

Java for Non Majors

Midterm 2 Study Guide

October 29, 2019

The test consists of

1. Multiple choice questions - $20 \times 2 = 40$ points
2. Given code, single choice questions - $3 \times 5 = 15$ points
3. Code writing questions - $1 \times 20 + 10 = 30$ points
4. Code debugging - $1 \times 20 = 20$ points
5. Short answer questions - $3 \times 5 = 15$ points

Topics to study

- Topics covered for the first midterm. These will not be the focus of the test, but you should be familiar with these topics.
 - Basic Java Syntax.
 - Data types, variables, and sequential execution.
 - I/O - print statements and the Scanner class.
 - Selection statements (if - else, switch) and loops (while, do - while and for loops)
 - String
- These topics we covered after the first midterm will be the main focus of this test.
- The multiple choice will test your familiarity with the Java language and syntax.
- There are two code writing questions, which will be heavily based on the homeworks and the in-class demos, with some modifications. The code writing questions will test your knowledge of programming.
- Using java built-in libraries
 - The purpose of using packages.
 - Accessing classes in packages.
 - The default imported package in java
 - Difference between static and non-static fields and methods.
 - Two ways to generate random numbers in Java
- Classes and Objects
 - Creating an object of a pre-existing class and using the available methods.
 - Access Modifiers - public, private and protected.

- Defining a class - data attributes, constructors, accessor and mutator methods, instance methods.
- Instantiating a class (creating an object), and using instance methods.
- Difference between static and instance methods.
- The "this" keyword.
- Arrays of objects.
- Inheritance, Interfaces and Polymorphism
 - Concept of base (super) and derived (sub) classes.
 - The "super()" keyword.
 - Method overriding.
 - Abstract Classes
 - The concept of delayed or dynamic binding.
 - Casting classes
 - Interfaces

Code Writing

Design a class "Book" with the data attributes `title - String`, `author - String`, `yearPublished - integer` and `price - double`. Write a parametrized constructor that initializes the attributes. Write accessor and mutator methods, and a print method that prints all of the attributes. In the main method, create a single object and give it values of your choice. Call the print method to print the values.

Sample Run:

```
The Book is:  
The Art of Computer Programming  
Donald Knuth  
1968  
178.04
```