

Nifty Objects for CS0 and CS1

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SUMMARY

Examples are crucial for helping students learn new ideas. In an objects-first curriculum, the objects presented by the instructor play a key role in motivating and explaining an object-oriented approach. We know the example of a *Program* class with a *HelloWorld()* method is a bad choice. So what are good examples of objects for beginning CS students? For non-majors? What are good examples of objects for teaching conditional logic? Looping? Composition? Inheritance? In this session, OO educators present examples of objects successfully used in their CS0 and CS1 classes. Significant time will be made available for discussion of the examples.

Categories and Subject Descriptors

D.1.5 [Programming Techniques]: Object-Oriented Programming – *class, object, instantiation, invocation*. D.3.3 [Programming Languages]: Language Constructs and Features – *class, attribute, method, constructor, composition, inheritance*.

General Terms

Design, Experimentation, Languages.

Keywords

Objects-first, nifty, killer, example, object, object-oriented, pedagogy, OOP, OOD, Java, C++, CS0, CS1.

1. INTRODUCTION

Faculty embarking on an object-oriented curriculum struggle with examples that (a) motivate OO, (b) explain fundamental CS concepts, and (c) do not overwhelm the student. We know the example of a *Program* class with a *HelloWorld()* method is a bad choice. So what are some good examples to use at the start of an objects-first course? And as a course progresses in an object-centric manner, what are natural examples for introducing conditional logic? Looping? Composition? Inheritance (beyond a *Circle is-a Shape*, and a *Student is-a Person*)?

The CS community has not yet identified a large set of object-based examples for explaining common object-oriented and computer science concepts. Further compounding the problem is the lack of good object-oriented examples in the majority of CS0 and CS1 textbooks.

2. OBJECTIVES

The goal is help alleviate this problem by discussing practical, well-tested examples of objects appropriate for CS0 and CS1. A special session provides an appropriate venue for a number of OO educators to present their best examples, and allows ample time for open-ended discussion. Afterwards, the examples (and a summary of the discussion) will be posted to the web for those wishing to make immediate use in the classroom.

3. OUTLINE

Each presenter will have 5 minutes to present their example, followed by 5 minutes for discussion. The session will have a total of seven presenters: *Carl Alphonc* (University of Buffalo), *Joe Bergin* (Pace University), *Michael Caspersen* (University of Aarhus), *Stuart Hansen* (University of Wisconsin, Parkside), *James Heliotis* (Rochester Institute of Technology), *Joe Hummel* (Lake Forest College), and *Michael Kölling* (University of Kent).

4. EXPECTATIONS

The audience for this session is CS faculty teaching with an object-oriented perspective. This includes faculty following an objects-first approach, and introductory-level faculty simply looking for more realistic, motivating examples of object-orientation.

The session is important given the widespread teaching of object-oriented concepts in introductory CS. This implies that the majority of faculty teaching CS0 and CS1 would benefit from attending this session.

The session will present a total of seven distinct examples: some for use at the early stages of an objects-first course, and at least one example each focusing on conditionals, looping, composition and inheritance. The goal is for the examples to demonstrate a wide variety of CS0 and CS1 concepts, thereby maximizing their usefulness to attendees.

Feedback on the effectiveness of the session will be collected at the end in paper form. If the session is received positively, we would like to make this an annual session at SIGCSE, ultimately collecting nifty objects from the community much like the well-regarded *Nifty Assignments*.