

# Diverse Student Activities For Learning Outcomes

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# Overview

- Motivation
  - Lack of diversity in many subjects
- Introducing diversity: some examples
- Activities for soft skills/graduate attributes
- Activities that attack misconceptions
- Workshop: identify activities for a 1<sup>st</sup> year subject (intro programming?)

# Traditional Monoculture

- Intro programming
  - Write a program to do X
- Systems analysis
  - Produce a data/process model for a system Y
- Data structures
  - Trace operation
  - Calculate runtime cost
  - Code operation
  - Choose between structures for situation

# “It ain’t necessarily so”

- Eg systems analysis
  - Read data/process model and answer questions
  - Invent question to ask user to decide between models
  - Find inconsistency between models
    - Different notations
    - Or different facets

# More examples

- Data structures
  - Port client code from using one ADT to using another
    - Similar concept but different API details
    - Different concept (eg priority queue rather than list)
  - Predict performance as data scales
  - Modify code to fix mistakes
  - Design API details for an ADT

# Soft skills

- Eg written communication
  - Usual is “Write a report on X for target audience Y”
  - But how about
    - Evaluate utility of report Z for target audience Y
    - Improve report Z
    - Modify report Z for different target audience
    - Discuss issues involved in designing report for given target audience (meta-assignment!)

# Graduate attributes

- Eg reflection
  - Rate your understanding against a concept map
  - Produce a concept map
  - Classify previous activities
    - Bloom's taxonomy
    - Match to stated outcomes
  - Report on how you learnt concept X
  - Invent an exam question to test concept X

# Misconceptions

- How to deal with common wrong mental models?
- “Counter-examples”
  - Show students wrong things (“Fred Foolish”)
    - Best taken from previous years assts/exams!
  - They could
    - Fix error
    - Discuss the misconception
    - Say how to educate the person with the misconception

# Workshop

- Take a first year subject you know
- Think what activities you currently ask students to perform
- Produce ideas for activities that have different style

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