

# CMSC838M: Advanced Topics in Software Testing

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  - Tu.Th. (3:30PM-6:30PM)
- Don't wait, Don't hesitate, Do Communicate!!

such as web)ls.

# Goals of the Course

- Discuss *advanced* software testing techniques
- Two parts of the course
  - Review testing fundamentals
  - State-of-the-art & emerging techniques
- What do I expect from students?

# MS and Ph.D. Qualifying

- Is the course is valid for PhD qualifying coursework?
  - Yes (Software Engineering/Programming Languages)
- Is the course is valid for MS qualifying coursework?
  - Yes (Software Engineering/Programming Languages)
- Is the course is valid for MS comps?
  - Yes (Both Midterm and Final exams count towards the MS comps.)

# Assessment

- 25% Mid-term Exam
- 25% Final Exam
- 20% Topic Presentation
  - 40 minutes
- 5% Project Presentation
  - 10 minutes
- 25% Term Project
  - chosen by the student and approved. May be a team (2 students) project, depending on the scope of the project)

# Exam Contents

# Student Presentations

- Students must present a paper (perhaps from the list of suggested papers) on one of the listed topics
- 40 minutes
- Contents
  - Problem definition/motivation
  - What are the challenges?
  - Background literature surveyed by the authors
  - Specific technique developed in this paper
  - Weaknesses of the technique

# Student Projects

- Develop a new testing technique to test a particular type of software and experimentally demonstrate that it works (or does not work!!)
- Project Proposal Presentations
- Project Presentations
  
- Possible future research opportunities, publications, and conference talks
- Questions?



# Testing: Our Experiences



Software  
to be tested







# When to Stop?



# When to Stop?



# Sorting Program





# Sorting Program

# Sorting Program

# Sorting Program

# Sorting Program

# Sorting Program

# Sorting Program

# Sorting Program

Sorting  
ProgramSorting



# Sorting Program

# Sorting Program

# Sorting Program

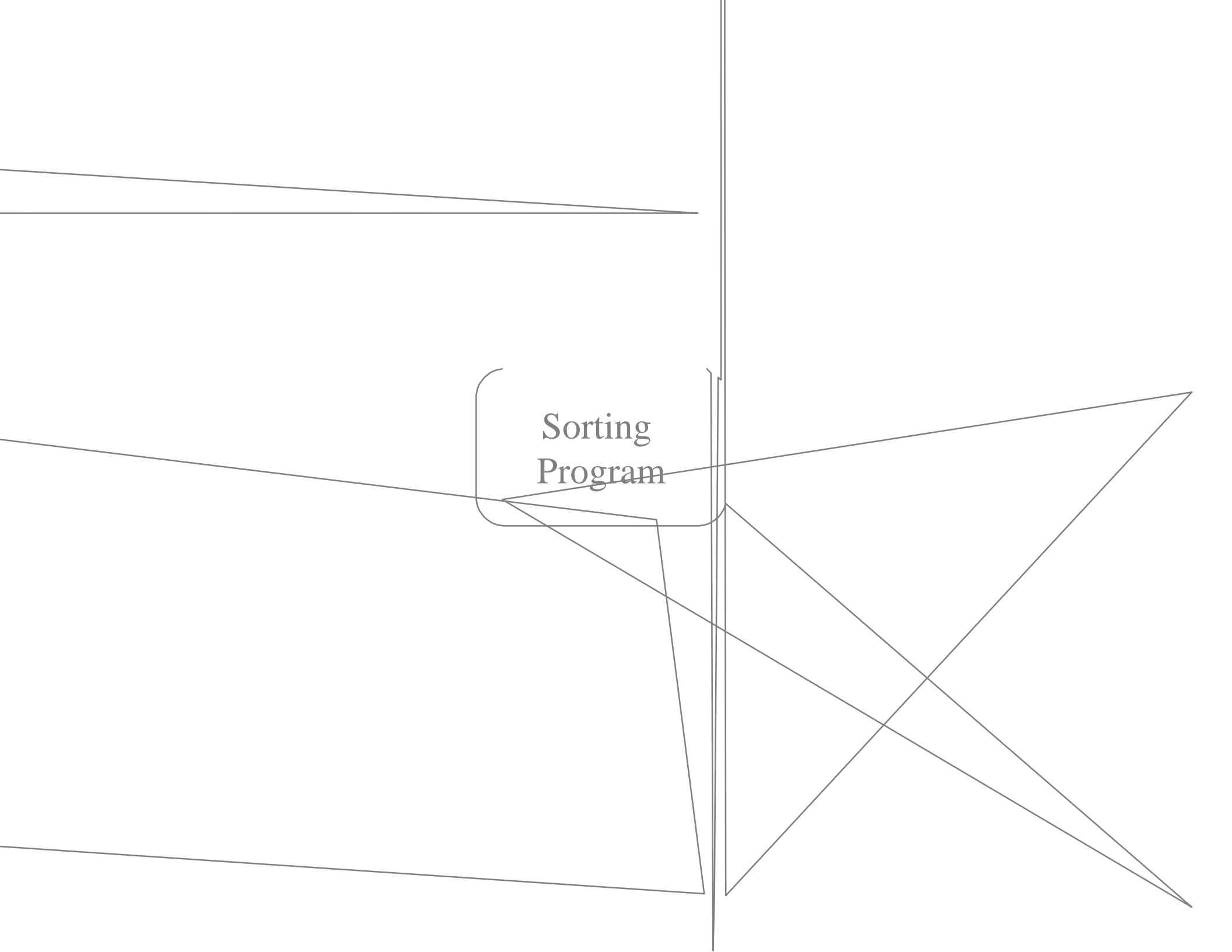
# Sorting Program

# Sorting Program

# Sorting Program



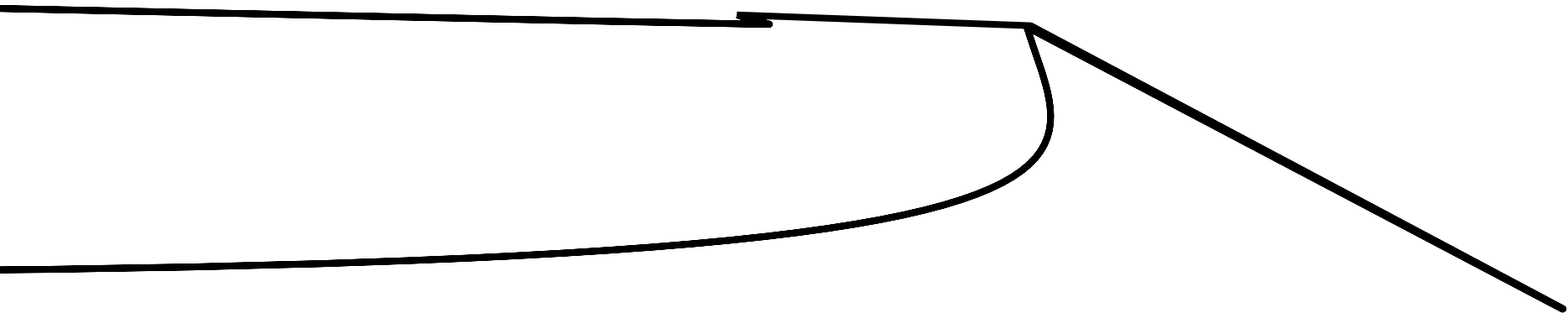
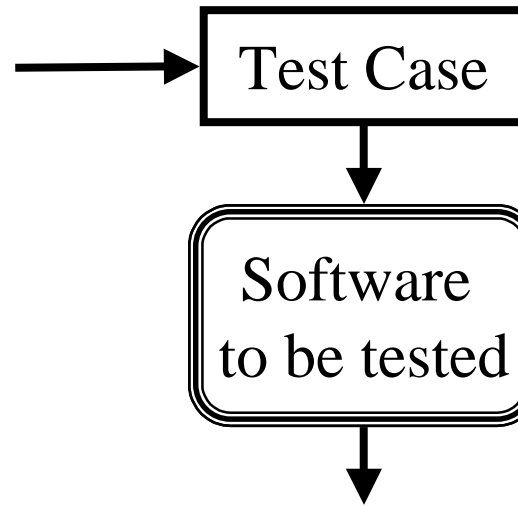
Sorting  
Program







# Automated Testing



# Automated Testing

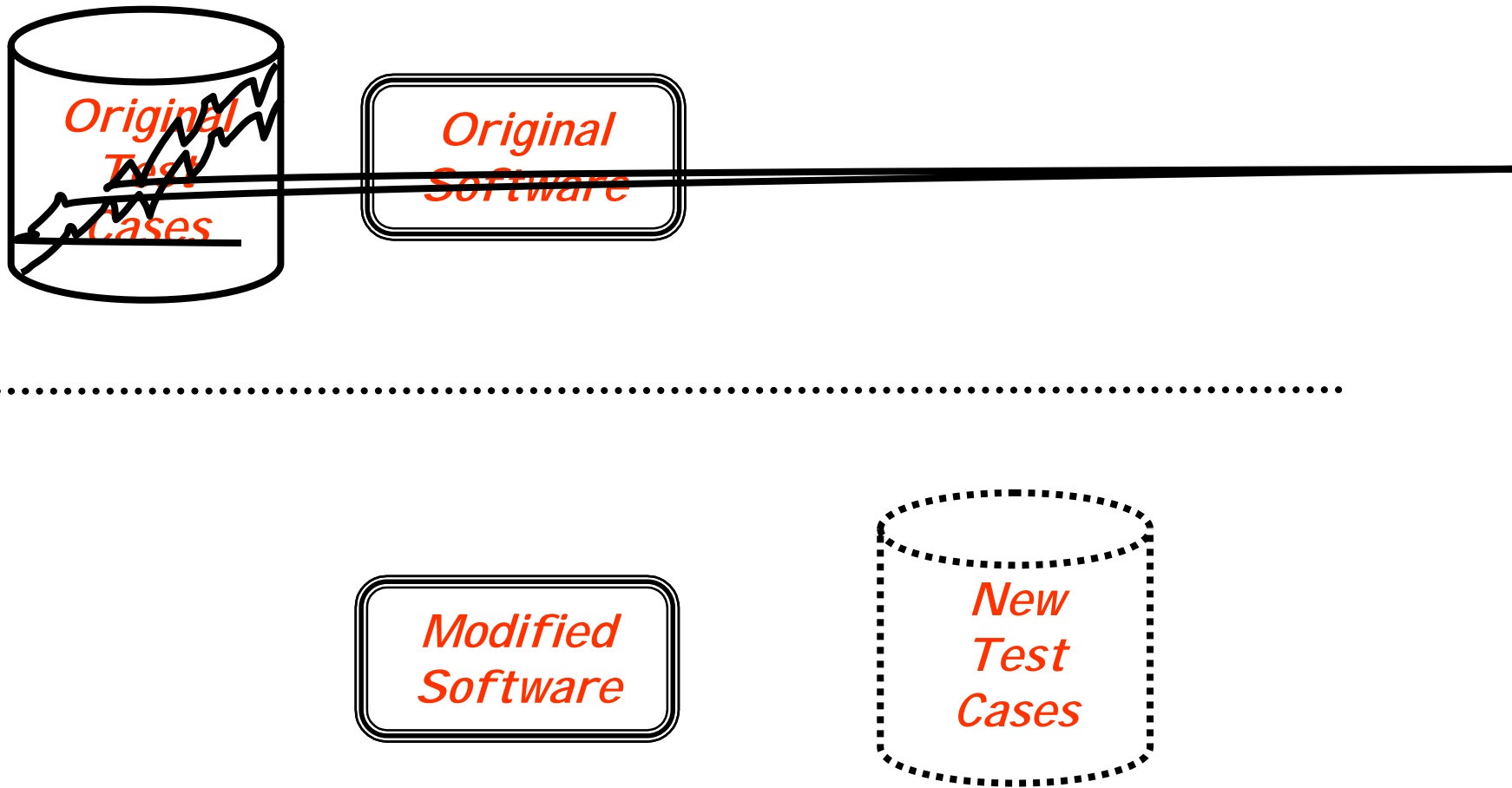
# Automated Testing



# Regression Testing



# Regression Testing



# Different Software

- Object-oriented
- Component-based
- Concurrent
- Distributed
- Graphical-user Interfaces
- Web