Session 08:
Developing Homework Assignments and Exams

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Outline
What makes a good assignment?
- Homework assignment
- Exam
- Project
- Nifty assignments – discussion
- Meta-cognitive discussion

Resources
Teaching Tips
- Ch.7, Ch.8 (pp.87-94), Ch.9, Ch.15 (pp.192-198, p.204), p.261, p.310
- Tools for Teaching, by Barbara Gross-Davis
  - Ch.28 (http://teaching.berkeley.edu/bgd/quizzes.html), Ch.29 (http://teaching.berkeley.edu/bgd/allay.html)
  - Also Ch.25, Ch.27, Ch.30-31 – not online
- Nifty Assignments (in Computer Science)
  - http://nifty.stanford.edu/
- The Bushwhacking Alternative, by Ed Sobey

What Assignments?
Types:
- Homework assignments
- Problem solving exercises, peer reviews
- In-class activities
- Discussion, role playing
- In-class presentations
- Exams
- In-class or take-home
- Projects

Also...
- Graded or ungraded
- Individual or group

What Makes a Good Homework Assignment?
- List what you believe is the single most important factor in making a good homework assignment.

Potential Factors for a Good Homework Assignment
- Circle the factors that at first you would not have thought of.
  - Clearly relates to the (established) learning goals for the course
  - Directly relates to material discussed in class
  - Is intrinsically motivating and fun to do
  - Challenges students just enough (but not more and not less)
  - Provides clear and measurable goals and expectations
  - Is relatively easy and/or fun to grade and provide feedback for
  - Allows quick self-assessment of progress by each student
  - Encourages and rewards creativity
  - Permits learning to occur at different levels
  - Doesn’t place undue constraints
  - Has a relatively low stakes (risk level)
  - Allows for outcomes other than a complete success or a complete failure
  - Is worded in a way that is inclusive of and respectful toward all students
  - Is proof-read and professionally prepared
  - Identifies a set of milestones that serve to guide students toward the completion of the overall objective
  - Due date/time is respective of student needs
Potentially Controversial Ideas for Homework Assignments

Circle what you believe to be correct.

- Homework assignments benefit from having an element of competition.
  - (A) Yes
  - (B) No

- Homework assignments should attempt to teach “core values” (that the instructor believes in) even if those fall outside the realm of the discipline.
  - (A) Yes
  - (B) No

Potential Factors for a Good Exam

Which of the (same) factors below are not true for exams? Circle.

- Clearly relates to the (established) learning goals for the course
- Directly relates to material discussed in class
- Is intrinsically motivating and fun to do
- Challenges students just enough (but not more and not less)
- Provides clear and measurable goals and expectations
- Is relatively easy and/or fun to grade and provide feedback for
- Allows quick self-assessment of progress by each student
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Recipe for Making a Lousy Exam

- Test mostly memory/recall without relating facts and phenomena to broader concepts.
- Make it too easy or too hard for most students.
  - This way you won’t be able to distinguish below average from average from good achievers.
  - Students won’t be able to tell which group they are in either.
- Don’t match the learning goals for the course.
- Stray far from what assignments have prepared students for (in terms of content and skills).

Aspects Important for Exams but Not for Homework Assignments

Problems must be relatively easy in order to be completed in a limited time.

- Students usually take exams at the same time and in the same place
  - Biases results in favor of those who operate well at those hours/days/locations
  - Students must generally work on their own and quietly (on CS exams)
  - Biases strongly in favor of introverted types
- Varying the types of questions (multiple choice, short answer, essay)
  - Allows for quicker grading and for a more objective assessment of a broader range of skills
- Format and layout matter (as time savers)

What Makes a Good Project?

List what you believe is the single most important factor, beyond those already mentioned, in making a good exam.

Note: Your answer will probably be CS-specific and may not hold for other disciplines.

My Take on What Makes a Good Project

Gives students exposure to practical tools used in the discipline in a professional setting

- Allows the application / exploration of key concepts in practice
- Is well constrained so that it is clear what aspects are most important to focus on
- Is reasonably well specified at the start, but not overspecified
  - Exception: if a learning goal of the course is for students to be able to dig for the requirements, as in software engineering or a capstone course

Note: Those may not hold for other disciplines.
What Makes a Nifty Assignment?
- All of the above plus:
  - Sparks curiosity and interest (perhaps by relating to a real-world interest) of students
  - Provides opportunities for bragging rights
  - Is self-contained for success
  - Has been successful and can be reused across universities / dev environments
- ...

Examples of Nifty Assignments
- Text Processing and Generation
  - Simple graphics in 142
  - One amazing result:
    - Others nifty assignments you know of?

Examples of “Almost” Nifty Assignments
- MP3 Crawler
  - http://www.cs.washington.edu/education/courses/cse594A/05w/project1.html
  - Except that most songs we would find are not those you’d want to listen to
    - This had nothing to do with the technical aspects of their work.
- Penguin Data
  - http://www.cs.washington.edu/education/courses/481ja/03sy/Groups/Group0/
  - Except that the core users didn’t appear as interested and involved
- Others you know of?

Meta-Lessons: Teaching Techniques We Used Today
- Tying material to prior lessons
- In-class discussion and activities
- Using classroom technology to engage everyone
- Shifting gears between presentation and discussion
- Meta-cognition
  - This is what we are doing right now
- One-minute feedback

One-Minute Feedback
- In one sentence, what was the most useful idea you got from today’s session or readings?
- What question still remain open for you? Be specific.