

Testing

Programming I - tutorial #10

18.12.

Semester project proposals deadline

Example

My semestral project

- ‘Prší’ in Pascal
- Documentation
- + unit tests

Schedule

Semestral tests

- 17.12.
 - 7.1.
 - + additional attempts
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- Over zoom, test assignment in ReCodEx
 - More instructions next week - be prepared to have a webcam!
 - Expect assignment with focus on programming (and simple algorithms)

Abstract base classes

Shapes - class hierarchy

- We want to define *base* class Shape
 - area()
 - draw()
- What can Shape class do with such methods? Use as *abstract* class!
- Implement Circle(Shape), Square(Shape)

Shapes - abstract class problem

- Imagine someone adds `scale()` method to `Shape`
 - `Rectangle`, `Circle` needs to implement `scale()`
 - No verification `Rectangle`, `Circle` actually implements it!
 - `Rectangle` has no `scale()` implementation, calls `Shape`'s `scale()`!

Solution: ABC

Abstract Base Classes

- Module abc in python
- Base class (Shape) derives from metaclass=ABCMeta
 - Assume Rectangle() does not implement shape()
 - Now error during Rectangle object instantiation!
 - Error appears sooner, easier to debug!

Decomposition exercise

Example: Word processor

- Each word processor receives words from one source
 - File
 - Communication protocol
 - Console
- Examples of word processors
 - One which count words
 - One which prints words with alignment to column

How to reuse code effectively?

Problem decomposition

- Does each word processor implementation need to know source of words?
 - File, console, ...
- Does each word processor need to iterate directly over the source?

Testing

How to test code

Levels of isolation

- Basics
 - Testability depends on decomposition
 - Example: homework with prefix evaluation (input)
 - Example: word processors (filesystem)

Homework

Rectangles - testing

- Write tests for Rect class from one of previous assignments
 - Use testunit module
 - `from rect import Rect`
 - Cover all methods and corner-cases
 - ± 10 tests
- Submit to ReCodEx
 - Submit with no tests - 1 point for submission
 - Review later - up to 12 points