CS 102
Object Oriented Programming

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About the Instructor

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Computer Science

- The science of solving real world problems by processing data and developing automated tools with the help of computers.

Source: "Core: Defining Classes and Creating Objects" Lecture Notes from UCSD Course on OOP in Java

Computer Science

- The science of solving **real world problems** by processing data and developing automated tools with the help of computers.

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A real world problem

- Which movies should Netflix recommend to me?

A real world problem

- Which movies should Netflix recommend to me?
- Ok yes, it is a first world problem ☺, but still it is a problem to be solved.

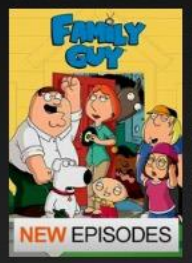
A real world problem

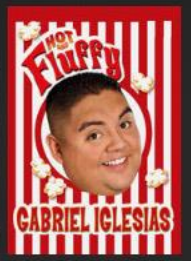
- **Which movies should Netflix recommend to me?**
- To solve this problem, we need to process some data like …

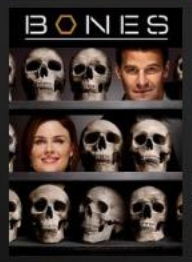
NETFLIX

Popular on Netflix

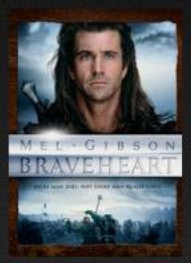




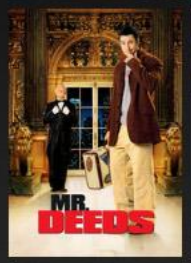


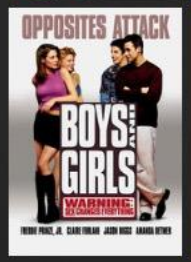


Dark Movies



Romantic Opposites-Attract...

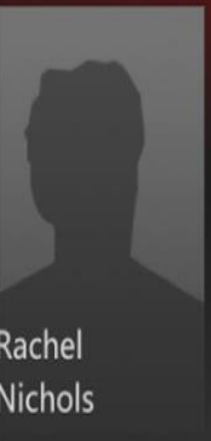


A NETFLIX ORIGINAL SERIES

nic_

&12 a b c d e f g h i j k l m n o p q r s t u v w x y z ␣ ⌫

Movies & TV People Nicolas Cage



Season of the Witch ★★★☆☆ 2011 PG-13 1h 34m HD 5.1

A group of weary warriors transport a suspected witch believed to be responsible for spreading the devastating Black Plague.

Nicolas Cage, Ron Perlman, Stephen Campbell Moore

A Play B Back X Add to instant Queue

Steven Spielberg

One of the most successful filmmakers in history, Steven Spielberg was born Dec. 18, 1946, in Cincinnati. He made 8mm home movies during his youth and spent many years directing for television after dropping out of college.

His 1971 television movie Duel hinted at the suspense level of later films such as Jaws (1975), but Close Encounters of the Third Kind (1977) earned him his first Oscar nomination for directing. Although films such as the Indiana Jones trilogy and E.T.: The Extra-Terrestrial (1982) were hits with audiences, it wasn't until The Color Purple (1985) that he tackled more serious subjects.

In 1993, Spielberg directed the Holocaust drama Schindler's List, for which he won his first Oscar for Best Director; he won again for Saving Private Ryan (1998). Spielberg also has tackled more traditional fare such as Catch Me If You Can (2002) and The Terminal (2004). His broad resume and depth of talent garnered him the Cecil B. DeMille Award in 2009.

Highest Rated For You

Add

Schindler's List

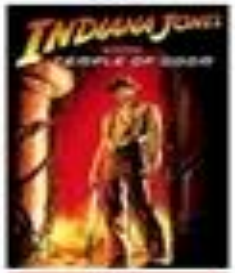
Liam Neeson stars as Oskar Schindler, a greedy German factory owner made rich by exploiting cheap Jewish labor. But as World War II unfolds, he becomes an unlikely humanitarian, spending his entire fortune to help save 1,100 Jews from Auschwitz.

1993 R 193 minutes

Raiders of the Lost Ark

Add

Indiana Jones and the Temple of Doom



Add

Hook

Add

The Adventures of Tintin

Play Add

Lincoln

Add

Indiana Jones and the Last Crusade

Add

Empire of the Sun

Catch Me If You Can

The Blues Brothers

E.T.: Original 1982 Version

Pinky and the Brain

The Color Purple

NETFLIX

Top 10 for Eddy

Who's watching?

Edit Profile

Eddy

Jess

Timmy

Add Profile

Popular on Netflix

A real world problem

- **Which movies should Netflix recommend to me?**
- To solve this problem, we need to process some data like **movies, series, actors, users** etc.

A real world problem

- **Which movies should Netflix recommend to me?**
- To solve this problem, we need to process some data like movies, series, actors, users etc.
- **How much data then?**

A real world problem

- Some statistics about Netflix
  - 75 Million subscribers (Jan. 2016)
  - Users spend 10 Billion hours watching Netflix per month (Dec. 2015)
  - Pushed approximately 329,400,000,000 GB of data in 2015 (Dec. 2015)

Source:http://expandedramblings.com/index.php/netflix_statistics-facts

A real world problem

- Some statistics about Netflix
  - 75 Million subscribers (Jan. 2016)
  - Users spend 10 Billion hours watching Netflix per month (Dec. 2015)
  - Pushed approximately 329,400,000,000 GB of data in 2015 (Dec. 2015)

- Today, we create and therefore have to deal with large amounts of data.

Source:http://expandedramblings.com/index.php/netflix_statistics-facts

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- The science of solving **real world problems** by processing data and developing automated tools with the help of computers.

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Computer Science

- The science of solving **real world problems** by processing **large amounts of data** and developing automated tools with the help of computers.
- Solving problems require us to organize this data in a way that is easy to maintain in our proposed solutions (programs)

Source: "Core: Defining Classes and Creating Objects" Lecture Notes from UCSD Course on OOP in Java

Computer Science

- How are we going to maintain this information in our programs?

Computer Science

- How are we going to maintain this information in our programs?
- Our proposed programs need to **match to the problem** we are trying to solve
  - In the problem, what are the real world objects?
    - what kind of information do they hold?
    - what kind of functionalities they have?

Source: "Core: Defining Classes and Creating Objects" Lecture Notes from UCSD Course on OOP in Java

Computer Science

- How are we going to maintain this information in our programs?
- Our proposed programs need to match to the problem we are trying to solve
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    - what kind of information do they hold? (attributes)
    - what kind of functionalities they have? (behavior)

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Computer Science

- Our proposed programs need to match to the problem we are trying to solve
  - In the problem, what are the real world objects?
    - what kind of information do they hold? (attributes)
    - what kind of functionalities they have? (behavior)
  - Solve the problem in terms of these objects
    - Objects in the real world ~ Objects in our programs
    - Low representational gap
  - **The object oriented programming**

Source: "Core: Defining Classes and Creating Objects" Lecture Notes from UCSD Course on OOP in Java

Netflix Example

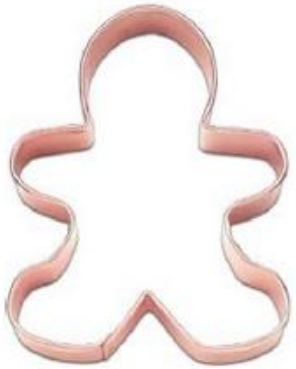
- Can you think of any real world objects for the Netflix problem?
- What about their attributes and behaviors?

Classes & Objects

- A **class** is a type of data
  - Class provides a description (template) of how to hold the data and what to do with it
- An **object** is an instance of class

Classes & Objects

- Instantiation is analogous to making cookies from a cookie cutter.
  - The cookie cutter is the class which specifies the shape of each cookie
  - Cookies are objects, the values of their fields (e.g. color of buttons) may be different. Each object has its own identity, but they are created from the same specification.



Topics to be Covered

- Classes and objects
- Objects and memory
- Class hierarchy and inheritance
- Abstract classes and interfaces
- Visibility of class members
- GUI programming, listeners
- Static members and methods
- Inner classes
- Exception handling
- Files, streams, and serialization
- Concurrency
- Networking

Learning Outcomes

- Implement the necessary interface of an object and concretization of an abstract object.
- Utilize static and non-static methods.
- Utilize fundamental collection objects.
- Implement programs that use polymorphism.
- Implement an object oriented solution to a problem.
- Implement programs that are catching exceptions.

Outline for Today

- Introduction
- Course Organization
  - Schedule
  - TAs
  - Grading & Other course policies
- First part of the course
  - Hello World without the ACM library

Course Organization

Weekly Schedule

- Lectures
  - Monday: 8:40-10:30 (EF AB1 #510)
  - Tuesday: 8:40-10:30 (EF AB1 #511)
- **Most likely** Tuesday lectures will be used for labs
  - Cover additional lectures & course related materials
  - Do practices
  - Quizzes
  - Midterm Exams
- Lecture slides will be uploaded to LMS

Teaching Assistants

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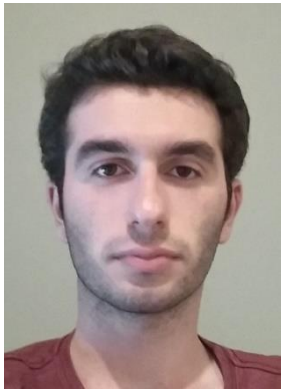

Office Hours

- In case you need help other than office hours:
  - Please post it to Piazza
    - You will be receiving the invitations soon.
    - Please ask your general questions there.
    - Do not post any part of your assignment there.
  - If you cannot solve it through Piazza, request an appointment by email
    - Indicate 2-3 available time slots
- Please do not contact with your TAs at arbitrary hours in their offices

Grading

10%	Assignments
10%	Project
10%	Quizzes
70%	3 Exams

- Any one of the followings result in a failing grade
  - Not delivering more than 2 assignments
  - Missing a midterm exam or final
  - Overall grade average below 45
  - 3 exams average below 30

Grading

10%	Assignments
10%	Project
10%	Quizzes
70%	3 Exams

- Grades will be announced through LMS, but the default percentages at LMS won't be updated.
- Apply these percentages to calculate your final grade.
- Unless announced otherwise, the distribution of assignments and quizzes will be same.

Exams

20%	Midterm 1
20%	Midterm 2
30%	Final
70%	**Total**

- **If your total is less than 30, you will fail!**
- **If you miss one exam, you will fail!**

Exams: Example Cases (Exam scores are over 100)

- Student 1:
  - Midterm 1: 50
  - Midterm 2: 20
  - Final: 60
  - Total:
    - 50 x 20/100 +
      20 x 20/100 +
      60 x 30/100 = **32**
  - **Pass from the exam criteria, will check the other criteria**
- Student 2:
  - Midterm 1: 40
  - Midterm 2: 40
  - Final: 40
  - Total:
    - 40 x 20/100 +
      40 x 20/100 +
      40 x 30/100 = **28**
  - **Fail from the exam criteria, therefore fail the course**

Make-Up Exams

- Don't take make-up exams unless you have a very convincing reason
  - If you get sick you better be really sick.
- Make-up exam will be done at the end of the semester only for students who can pass with or without a make-up exam.
  - If you need to get 101 from the make-up in order to pass the course, you won't take the make-up.
- You can only take one make-up exam.
  - If you miss one, you cannot miss another

Grading

10%	Assignments
10%	Project
10%	Quizzes
30%	Total

- If you pass the exam criteria, you still have to
  - collect at least 15 points total from assignments, project and quizzes
  - submit N-2 assignments (N: # assignments)

Quizzes

- We will have a quiz at every lab.
- Around 11-12 quizzes are expected.
- The total grade of the quizzes will be 10%.

Project

- The same project will be expected from all of you.
- Probably individual projects, not in groups.
- The details will be announced later.
- It will affect 10% of your total grade.

Programming Assignments

- Programming language: Java (without ACM library)
  - Standard Development Kit (SDK)
- Development environment:

- Assignments will be accepted via LMS
  - http://lms.ozyegin.edu.tr

Programming Assignments

- Each homework will have strict guidelines for input / output / submission
  - Any homework which does NOT obey these guidelines will be given a 0 (zero/sıfır/null) grade
- Late assignments will not be accepted
- No exception to these rules

Programming Assignments

- We expect that you adhere by basic academic ethics guidelines while working on your homeworks and project.
  - You can study with your friends, but the implementation must be performed individually.
  - You should not look at the code of somebody else
- Zero tolerance policy
- In case of plagiarism
  - You will receive -100 as a grade
  - You will be sent to the University Disciplinary Council

Programming Assignments

- The main objective of programming assignments and projects is for you to **LEARN**.
- Submitting a fully finished assignment or project does not necessarily mean that you will get full grade.
- You can be asked for a demo (during labs or office hours) where you explain your code or make some small changes in your code.
  - If you cannot show your work in these demo sessions which means that you did not learn, then your grade can be decreased.

DOs & DON'Ts for assignments

- How should we deal with homeworks?
  - Read and understand every detail and requirement.
  - Use your time carefully-Do not leave it to the last day.
  - Make sure you understand your solution before you start coding it– otherwise you will have big problems.
  - Use office hours to discuss it with your professor & assistants
  - **Don't cheat**

Any Questions ?

Sources of Used Netflix Images

- Slide 6 (Netflix Recommendations):
  - https://analytics.club/wp-content/uploads/2015/09/netflix-recommendations.jpg
- Slide 9 (Netflix Movies):
  - http://blogs.indiewire.com/shadowandact/netflix-explains-why-it-doesnt-always-have-that-film-or-tv-show-you-really-want-to-see-video
- Slide 10 (Netflix Series):
  - http://compauta.com.br/vai-de-rodizio-ou-a-la-carte/
- Slide 11 (Netflix People Search):
  - http://technabob.com/blog/2012/08/26/netflix-people-search-xbox-360/
- Slide 12 (Netflix Director):
  - http://dvd-rental-review.toptenreviews.com/netflix-review.html
- Slide 13 (Netflix Users):
  - http://www.latintimes.com/netflix-launches-user-profiles-how-many-netflix-profiles-can-you-have-one-account-129910