

SOFTWARE ENGINEERING
WITH OBJECTS AND COMPONENTS

PERDITA STEVENS

WITH ROB POOLEY

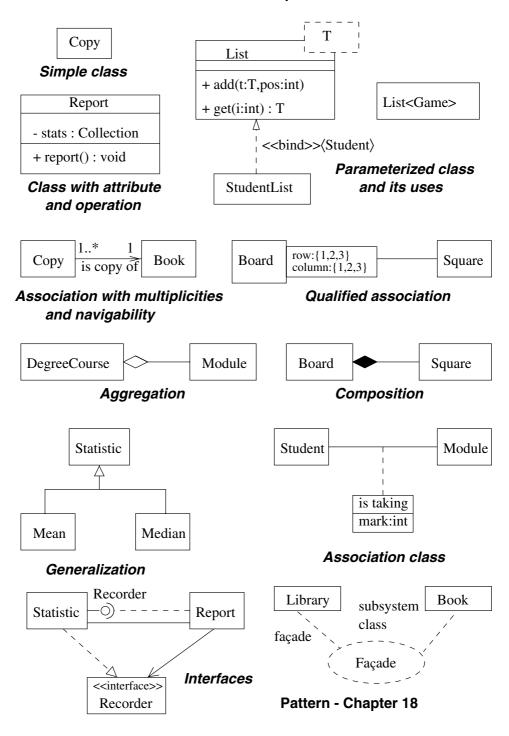
SECOND EDITION





Additional student support at www.pearson.co.uk/stevens

Classes: Chapters 5 and 6



Using UML

Table of Contents

\sim	\sim	١	,	_	r
ι.	. ()	•	,	$\boldsymbol{\mu}$	ı

Using UML 2nd edition

Contents

Preface

First edition acknowledgments

List of Figures

part I Conceptualbackground

Software engineering with components

What is a good system?

Do we have good systems?

What are good systems like?

How are good systems built?

Object concepts

What is an object?

How does this relate to the aims of the previous chapter?

Inheritance

Polymorphism and dynamic binding

Introductory case study

The problem

Scope and iterations

Identifying classes

Relations between classes

The system in action

Design by Contract 1



Persistence

The development process

Defining terms

The development process

System, design, model, diagram

part II The Unified Modeling Language

Essentials of classmodels

Identifying objects and classes

Associations

Attributes and operations

Generalization

Design by Contract 2 Substitutivity

The class model during the development

CRC cards

More on classmodels

More about associations

OCL, the Object Constraint Language

More about classes

Stereotypes

Properties and Tagged Values

Parameterized classes

Dependency

Components and packages

Visibility, protection

Essentials of usecase models

Actors in detail

Use cases in detail

System boundary

Using use cases



Possible problems with use cases

Use Case Driven Development?

More on usecase models

Relationships between use cases

Generalizations

Actors and classes

Essentialsof interactiondiagrams

Collaborations

Communication diagrams

Sequence diagrams

Where Should Messages Go? Law of Demeter

More advanced features

Interaction diagrams for other purposes

More oninteractiondiagrams

Beyond simple sequences of messages

Concurrency

Essentials of state and activity diagrams

State diagrams

Designing Classes with State Diagrams

Activity diagrams

More on statediagrams

Other kinds of events

Other kinds of actions

Looking inside states

Concurrency within states

Architectural and implementation diagrams

Component structure diagrams

Deployment model

The Deployment Model in the Project



Packagesand models

Packages

Models

part III Case studies

CS4administration

The case study

Discussion

Board games

Scope and preliminary analysis

Interaction

Back to the framework

States

Discrete eventsimulation

Requirements

Outline class model

Use cases

Standard mechanism for process-based simulation

Associations and navigability

Classes in detail

Class Report

Class Statistic

Building a complete simulation model

The dining philosophers

part IV Towards practice

Reuse:components,patterns

Practicalities of reuse

Design patterns

Frameworks

Product quality:verification, validation, testing



Quality review

How can high quality be achieved?

Verification

Validation

Testing

Reviews and inspections

Process quality:management,teams, QA

Management

Teams

Leadership

Quality assurance

Quality Assurance: The Case Against

Further reading

Bibliography

Index