| Name: *(as it would appear on official course roster)* | | |
|---|---|---|
| **Umail address:** | **@umail.ucsb.edu** | section 4, 5, or 6 |
| **Optional: name you wish to be called if different from name above.** | | |
| **Optional: name of "homework buddy" (leaving this blank signifies "I worked alone"** | | |

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*You may collaborate on this homework with AT MOST one person, an optional "homework buddy".*

# H15: Due Thursday, 02.04 in Lab

H15

CS56 W16

**Garbage Collection, Polymorphism (Review of HFJ 1-13,16)**
Assigned: Mon 02.01 Total Points: 50

MAY ONLY BE TURNED IN IN THE LECTURE/LAB LISTED ABOVE AS THE DUE DATE, OR IF APPLICABLE, SUBMITTED ON GRADESCOPE. There is NO MAKEUP for missed assignments; in place of that, we drop the five lowest scores (if you have zeros, those are the five lowest scores.)

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1. (10 pts) Fill in the homework header properly—this helps us keep the grading pipeline flowing so that you get credit for your work and get feedback more quickly.

   - writing **either 4, 5, or 6** to indicate your **discussion section (lab)** meeting time
   - entering BOTH your name AND your umail address EVERY time.

   **Paper submissions**: One sheet of 8.5x11 paper double sided, or two DISCONNECTED SHEETS with your name on EACH. Please: **NO STAPLES, NO PAPERCLIPS, NO TAPE, NO ATTACHMENT OF ANY KIND**. These damage the document scanner.

   **Scanned submission**: When submitting by PDF upload: scan your pages legibly and **SCAN IN THE CORRECT ORDER**. Page 1 first, then Page 2, in the correct orientation. Failure to scan properly may result in zero credit, meaning you "use up" one of your five "drop the lowest grade" slots.

2. (10 pts) This exercise is a variation on the exercise on p. 266 in HFJ. The answer to that one appears in the book, so I suggest you try that one first, then check your answer before attempting this problem. Along with this homework, there is a separate handout (if you don't have yours, consult the homework link on the wiki---the handout is in the same web page and is part of the same "printer friendly PDF".) On the handout there is some code. Your job: figure out after which line of main() each of the following objects is eligible for garbage collection.

   - (a) The dog named Fido?
   - (b) The dog named Rover?
   - (c) The dog named Princess?
   - (d) The dog named Spot?
   - (e) The dog named Snoopy?

   If an object is still not eligible for garbage collection when the last line of main is reached, say "never". Your answer should be one of the line numbers that appears in comments in main (e.g. `/* 3 */` or `/* 7 */` ).

3. (Problem 12 from CS56 W12 Midterm 2) For this question, you need the additional handout with code for these files: Book.java, Product.java, Shippable.java, Song.java. You should have received that with this homework assignment. If you did not, you can find it online here: http://www.cs.ucsb.edu/~pconrad/cs56/16W/pdf/cs56_W16_H15_handout.pdf You may assume that all of the code on the handout compiles—I've checked that this is true. Now consider the following code, which does contain some errors, and as a result, will NOT compile.



```
/* 1*/ public class Q1 {
/* 2*/     public static void main (String [] args) {
/* 3*/
/* 4*/       Book gp =
/* 5*/         new Book("Pratchett","Going Postal",799,0.15);
/* 6*/       Song br =
/* 7*/         new Song("Lady Gaga","Bad Romance");
/* 8*/       Product slts =
/* 9*/         new Song("Nirvana","Smells Like Teen Spirit",79);
/*10*/       Shippable hp =
/*11*/         new Book("Rowling",
/*12*/             "Harry Potter & the Polymorphic Polyp",652,1.5);
/*13*/       Shippable ttc =
/*14*/         new Shippable("Dickens","Tale of Two Cities",999,1.5);
/*15*/
/*16*/       System.out.println("a:" + gp.getTitle());
/*17*/       System.out.println("b:" + br.getArtist());
/*18*/       System.out.println("c:" + br.getPrice());
/*19*/       System.out.println("d:" + slts.getPrice());
/*20*/       System.out.println("e:" + slts.getTitle());
/*21*/       System.out.println("f:" + hp.getPrice());
/*22*/       System.out.println("g:" + hp.getWeight());
/*23*/       System.out.println("h:" + hp.getTitle());
/*24*/       System.out.println("i:" + ttc.getPrice());
/*25*/       System.out.println("j:" + ttc.getPrice());
/*26*/     }
/*27*/   } // main method
/*28*/ } // class Q1
```

Please do these things with this "broken" code for the Q1 class:

a. (15 pts) Several lines need to be eliminated from this file in order to make it compile. Find the lines that are bogus, and draw a line through each of them in the code listing above. Hint: By "several", I mean more than 2, and fewer than 20. Start by determining which, if any, of the constructors are bogus. Then, eliminate any lines that refer to the variables created on those lines. Finally, check all of the remaining method calls. You will lose two points each time you strike a line that is not bogus, and you will lose two points for failing to strike any line that IS bogus. So, choose wisely. (Here, a line of code that crosses multiple physical lines counts only as "one" line for purposes of point values.)

b. (15 pts) After striking through the bogus lines, the remaining code should compile and run. So, indicate in the space below what the output will be (if any) below. Be precise. If there will no output, write "no output".