Data Analysis for Game Development

Administrative

IMGD 2905

Outline

- Background
- Admin Stuff
- Motivation
- Objectives

Professor Background (Who am I?)

- Mark Claypool (professor, "Mark")
  - Professor, Computer Science
  - Director, Interactive Media and Game Development
- Research interests
  - Multimedia performance
  - Congestion control (protocols, AQM)
  - Wireless networking
  - Network games
- Currently playing

Student Background (Who are you?) 1 of 2

1. Year?
2. Major?
   a. IMGD Art or Tech
   b. Other
3. Background?
   a. Statistics
   b. Probability

GA

4. **Tools?**
   a. Python
   b. Excel

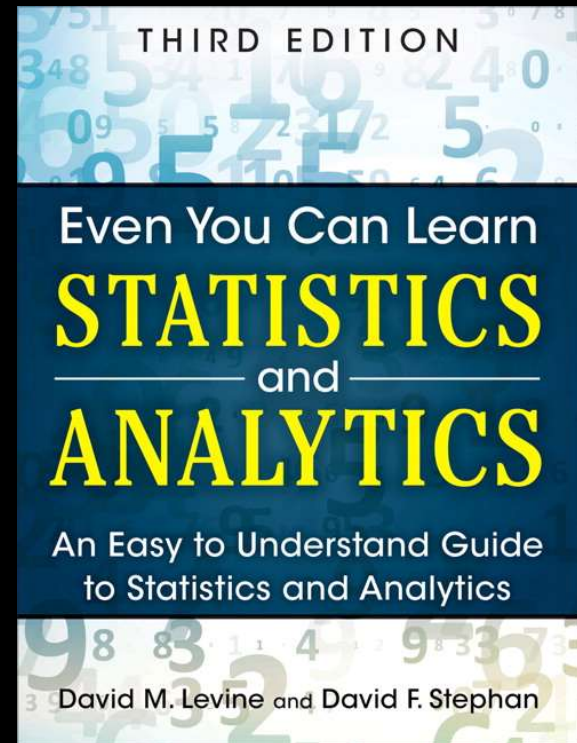5. **Platform of Choice?**
   a. Windows
   b. Linux
   c. Mac

Online Classes

- Meet during regular time slot
  - Zoom
- Ask questions, provide updates, …
- Lectures, but in small chunks
- Group work (Zoom breakout rooms)
- …
- Let's be flexible! We'll see how this goes, what's going well, what is not and adjust!

Syllabus Stuff GA

- www.cs.wpi.edu/~imgd2905/d21
  - Linked from Canvas Web page
- Class: M, T, Th, F   10-10:50am
  - https://wpi.zoom.us/j/542948614
- Office hours (Zoom): TBA
  - Or by appointment
- Email
  - claypool@cs.wpi.edu (me)
- Discord server
  - Invite code on Canvas page

Text Book

THIRD EDITION

Even You Can Learn

STATISTICS
and
ANALYTICS

An Easy to Understand Guide
to Statistics and Analytics

David M. Levine and David F. Stephan

- Unfortunate name, but good content → depth to provide foundation for analytics
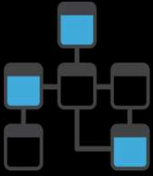- Good examples, but not game-centric

Class Topics

- Data analysis tools and pipeline
- Statistics
- Visualizing and presenting data
- Probability
- Hypothesis testing
- Regression
- Apply topics to game data!
  - Commercial and custom

Course Structure

- Prerequisites
    - College algebra
    - No {programming, stats, probability} expected
    - No game analytics experience required

- Grading
    - Projects (60%)
    - Homework (30%)
    - Participation (10%)
    - On the Canvas Website

Projects

- 4 projects, 60% of grade total
  - Last project slightly larger
- Do analysis on actual game data!
- Use game analytics pipeline
  - Typical flow for game (and other) analytics
  - Common tools used for analytics
- Multiple instances of analysis
  - Apply, become skilled w/methods of synthesis, interpretation, dissemination
- Project 1 – today!

Homework GA

- Written problem set
- From book, Web, made up
- Solve with pencil and paper
- Or calculators
- Or Excel

Participation

- Showing up to class matters
  - Come to class!
- Being engaged in class matters
  - Don't multi-task!
- Ask questions, answer questions
- Playtesting/user studies is 2%
- 10% of your grade
  - But much bigger indirect effect!

Slides

- On the class Web page
- PowerPoint and PDF
- Caution! Don't rely upon slides alone! Use them as supplementary material
  - (come to class)

Timeline

- *Tentative* timeline for dates for exams and projects
  - In order to help you plan

http://www.cs.wpi.edu/~imgd2905/d21/timeline.html

- Will notify if update

Why This Class? (1 of 2)

Goals

- Gain proficiency using modern tools for data acquisition and analysis

- Understand basic probability and statistics as it applies to data analysis

- Develop skills for presenting game data analysis both orally and in written form

Why This Class? GA
(2 of 2)

Objectives

- Use spreadsheet to analyze and visualize game data

- Use scripting language to extract and clean data recorded from game

- Apply summary statistics to game data

- Compute probability distributions for game data

- Write reports with graphs and tables illustrating analysis of game data

- Present game dataset report using appropriate visual aids

Why This Class? − Other

- WPI IMGD requirements
  - Gotta take Math/Quantitative Science
- Statistics and Probability useful for game design and development
- Game Analytics similar to other forms of analytics (e.g., Data Science)
- Fun!
- Game analysis increasingly important (jobs!)

Jobs

Game Play Data Analyst, Sony Interactive Entertainment

Duties

- Advise, define implement gameplay data to ensure understanding of player experience
- Provide insights that impact game design and improve quality
- Create and maintain player segmentation that allows understanding of engagement and spending
- Mine data sets and develop dashboard for live service teams, game developers
- Devise and implement A/B experiments to test acquisition, engagement
- Present finding and provide recommendations

Requirements

- BS/BA degree Stats, Math, Econ, CS or related
- Experience with SQL
- Experience with data visualization packages
- Experience with statistical software
- Experience with Amazon cloud services
- Have created and presented visualizations and insights to various business groups
- Passion for video games preferred

Jobs

Analyst, Riot Games

Duties

- Aggregate and analyze petabytes of game data from various sources
- Prep data for deeper analysis and/or reporting
- Organize collected data into reliable intel that informs Rioters to improve player experience
- Work with decision-makers to understand goals, identify opportunities, and inform decisions across company
- Create awesome

Requirements

- BS/BA degree Stats, Math, Econ, CS or related
  - Graduate degree preferred
- Business savvy
- Technically adept
  - SQL, Python
  - Excel, PowerPoint
- Communicator
  - Reports clear, and concise
  - Presentations to variety of audiences