Lecture 5

Introduction OOAD

Agenda

- Compare and contrast analysis and design.
- Define object-oriented analysis and design (OOA/D).
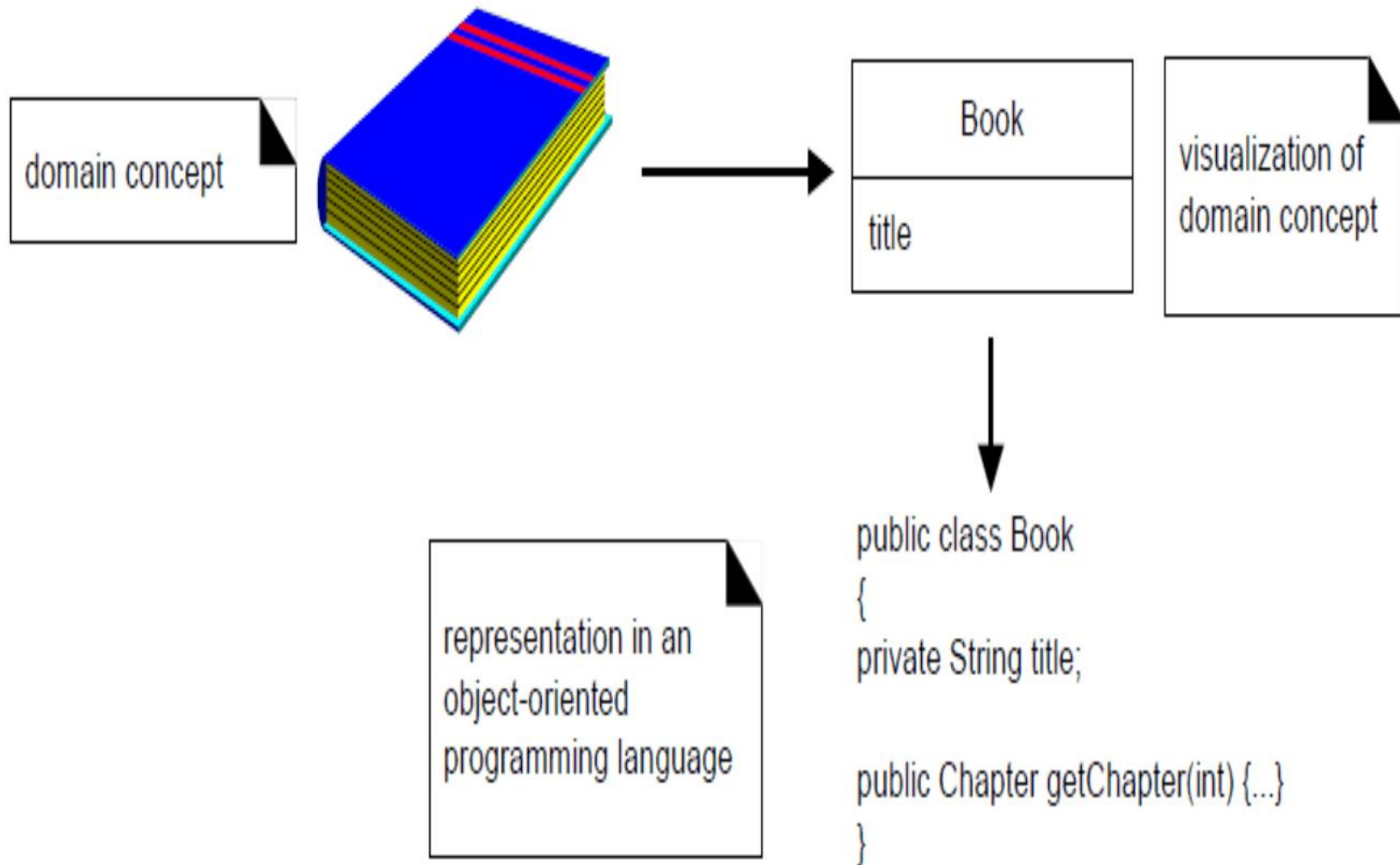- Illustrate a brief example.

Analysis

- **Analysis emphasizes an *investigation of the problem and requirements, rather* than a solution.**

- For example, if a new computerized library information system is desired, how will it be used?

- "Analysis" is a broad term, best qualified, as in *requirements analysis (an investigation* of the requirements) or *object analysis (an investigation of the domain* objects).
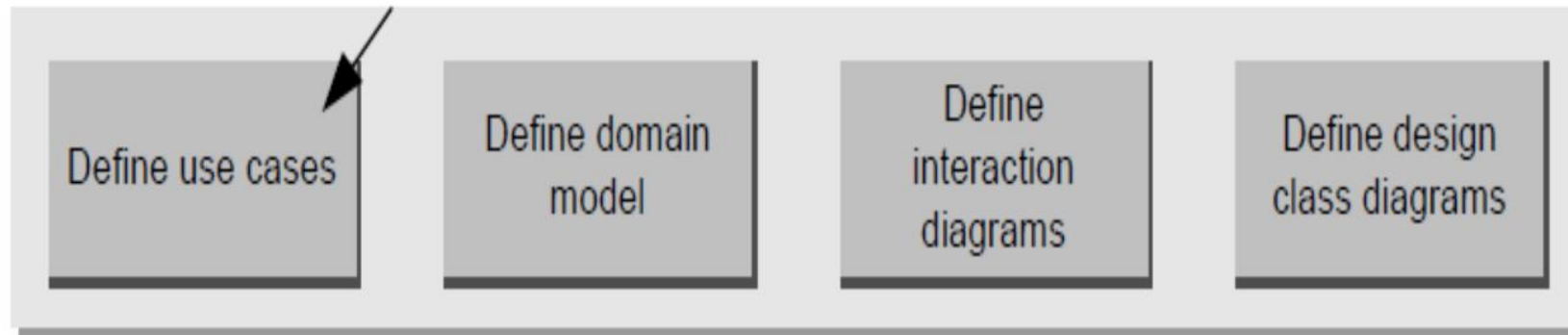
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Design

- **Design emphasizes a *conceptual solution that fulfills the requirements, rather*** than its implementation.

- For example, a description of a database schema and software objects. Ultimately, designs can be implemented

What Is Object-Oriented Analysis and Design?

- **object-oriented analysis, there is an emphasis on finding and describing** the objects—or concepts—in the problem domain.

- For example, in the case of the library information system, some of the concepts include *Book, Library,* and *Patron.*

- **object-oriented design, there is an emphasis on defining software** objects and how they collaborate to fulfill the requirements.

- For example, in the library system, a *Book software object may have a title attribute and a getChap-ter method*

domain concept

Book

title

visualization of
domain concept

representation in an
object-oriented
programming language

```
public class Book
{
private String title;

public Chapter getChapter(int) {...}
}
```

Overall Picture of OOAD

Define use cases	Define domain model	Define interaction diagrams	Define design class diagrams

Define Use cases

- Use cases are not an object-oriented artifact—they are simply written stories.

- However, they are a popular tool in requirements analysis and are an important part of the Unified Process.

- For example, here is a brief version of the *Play a Dice Game use case:*

  - **Play a Dice Game: A player picks up and rolls the dice. If the** dice face value total seven, they win; otherwise, they lose.
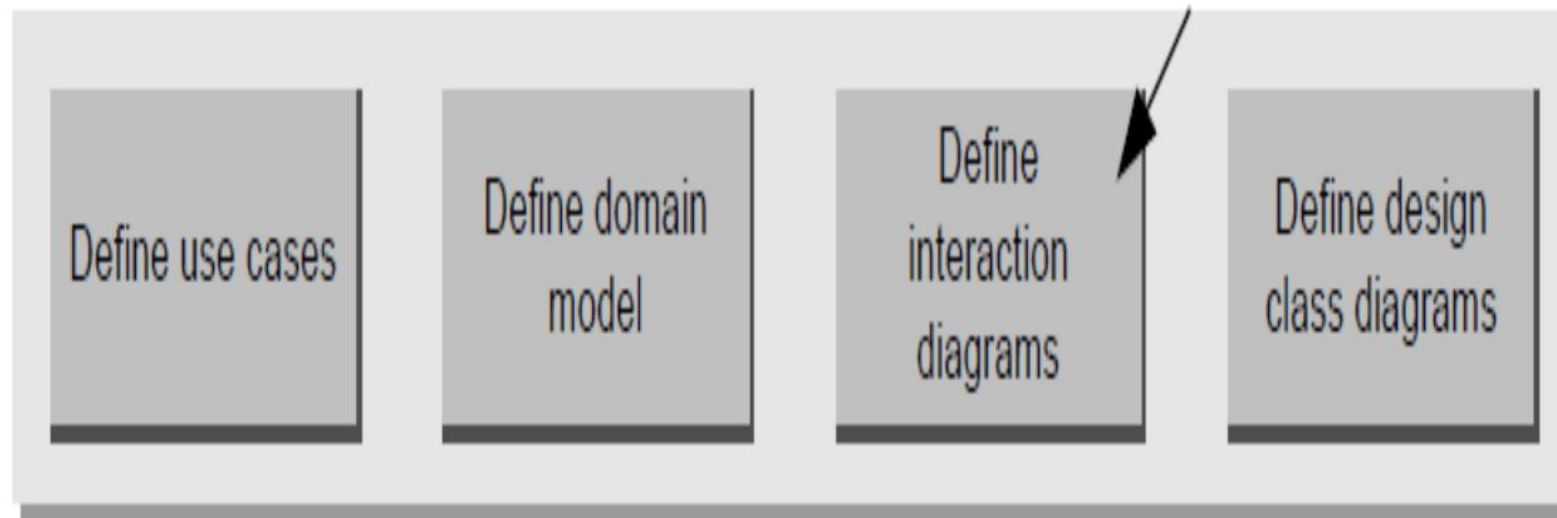
Define a Domain Model

- A decomposition of the domain involves an identification of the concepts, attributes, and associations that are considered noteworthy.

- The result can be expressed in a **domain model, which** is illustrated in a set of diagrams that show domain concepts or objects.
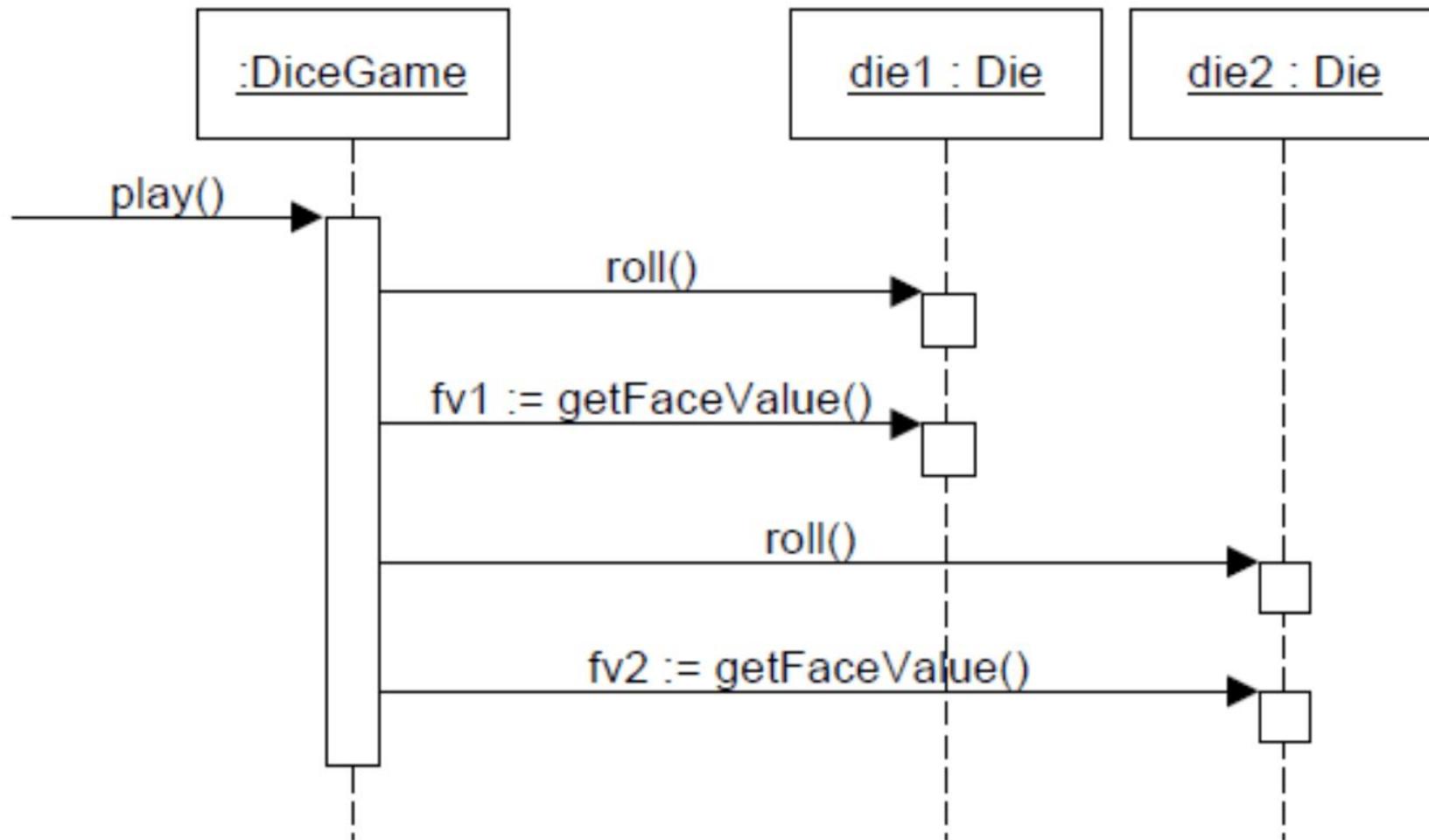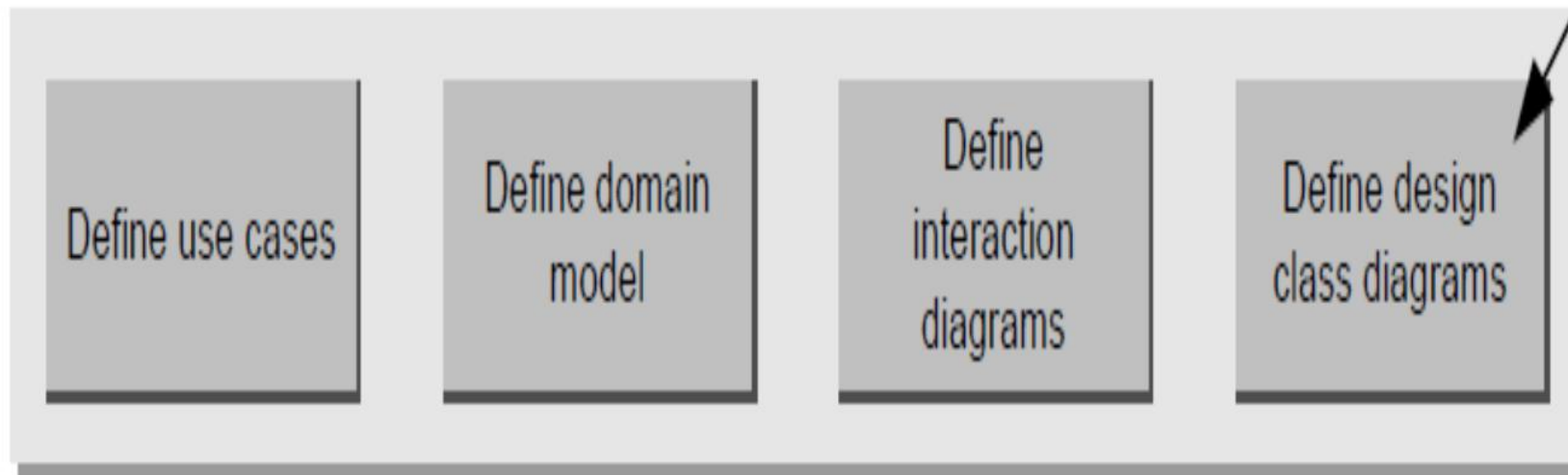
Partial domain model of the dice game.
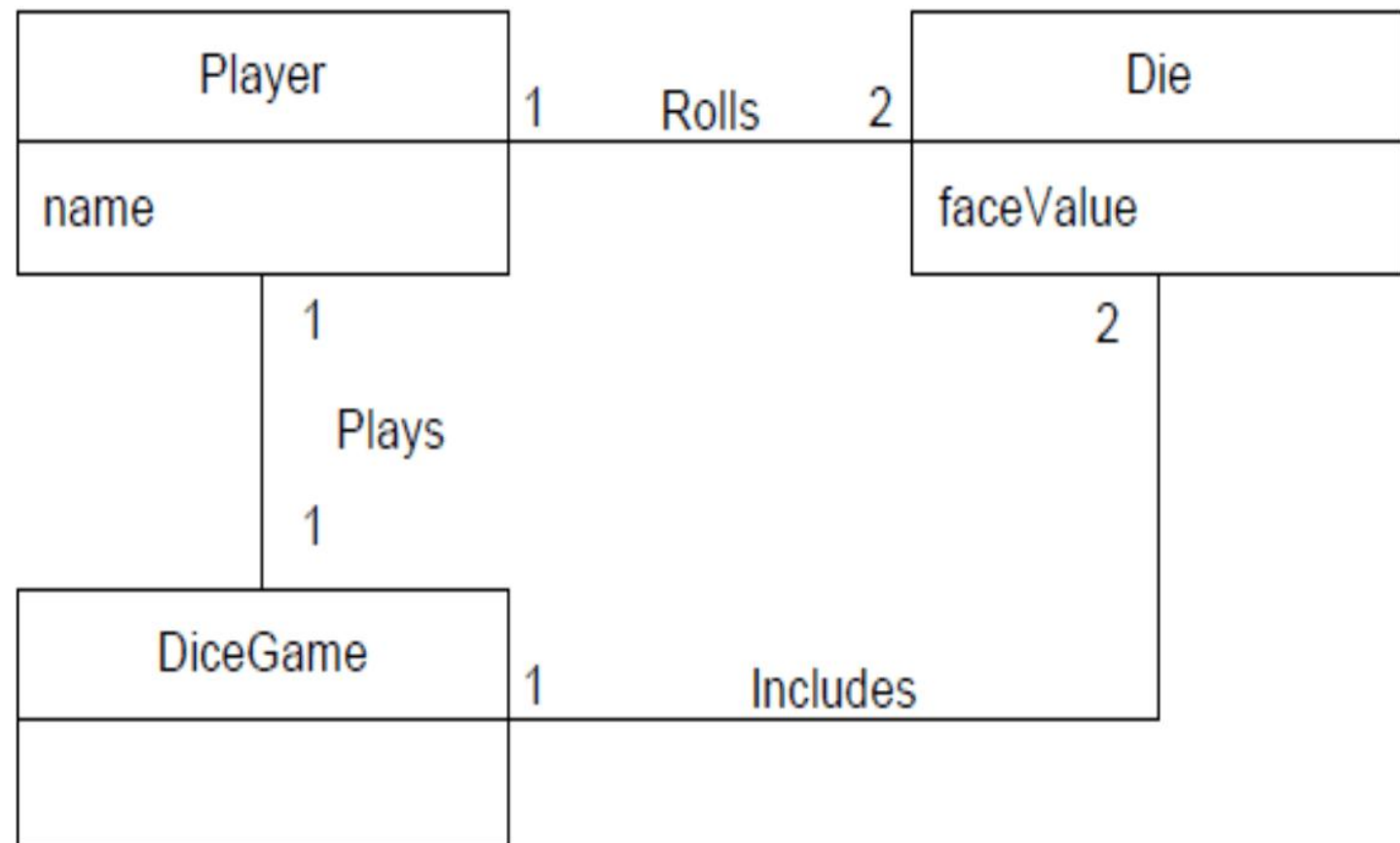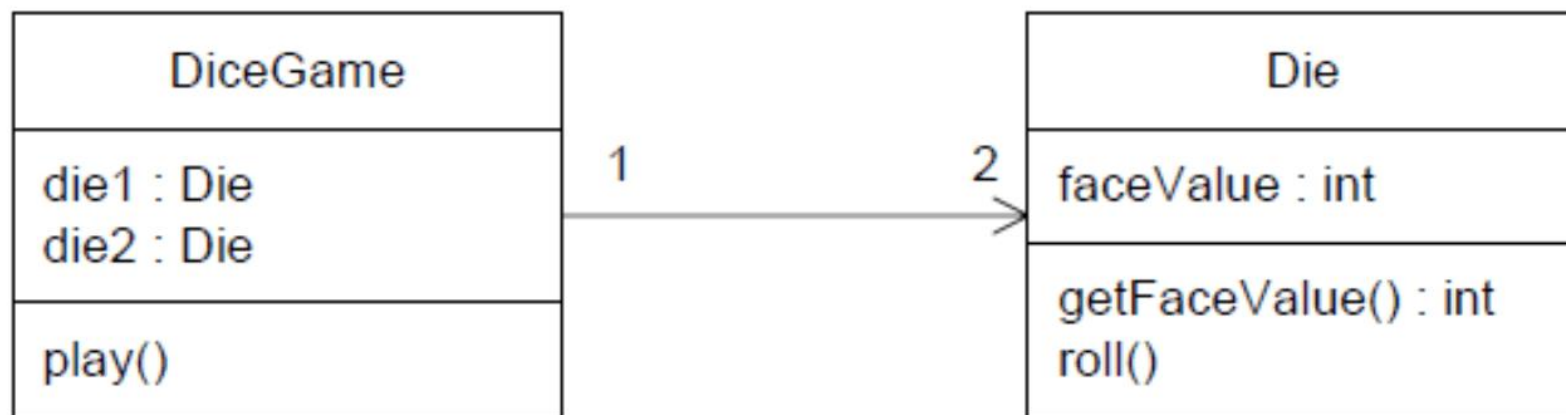
Define Interaction Diagrams

Interaction diagram illustrating messages between software objects.

Define Design Class Diagrams

Partial design class diagram

References

Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development