

CS21 Practice QUIZ 6, Swarthmore College, Fall 2008

1. A **stack** is a data structure in which items are inserted at one end and must be removed from the same end. As an analogy, think of a stack of trays in a cafeteria. When you add new trays you push the whole stack down and when you remove a tray the stack pops up. Implement a **Stack** object with the following methods:

- **__init__** which creates an empty stack
- **__str__** which returns a string representing the contents of the stack
- **empty** which tests whether the stack is empty
- **push** which adds an item to the top of the stack
- **pop** which removes and returns the item at the top of the stack
- **size** which returns the number of items on the stack

You can test your class definition with the following program:

```
def main():
    s = Stack()
    if s.empty():
        print "Stack is empty"
    s.push('a')
    print s
    s.push('b')
    print s
    s.push('c')
    print s
    print s.size()
    print s.pop()
    print s
```

This program should produce the output:

```
Stack is empty
Stack: a
Stack: b a
Stack: c b a
3
c
Stack: b a
```

2. Explain the following object-oriented concepts and cite specific examples from the previous problem to illustrate your points.
 - (a) method
 - (b) instance variable
 - (c) instance of a class
 - (d) constructor
 - (e) accessor
 - (f) mutator