6.5 Information hiding revisited.

- Listing 6.18 An Insecure Class
  - » PetPair.java

```java
// Listing 6.18
/**
Class whose privacy can be breached.
*/
public class PetPair
{
    private Pet first, second;

    public PetPair (Pet firstPet, Pet secondPet)
    {
        first = firstPet;
        second = secondPet;
    }
}
```

```java
public Pet getFirst ()
   {
      return first;
   }

public Pet getSecond ()
   {
      return second;
   }


   public void writeOutput ()
   {
      System.out.println ("First pet in the pair:");
      first.writeOutput ();
      System.out.println ("\nSecond pet in the pair:");
      second.writeOutput ();
   }
}
```

```
C:\WINDOWS\system32\cmd.exe

Our pair:
First pet in the pair:
Name: Faithful Guard Dog
Age: 5 years
Weight: 75.0 pounds

Second pet in the pair:
Name: Loyal Companion
Age: 4 years
Weight: 60.5 pounds

Our pair now:
First pet in the pair:
Name: Dominion Spy
Age: 1200 years
Weight: 500.0 pounds

Second pet in the pair:
Name: Loyal Companion
Age: 4 years
Weight: 60.5 pounds
The pet wasn't so private!
Looks like a security breach.
계속하려면 아무 키나 누르십시오 . . . _
```

Listing 6.19 Changing Private Data in a Poorly Defined Class. - Hacker.java

```java
// Listing 6.19

/**
Toy program to demonstrate how a programmer can access and
change private data in an object of the class PetPair. */
public class Hacker
{
    public static void main (String [] args)
    {
        Pet goodDog = new Pet ("Faithful Guard Dog", 5, 75.0);
        Pet buddy = new Pet ("Loyal Companion", 4, 60.5);
        PetPair pair = new PetPair (goodDog, buddy);
        System.out.println ("Our pair:");
        pair.writeOutput ();
```
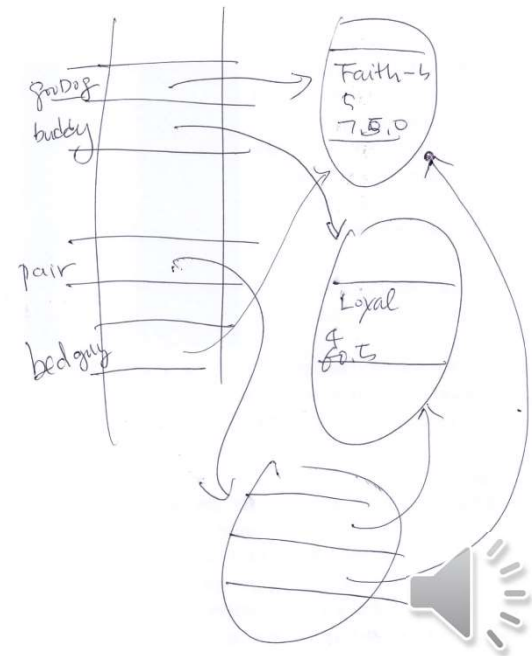
```java
            pair.writeOutput ();
            Pet badGuy = pair.getFirst ();
            badGuy.setPet ("Dominion Spy", 1200, 500);
            System.out.println ("\nOur pair now:");
            pair.writeOutput ();
            System.out.println ("The pet wasn't so private!");
            System.out.println ("Looks like a security breach.");
        }
    }
```
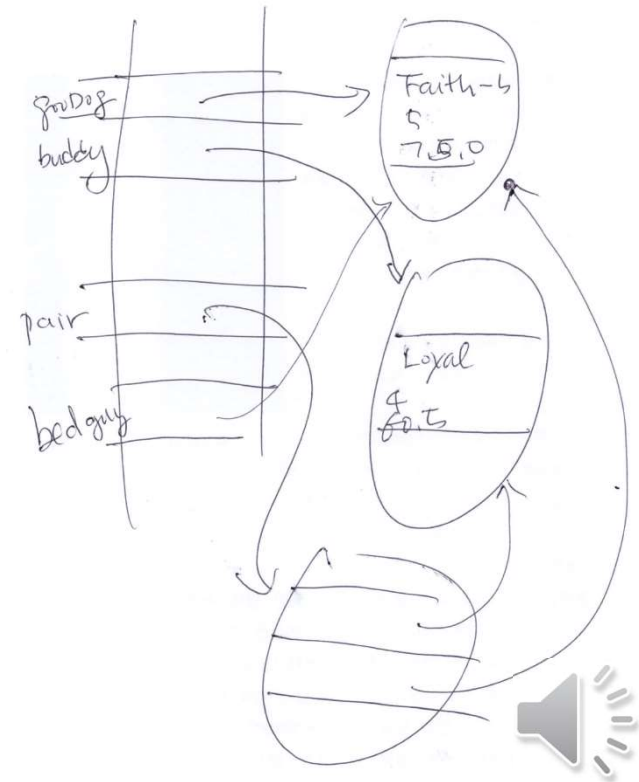
```java
    public Pet getFirst ()
        {
            return first;
        }
```

```java
/**
Class for basic pet data: name, age, and weight.
*/
public class Pet
{
    private String name;
    private int age; //in years
    private double weight; //in pounds

    public Pet ()   // default constructor
    {
        name = "No name yet.";
        age = 0;
        weight = 0;
    }

    public Pet (String initialName, int initialAge,
            double initialWeight)
    {
        name = initialName;
        if ((initialAge < 0) || (initialWeight < 0))
        {
            System.out.println ("Error: Negative age or weight.");
            System.exit (0);
        }
        else
        {
            age = initialAge;
            weight = initialWeight;
        }
    }
}
```

```java
public void setPet (String newName, int newAge,
        double newWeight)
   {
      name = newName;
      if ((newAge < 0) || (newWeight < 0))
      {
         System.out.println ("Error: Negative age or weight.");
         System.exit (0);
      }
      else
      {
         age = newAge;
         weight = newWeight;
      }
   }

   public Pet (String initialName)
   {
.....
   }

   public void setName (String newName)
   {
.....
   }


   …………………..

}
```

```
C:\WINDOWS\system32\cmd.exe

Our pair:
First pet in the pair:
Name: Faithful Guard Dog
Age: 5 years
Weight: 75.0 pounds

Second pet in the pair:
Name: Loyal Companion
Age: 4 years
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```
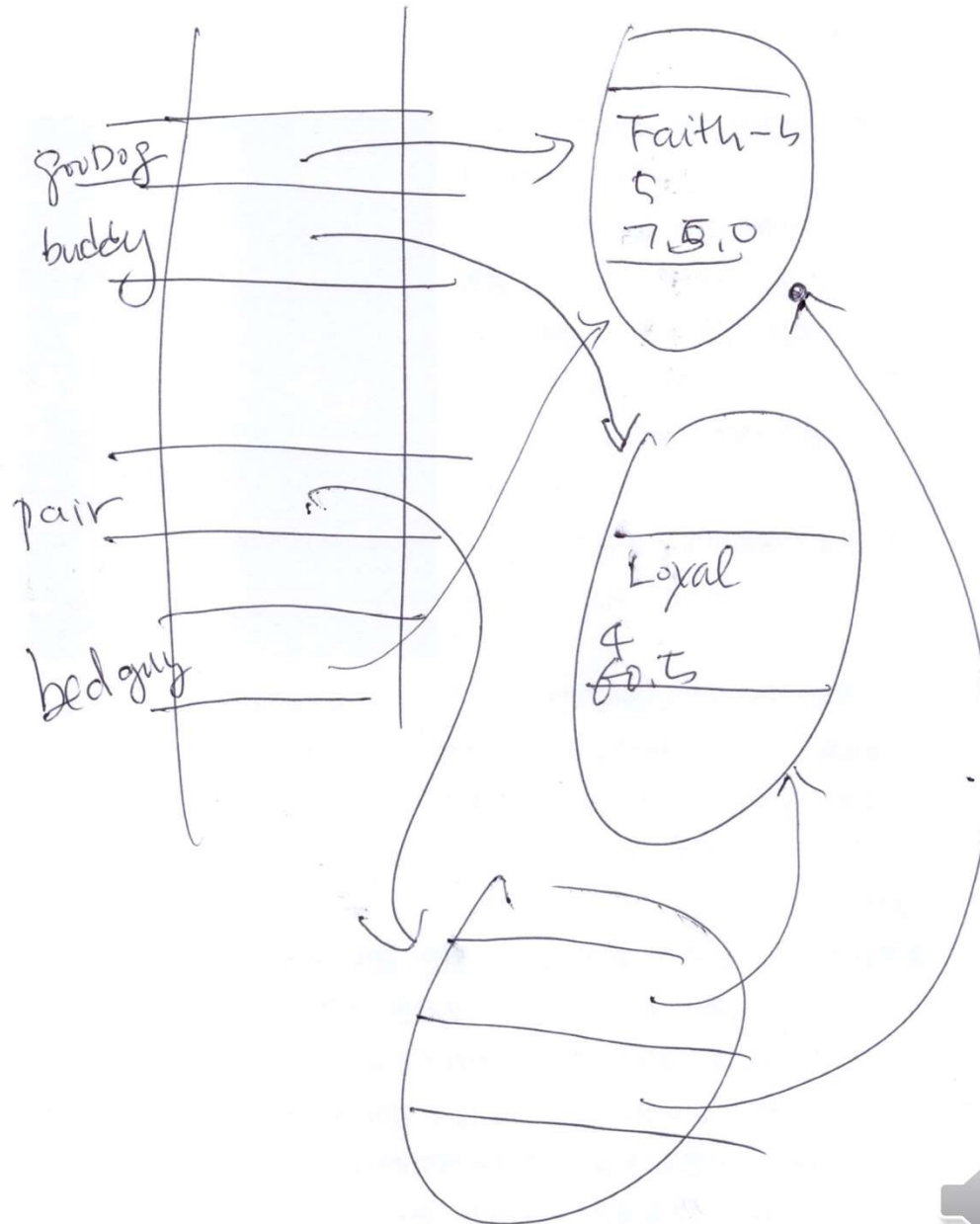
Gotcha : Privacy Leaks

- **Using instance variables of a class type** takes special care

- The problem stems from the fact that, unlike primitive types, object identifiers contain <u>the object's ███████</u>, not its value
  - » <u>**returning an object**</u> gives back the address, so the called method has direct access to the object
  - » the object is "███████████(usually undesirable)

- solution:
  - » 1) stick to returning ███████████(`int`, `char`, `double`, `boolean`, `etc.`) or `String`

  - » 2) Best solution: ████████, see Appendix 8

리턴 type이 클래스면 문제가 생김