

CIS 752: Simulation

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- What you should already know?
- What you will learn?
- How you will be graded?

Text Book: Raj Jain, “The Art of Computer Systems Performance Analysis,” Wiley, 1991, 4th+ printing.
Earlier printings have typos.

Grading

- ❑ Class Participation 10%
- ❑ Homeworks 30%
- ❑ Quizes 60%
n out-of n+1 quizzes
- ❑ Grades: A through F

Office Hours

- ❑ Tu-Th 12:30-1:00PM, Dreese 297

Frequently Asked Questions

- ❑ Yes, I do use “curve”. Your grade depends upon the performance of the rest of the class.
- ❑ All homeworks are due at the beginning of the next class (not next week).
- ❑ All late submissions must be preapproved.
- ❑ All quizzes are open-book and extremely time limited.
- ❑ Quizzes consist of numerical as well as multiple-choice (true-false) questions.
- ❑ There is negative grading on incorrect multiple-choice questions. Grade: +1 for correct. $-1/(n-1)$ for incorrect.
- ❑ Everyone including the graduating seniors are graded the same way.

Prerequisite

- ❑ Statistics:
 - Mean, variance
 - Normal distribution
 - Density function, Distribution function
 - Coefficient of variation
Correlation coefficient
 - Median, mode, Quantile
- ❑ C Programming, UNIX

Additional Requisites

- ❑ Common mistakes and how to avoid them
(Chapter 2)
- ❑ Selection of techniques and metrics
(Chapter 3)
- ❑ The art of data presentation
(Chapter 10)
- ❑ Summarizing measured data
(Chapter 12)

Topics

- ❑ Comparing systems using random data
- ❑ Single queue
- ❑ Introduction to simulation
 - Selection of language
- ❑ Analysis of simulation results
 - Validation + Verification
 - Stopping criterion
- ❑ Experimental design
- ❑ Random number generation
- ❑ Testing random number generators
- ❑ Random variate generation
- ❑ Applying techniques taught in the class using CSIM

Tentative Schedule

- 9/25/97 Introduction to the course
- 9/30/97 24. Introduction to Simulation
- 10/2/97 13. Comparing systems using random data
- 10/7/97* 30. Single Queues
- 10/9/97 33. Operational Laws
- 10/14/97 Quiz 1
- 10/16/97 25. Analysis of Simulation Results
- 10/21/97 25. Analysis (Continued)
- 10/23/97 26. Random Number Generation
- 10/28/97 27. Testing Random Numbers
- 10/30/97 Quiz 2

Schedule (Cont.)

- 11/4/97 28. Random Variate Generation
- 11/6/97 29. Commonly Used Distributions
- 11/11/97 Veteran's Day Holiday
- 11/13/97 16+17. Experimental Design
- 11/18/97 19. 2^{k-p} Fractional Factorial Designs
- 11/20/97 Quiz 3
- 11/25/97 Last Class
- 11/27/97 Thanksgiving Holiday

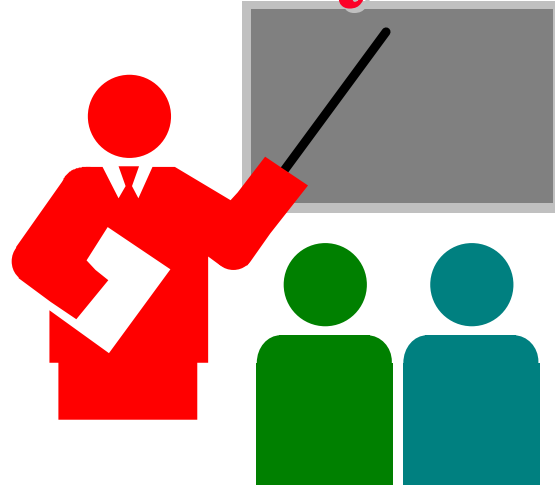
* Class conducted by the assistant

? There may or may not be a class. To be announced.

Why You Shouldn't Take This Course?

- You aren't ready for the hardwork
- You don't have 15 hours/week
- You don't have the background
- You just want to sit and listen
- You are not ready to take the initiative
Only key concepts will be covered in the class.
Students are expected to read the rest from the book.
- This does not cover what you want

Summary



- ❑ It is going to be a time consuming course
- ❑ You will learn a lot
- ❑ Grading: Tough

Quiz 0: Prerequisites

True or False?

T F

- The sum of two normal variates is normal.
- The sum of two normal variates with means 4 and 3 has a mean of 12.
- The probability of a fair coin coming up head once and tail once in two throws is 1.
- The density function $f(x)$ approaches 1 as x approaches ∞ .
- Given two variables, the variable with higher median also has a higher mean.
- The probability of a fair coin coming up heads twice in a row is $1/4$.
- The difference of two normal variates with means 4 and 3 has a mean of $4/3$.
- The cumulative distribution function $F(x)$ approaches 1 as x approaches ∞ .
- High coefficient of variation implies a low variance and vice versa.
- If x is 0, then after $x++$, x will be 1.

Marks = Correct Answers _____ - Incorrect Answers _____ = _____

Homework #1

- ❑ Read chapters 2, 3
- ❑ Submit answers to
 - Exercise 2.2 assuming the system is a personal computer
 - Exercise 3.1
- ❑ Due: Tuesday, September 30, 1997

Homework #2

- ❑ Read Chapters 10 and 12
- ❑ Submit answers to
 - Exercise 10.1
 - Exercise 12.1
- ❑ Due: Thursday, Oct 2, 1997