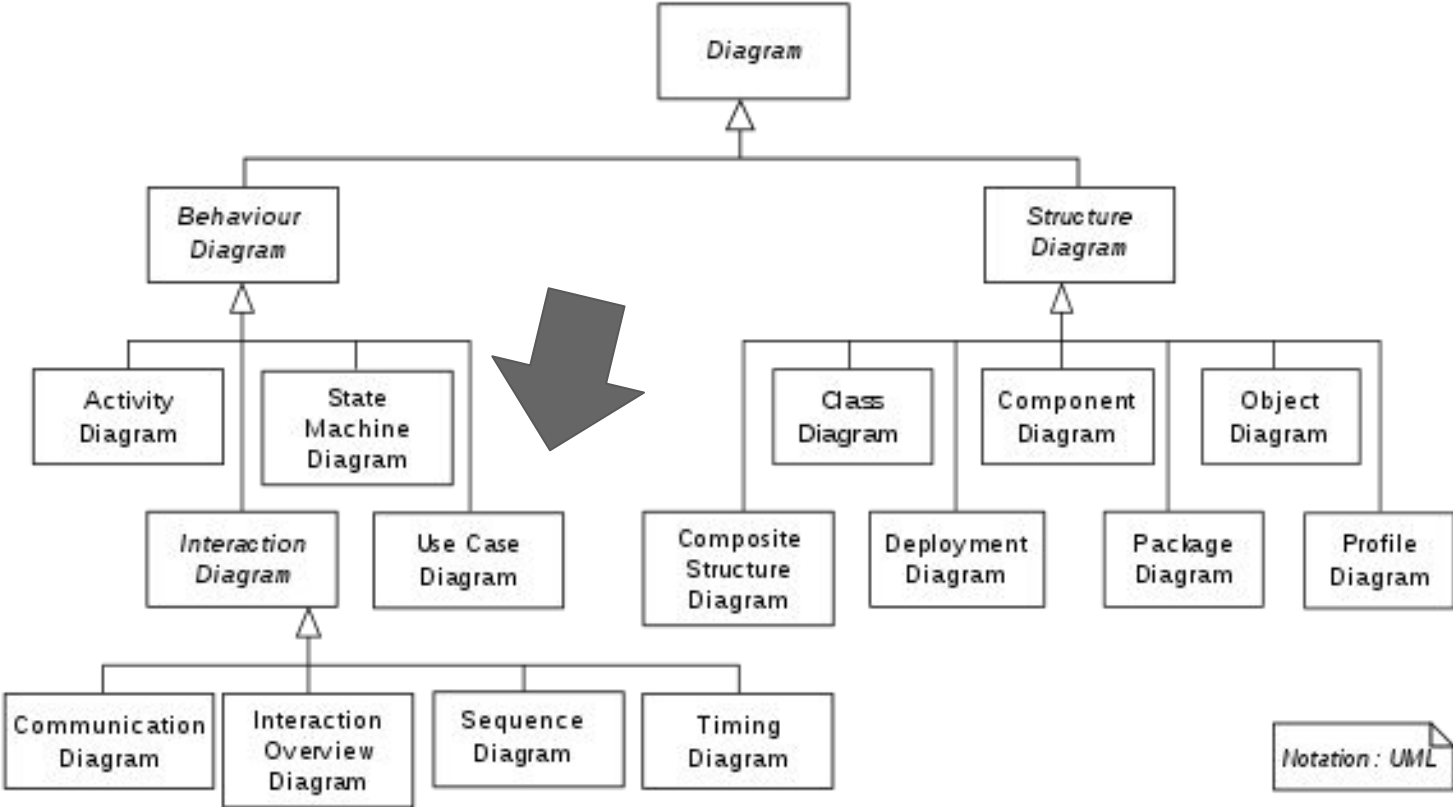
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Deployment Diagrams



Use Cases Diagrams

Use Cases Diagrams

Use cases are a technique for capturing the functional requirements of a system

Use cases work by describing the typical interactions between the users of a system and the system itself, providing a narrative of how a system is used

Use Cases Diagrams

Use Cases Diagrams

A scenario is a sequence of steps describing an interaction between a user and a system

This scenario is one thing that can happen. However, the credit card authorization might fail, and this would be a separate scenario

In another case, you may have a regular customer for whom you don't need to capture the shipping and credit card information, and this is a third scenario

Use Cases Diagrams

Use Cases Diagrams

All these scenarios are different yet similar

The essence of their similarity is that in all these three scenarios, the user has the same goal: to buy a product

The user doesn't always succeed, but the goal remains

This user goal is the key to use cases: A use case is a set of scenarios tied together by a common user goal

Use Cases Diagrams

Use Cases Diagrams

In use case - speak, the users are referred to as actors

An actor is a role that a user plays with respect to the system

Actors might include customer, customer service rep, sales manager, and product analyst

Use Cases Diagrams

Use Cases Diagrams

Actors carry out use cases

A single actor may perform many use cases; conversely, a use case may have several actors performing it

Use Cases Diagrams

Content of a Use Case

There is no standard way to write the content of a use case, and different formats work well in different cases

You begin by picking one of the scenarios as the main success scenario

Use Cases Diagrams

Content of a Use Case

You start the body of the use case by writing the main success scenario as a sequence of numbered steps

You then take the other scenarios and write them as extensions, describing them in terms of variations on the main success scenario

Use Cases Diagrams



SAMPLE

Buy a Product

Goal Level: Sea Level

Main Success Scenario:

1. Customer browses catalog and selects items to buy
2. Customer goes to check out
3. Customer fills in shipping information (address; next-day or 3-day delivery)
4. System presents full pricing information, including shipping
5. Customer fills in credit card information
6. System authorizes purchase
7. System confirms sale immediately
8. System sends confirming e-mail to customer

Extensions:

3a: Customer is regular customer

- .1: System displays current shipping, pricing, and billing information
- .2: Customer may accept or override these defaults, returns to MSS at step 6

6a: System fails to authorize credit purchase

- .1: Customer may reenter credit card information or may cancel

Use Cases Diagrams

Content of a Use Case

The best way to think of a use case diagram is that it's a graphical table of contents for the use case set

It's also similar to the context diagram used in structured methods, as it shows the system boundary and the interactions with the outside world

Use Cases Diagrams

Content of a Use Case

The use case diagram shows the actors, the use cases, and the relationships between them:

- Which actors carry out which use cases
- Which use cases include other use cases

Use Cases Diagrams

Levels of Use Cases

A common problem with use cases is that by focusing on the interaction between a user and the system, you can neglect situations in which a change to a business process may be the best way to deal with the problem

Often, you hear people talk about system use cases and business use cases

Use Cases Diagrams

Levels of Use Cases

The terms are not precise, but in general, a system use case is an interaction with the software, whereas a business use case discusses how a business responds to a customer or an event

Use Cases Diagrams

Use Cases and Features (or Stories)

Many approaches use features of a system—Extreme Programming calls them user stories—to help describe requirements

A common question is how features and use cases interrelate

Features are a good way of chunking up a system for planning an iterative project, whereby each iteration delivers a number of features

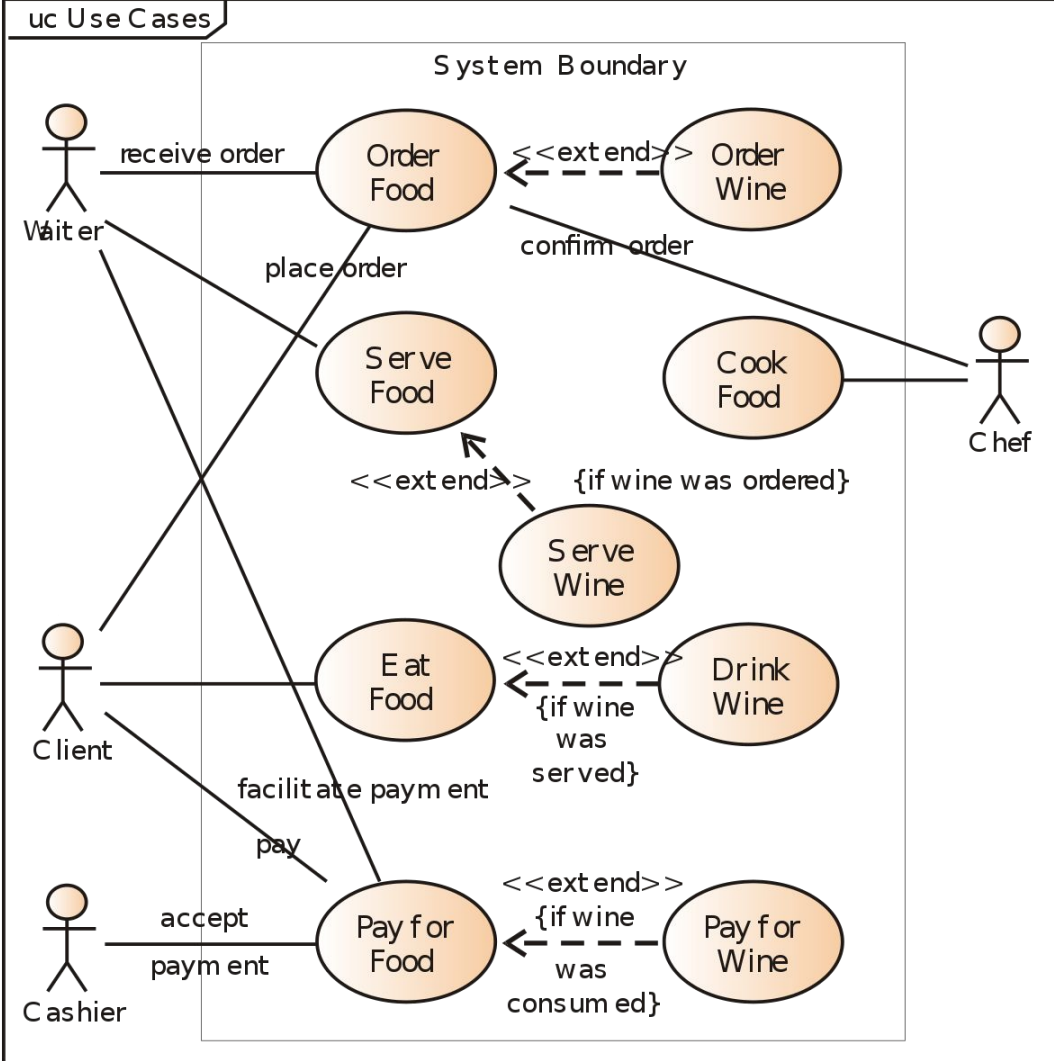
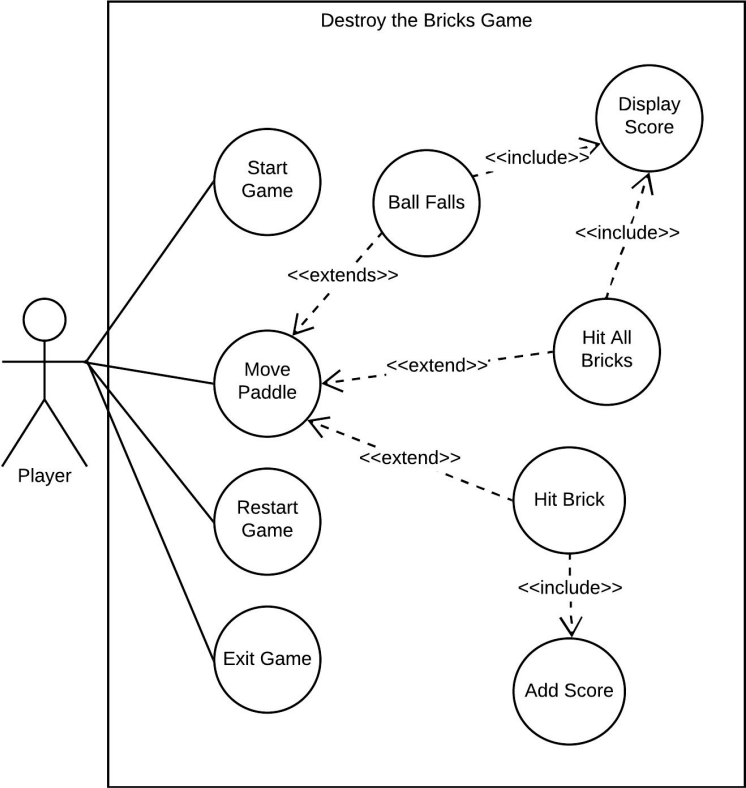
Use Cases Diagrams

Use Cases and Features (or Stories)

Use cases provide a narrative of how the actors use the system

Hence, although both techniques describe requirements, their purposes are different

Use Cases Diagrams



Use Cases Diagrams

When to Use Use Cases

Use cases are a valuable tool to help understand the functional requirements of a system

A first pass at use cases should be made early on

More detailed versions of use cases should be worked just prior to developing that use case

Use Cases Diagrams

When to Use Use Cases

It is important to remember that use cases represent an external view of the system

As such, don't expect any correlations between use cases and the classes inside the system

Use Cases Diagrams

When to Use Use Cases

The more I see of use cases, the less valuable the use case diagram seems to be

With use cases, concentrate your energy on their text rather than on the diagram

Despite the fact that the UML has nothing to say about the use case text, it is the text that contains all the value in the technique

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Class work

Software Engineering, 10. Global Edition

At the end of class, please, send your work to
z.aldamuratov@kbtu.kz, indicating
Software Engineering Practice #06 & your surname and name

Tool: StarUML



- Please review software system for University application (WSP). Please review use cases based on different user types. Please model University application with Use-Case diagrams.

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