The program for problem 2:

```java
/** Exercise based on p. 266 in HFJ, for H15, W16, CS56, UCSB, P. Conrad */

public class Dog {

    private static Dog dogOfTheWeek = null;

    private String name;

    public void setAsDogOfTheWeek() {
        dogOfTheWeek = this;
    }

    public static Dog getDogOfTheWeek() {
        return dogOfTheWeek;
    }

    public Dog(String name) { this.name = name; }

    public static void main(String [] args) {
        Dog d1 = new Dog("Fido");
        Dog d2 = new Dog("Rover");
        Dog d3 = new Dog("Princess");
        Dog d4 = new Dog("Spot");
        Dog d5 = new Dog("Snoopy");

        d1.setAsDogOfTheWeek();    /*  1 */
        d1 = d2;                   /*  2 */
        Dog d6 = d3;               /*  3 */
        Dog temp = d4;             /*  4 */
        d4 = d3;                   /*  5 */
        d3 = temp;                 /*  6 */
        d2 = getDogOfTheWeek();    /*  7 */
        d4.setAsDogOfTheWeek();    /*  8 */
        d5 = null;                 /*  9 */
        d4 = null;                 /* 10 */
        d3 = null;                 /* 11 */
        d2 = null;                 /* 12 */
        d1 = null;                 /* 13 */
        temp = null;               /* 14 */
    }
}
```
Code for Problem 3:

Product.java

```java
1 */ * some thing that can be sold */
2 public abstract class Product {
3 4 */ * get the price (in cents) */
5 public abstract int getPrice();
6 7 }
```

Shippable.java

```java
1 */ * some thing that can be ship ped */
2 public interface Shippable {
3 4 */ * get the shipping weight in pounds */
5 public double getWeight();
6 }
```

Book.java

```java
1 */ * A Book */
2 public class Book extends Product implements Shippable {
3 4 private int price;
5 private double weight;
6 private String author;
7 private String title;
8 9 public Book(String author, String title, int price,
10 double weight) {
11 this.author = author;
12 this.title = title;
13 this.price = price;
14 this.weight = weight;
15 }
16 17 public int getPrice() {return this.price;}
18 public String getTitle() {return this.title;}
19 public String getAuthor() {return this.author;}
20 public double getWeight() {return this.weight;}
21 22 }
```

Song.java

```java
1 */ * A downloadable Song */
2 public class Song extends Product {
3 4 private int price;
5 private String artist;
6 private String title;
7 8 public Song(String artist, String title, int price) {
9 this.artist = artist;
10 this.title = title;
11 this.price = price;
12 }
13 14 public Song(String artist, String title) {
15 this(artist, title, 99);
16 }
17 18 public int getPrice() {return this.price;}
19 public String getTitle() {return this.title;}
20 public String getArtist() {return this.artist;}
21 22 }
```