

CSE 403 Lecture 9

Risk assessment

Is software different?

- Submit a one sentence answer.

Risk

- Exposure to the chance of injury or loss
- For a software project:
 - Failure to deliver on time
 - Exceeding resource limits
 - Not meeting quality threshold

Abstract view of risk

- Random variable
 - Outcomes with different probabilities



Concrete view of risks

- Professors A, B, C, and D assign grades at random according to known distributions. Give your preference for the Profs (1 highest, 4 lowest)
 - Prof A. $P(4.0) = \frac{3}{4}$, $P(0.0) = \frac{1}{4}$
 - Prof B. $P(3.0) = \frac{1}{2}$, $P(2.0) = \frac{1}{2}$
 - Prof C. $P(4.0) = \frac{1}{4}$, $P(3.0) = \frac{1}{4}$, $P(1.7) = \frac{1}{2}$
 - Prof D. $P(2.4) = 1$

Risk analysis

- Types of Risk
 - Code Development
 - External Dependency
 - Technology
 - Personnel
 - Requirements Change



Sources of Risk I

- Development risks
 - Code harder to develop than thought
 - Learning curve on new facilities
 - Expected facilities not available
 - Need to iterate on requirements / design
 - Performance Issues
 - Trigger other bugs



Sources of Risk II

- Integration risks
 - Parts don't fit together
 - Integration reveals bugs
 - Integration reveals design errors
 - Need to rewrite code after integration
 - Code left out



Sources of Risk III

- Testing risks
 - Bugs will be found
 - Bugs won't be found
 - Complexity of testing matrix
 - Deployment beyond development machines
 - Difficulties in test automation and test tools
 - UI and Workflow feedback



Sources of Risk IV

- Requirements Risks
 - New requirements introduced
 - Change in Specification
 - Inconsistencies in requirements
 - User feedback
 - Market conditions
 - Platform and technology changes



Sources of Risk V

- Deployment Risks
 - Packaging distributable
 - Rights and licensing of components
 - Legal signoff
 - Marketing signoff
 - Systems configuration



Sources of Risk VI

- People risks
 - Unexpected Loss of Personnel
 - Illness
 - Vacation
 - Other demands on time
 - Group friction
 - Inaccurate evaluation of skills
 - Drop in performance

Assess the five categories of risk for Gizmoball

- Code Development
- External Dependency
- Technology
- Personnel
- Requirements Change

Quantification of Risk

- Modeling task completion as a random variable
- Probability density
- Distribution function

Probability distributions on completion time

- Write the data entry module
- Hire a tester
- Fix a simple bug
 - Menu item not checked when operation selected
- Fix a challenging bug
 - Intermittent problem with thread logic

Sketch completion time graphs for the following

- Write a tic-tac-toe program in Java
- Write a tic-tac-toe program in Visual Basic
- Hire a contractor and have the contractor write a tic-tac-toe program in Visual Basic
- Debug some else's tic-tac-toe program

Completion graphs for TIC-TAC-TOE Programming

What type of tasks might have the following DFs ?

Risk Analysis

- Identify top schedule risks to project
- Risk exposure
 - Size of Loss X Probability of Loss
 - (Better might be Expected loss)
 - Guess two numbers and multiply them
 - Value in *attempting* to quantify
- Prioritize based upon exposure

What to do with risk analysis

- Avoid the risk
- Transfer risk off the critical path
- Buy information
 - Bring in outside help
 - Prototype
- Publicize risk
 - The sky is falling
- Schedule to accommodate some risk
- Monitor risks as project progresses

Give a strategy for passing the course from Prof A.

- You need 60 points to pass
- Two midterms and a final
- For each exam
 - $P(0) = \frac{1}{4}$, $P(20) = \frac{1}{2}$, $P(40) = \frac{1}{4}$
- There is an extra credit assignment worth 20 points
- You may drop the class after the first midterm for free
- Dropping the midterm after the second midterm is a W
- You get kicked out of school if you fail a course twice, or withdraw 3 times
- When do you do the EC assignment
- When do you drop the course?