Class Exercise, Assignment Review

CSCI 4448/5448: Object-Oriented Analysis & Design

Lecture 23A — 03/22/2019

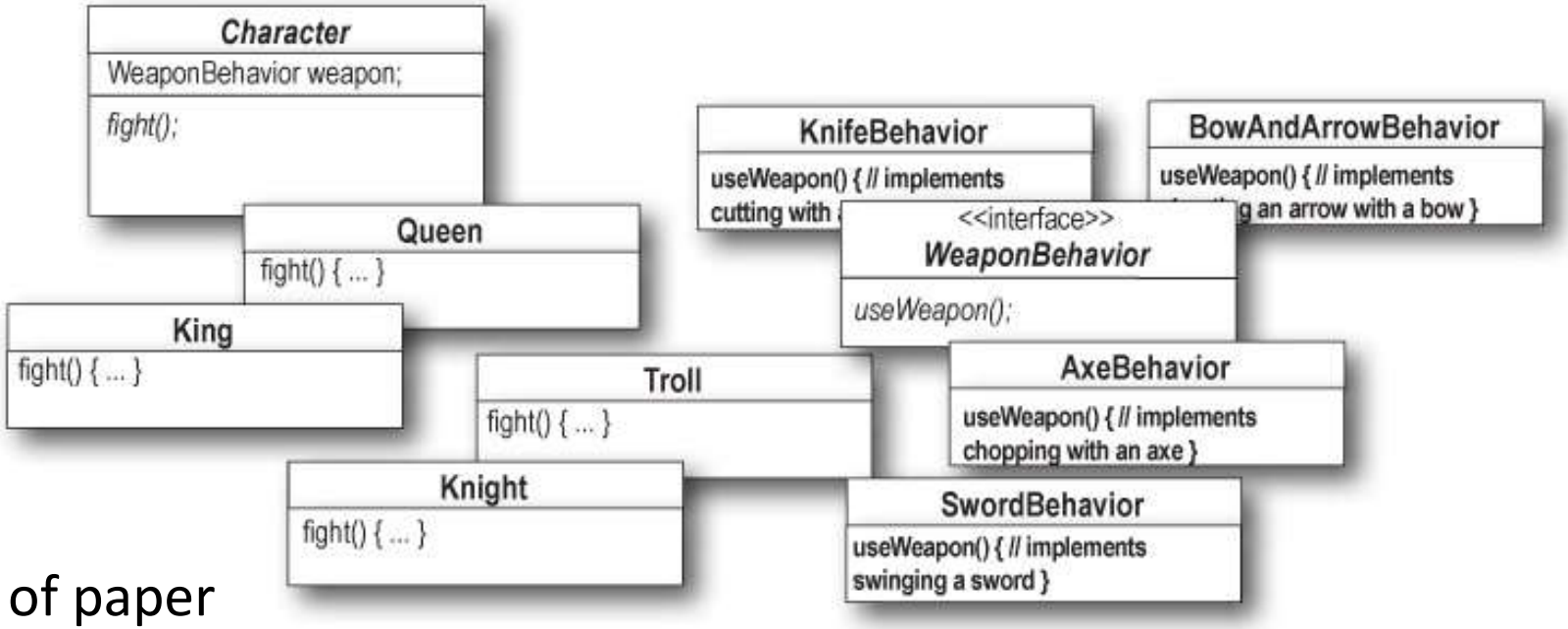
Goals of the Lecture

- A class exercise for extra credit Quiz points!
- Review the remaining homework and project submissions
- Get to Spring Break!

Class Exercises

- Close ALL computers, notes, etc., put your phones away
- Teams – keep each other honest – brains ONLY
- Two to Five People Per Team…
  - Participation is optional, but no extra credit will be awarded if you pass
- Rearrange yourselves as needed…
- Let me know when you're ready…

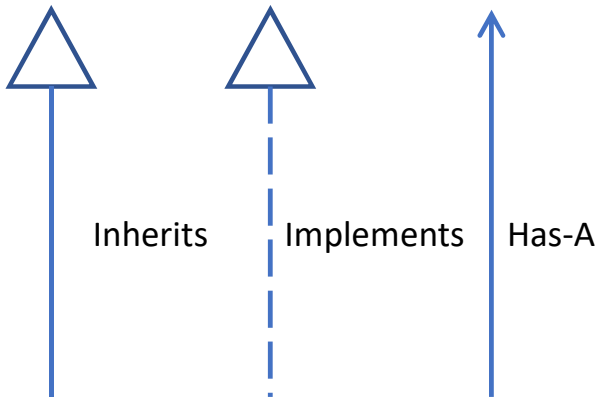
Part One: Pattern Practice - Strategy



On a blank sheet of paper

1. Put your team's full names (for grades)
2. Arrange the classes for Strategy Pattern
3. Draw the right arrows between classes
4. Put the method setWeapon in the right class
5. Go!

```
setWeapon(WeaponBehavior w) {
    this.weapon = w;
}
```



Pattern Practice - Strategy

- Hand your diagram to another team and take theirs
- Grade the diagram you're looking at against this version
  - Perfect match = 3 points
  - Almost perfect match = 2 points
  - Looks sort of like a class diagram = 1 point
- Hand them back to the original team

Pattern Practice - Strategy

- Grade the diagram you're looking at against this version
  - Perfect match = 3 points
  - Almost perfect match = 2 points
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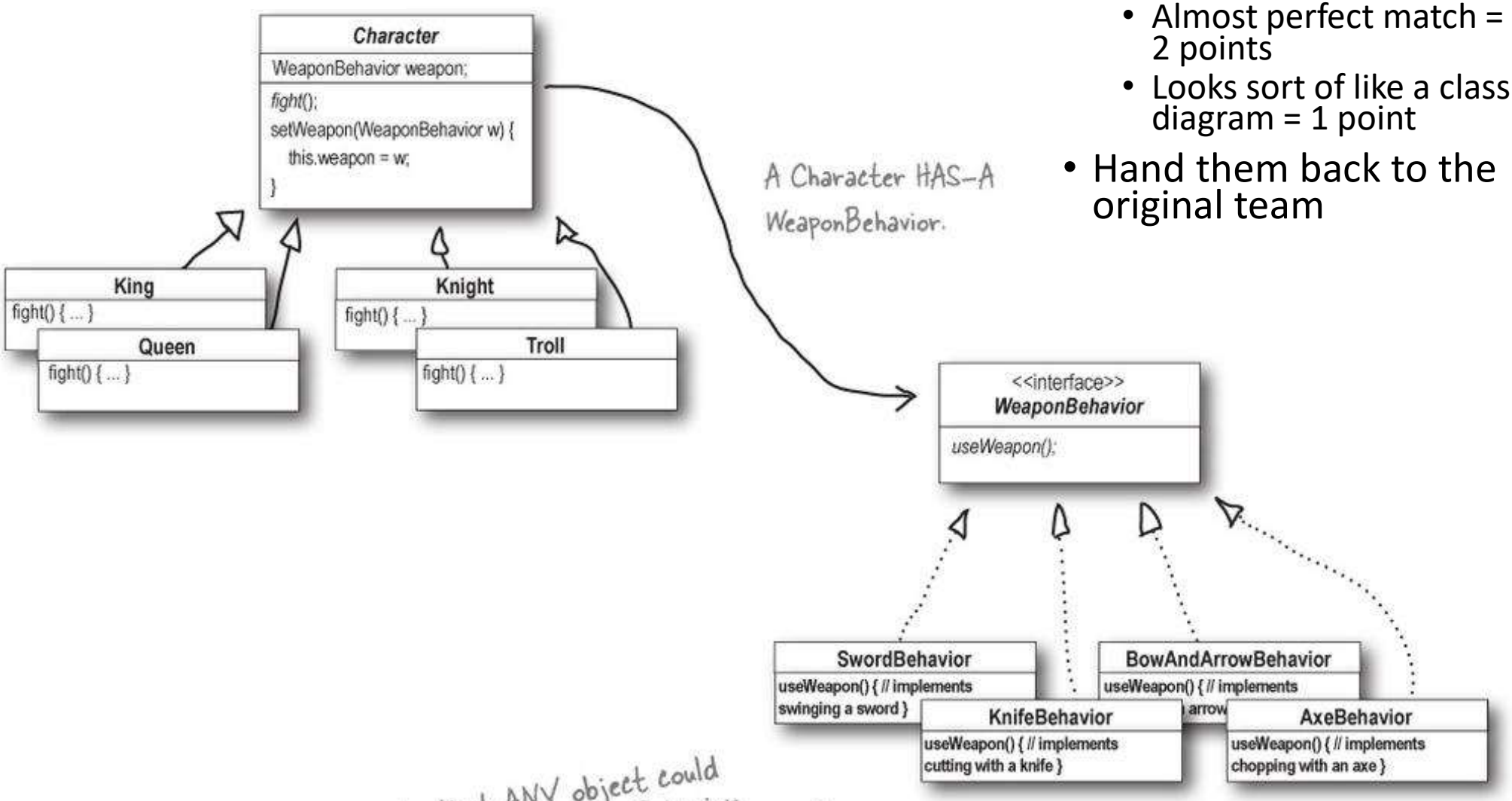

Part Two

- Close ALL computers, notes, etc., put your phones away
- No references for this but your brains!
- Same team
- On the back of that diagram or on a new sheet
  - If you use a new sheet, put the names on it
- Ready?

Part Two – OO Principles – fill in the blanks

1. Encapsulate what _____
2. Favor composition (delegation) over _____
3. Program to _____ not implementations
4. Strive for _____ _____ designs between objects that interact
5. Classes should be open for extension, but closed for _____
6. Depend on _____ , not concrete classes
7. Only talk to your (immediate) _____
8. Don't _____ us, we'll _____ you
9. A class should have only one reason to _____
10. Classes are about _____ , not specialization
11. DRY = _____
12. YAGNI = _____

Part Two – OO Principles

- Hand your sheets to another team for grading
- Grading
  - ALL PERFECT! – 3 Points
  - ALL(most) PERFECT – missed 1 or 2: 2 points
  - NOT QUITE PERFECT… - missed more then 2: 1 point

Part Two – OO Principles

1. Encapsulate what matters
2. Favor composition (delegation) over decomposition
3. Program to impress, not implementations
4. Strive for extremely cool designs between objects that interact
5. Classes should be open for extension, but closed for holidays
6. Depend on cash, not concrete classes
7. Only talk to your (immediate) family
8. Don’t annoy us, we’ll annoy you
9. A class should have only one reason to run away
10. Classes are about survival, not specialization
11. DRY = Opposite of Wet
12. YAGNI = You Are Getting Nowhere Immediately

Part Two – OO Principles

Grading
ALL PERFECT! – 3 Points
ALL(most) PERFECT – missed 1 or 2: 2 points
NOT QUITE PERFECT… - missed more then 2: 1 point

1. Encapsulate what **varies**
2. Favor composition (delegation) over **inheritance**
3. Program to **interfaces** not implementations
4. Strive for **loosely coupled** designs between objects that interact
5. Classes should be open for extension, but closed for **modification**
6. Depend on **abstractions**, not concrete classes
7. Only talk to your (immediate) **friends**
8. Don't **call** us, we'll **call** you
9. A class should have only one reason to **change**
10. Classes are about **behavior**, not specialization
11. DRY: **Don't repeat yourself**
12. YAGNI: **You Aren't Going to Need It** or **You Ain't Gonna Need It**

End of class exercise

- All class participants receive 3 QUIZ POINTS extra credit
- I will be posting an extra credit exercise for the remote folks soon, I will try my best to make the point availability equivalent to in class…
- I will post the lecture immediately after class

Homework 5 – Interim Project Report

Submit a PDF containing:

- **The names of all team members and the title of the project!**
- **Summary (25 points)**
  - Written description of the work done in the first two weeks of your project and (in the case of multi-person teams) the breakdown of work across team members.
  - Provide an estimate of how much more work needs to be done for you to have implemented the design that you presented in Homework 4 (or describe how your design is changing as a result of making progress in implementing your system).
  - If you have actual screenshots of your system in action, please include them. If you have developed test cases for your system, please describe them.
  - In addition, now that you have more of your system implemented please describe if you have been able to incorporate the use of design patterns into your prototype. If so, describe the patterns you have incorporated into your design and how they are helping you or your design.
- **Class Diagram (20 points)**
  - A class diagram that shows the classes that have been implemented so far and their relationships to one another. (In other words, this diagram may **not** show the complete system you designed in Homework 5 but rather the classes actually implemented during the past two weeks.)
- **Plans for next two week iteration (5 points)**
  - What are your plans for the final iteration. What do you plan to have done by April 26 when the project is due?
- **Homework 5 is due 4/12 11 AM – not accepted after one week late period**

Homework 6 – Final Project Submission

There are three required deliverables:

- **Final Report (50 Points) – PDF**
  - Name of project and all team members
  - Document the final state of your system: what features were implemented
  - Class diagram showing the final set of classes and relationships of the system
  - The report must discuss how the final system changed from the design you presented in homework 4.
    - In particular, include the class diagram you submitted for homework 4 and use it to compare and contrast with the class diagram that represents the final state of the system.
  - Did you make use of any design patterns in the implementation of your final prototype? If so, how?
  - What have you learned about the process of analysis and design now that you have stepped through the process to create, design and implement an OO system?
- **Code Submission (50 Points) – GitHub Repository URL**
  - Code should be well structured and documented with appropriate comments. Uses of OO Patterns or other design principles should be noted. No work should be done on the project after it is submitted.
- **Demonstration (50 Points) – In person demonstration of the system to Manjunath or Dr. Montgomery – approx. 15 minutes**
  - Demonstration plans/signups will be finalized at the beginning of April.
  - Remote students with no team members on campus should contact Dr. Montgomery for other arrangements.
- **Grading:** This assignment is worth 150 Homework points
- **Due Date: PDF and URL must be submitted before 4/26 at 11 AM – late work will not be accepted!**

Quiz 7: Lecture 23 - OO Principles

- Encapsulate what varies
- Favor composition (delegation) over inheritance
- Program to interfaces not implementations
- Strive for loosely coupled designs between objects that interact
- Classes should be open for extension, but closed for modification (Open-Closed Principle)
- Depend on abstractions, not concrete classes (Dependency Inversion Principle)
- Only talk to your (immediate) friends (Law of Demeter, Principle of Least Knowledge)
- Don’t call us, we’ll call you (the Hollywood Principle)
- A class should have only one reason to change
- Classes are about behavior, not specialization
- Don’t repeat yourself (DRY Principle)
- Single Responsibility Principle (SRP)
- Liskov Substitution Principle (LSP)
- You Aren’t Going to Need It (YAGNI Principle)

Quiz 7: Lecture 23 - OO Principles Quick Paper!

- Due Wed 4/3 11 AM
- One page PDF – individual work please, no shared work – 10 points
- Your Name
- Title: Select one of the OO principles
- Paragraph 1 – Describe the principle, what does it mean? Include any patterns or code/design issues that are related. Are there other principles related to this one?
- Paragraph 2 – What is the importance of the principle, what would you expect to be better in code or designs for using it, or worse if you don't?
- Paragraph 3 – In your coding experience, have you seen examples of the principle at work (or where it was needed)? If so, describe your encounter with it. If not, describe a possible situation when it may come up.
- Citations are not required, but you should use them is you are referencing or citing any prior published materials. Any format is fine.

Graduate Presentation Project

Project Content (100 points):

1) Graduate Presentation (50 Points) – PDF + Optional Media Files

A submitted set of slides, a recorded presentation, or a combination. Should be at least 30 minutes worth of material if the full presentation was given. The overall quality and thoroughness of the project will count for 40 points. Content for a two person team should evidence additional effort and detail. Appendices or supporting slides that include information not directly used in the presentation may be included.

The submission must include citations supporting any claims made – any format is fine but citations should provide a path to find any referenced published literature: paper, book, web site, etc. Citations should be referenced in the above submission on the slide where used and summarized in slides at the end of the presentation. I expect at least ten solid supporting citations for these projects, if not more. At least five references must come from publications, not web sources. Citations will count for 10 points.

2) Example Code and README (40 points) GitHub URL

A runnable example program used to illustrate presentation points should be provided via GitHub, along with a README markdown file with team members, program description, and notes on execution and use. The program provided will count for 30 points, the README for another 10 points. [Note, if code is not applicable to your investigation, contact me regarding alternate graded submissions.]

3) Summary Presentation (10 Points) – PDF + Optional Media Files

A summary presentation will be provided to the class in a ten minute slot during the last few classes – those attending the class will present this in person. For distance graduate students, there is an option to provide a summarized recorded 10 minute presentation or to submit a similar length slide set. The summary presentation can use slides from the main project, and may include new ones as well. This summary presentation and participation is required, and will be worth 10 points.

Three deliverables will be turned in: The 30 minute full slide set or presentation with citations (a PDF and an optional media file), the GitHub URL for code and documentation, and the 10 minute summary slide set or presentation (a PDF with optional media file).

We'll begin scheduling the presentations in early April.

Graduate Presentation submission (all three items) due on or before 4/15 at 11 AM

May NOT be turned in late

Next Steps

- 3/25 to 3/29 – Spring Break – **enjoy!**
  - I will be in Mexico on business that week, please excuse any response delays
- Coming up
  - Monday 4/1 – More Design Techniques (Chapters 15, 16, 17 from textbook)
  - Wednesday 4/3 – Recitation with Manjunath (optional)
  - Friday 4/5 – More Design Patterns (Ch 18, 19)
- Things that are due
  - Homework 4 – Design for Semester Project – is due today
  - Quiz 7 PDF Paper is due Wed 4/3 11 AM
    - Probably 3 more quizzes in semester, we'll see…
  - Homework 5 – Interim Report – 4/12 at 11 AM (50 points)
  - Graduate Presentation – 4/15 11 AM
    - Sign ups for presentation slots will start 4/1
  - Homework 6 – Final Project – 4/26 at 11 AM (150 points)
    - We'll talk more about how we'll do demonstrations after the break
- Late Notices
  - **Homework 4 and 5 will NOT be accepted after the 1 week late period**
  - **Final Homework 6 submission on 4/26 at 11 AM may NOT be turned in late**
  - **Graduate Presentation submission on 4/15 at 11 AM may NOT be turned in late**