Homework 1

If a problem consists of multiple classes, you can assume the classes are contained in the same .java file.

1. (5 pts) Explain why this code does not compile. Explain two solutions for fixing the error. What value is assigned to instance variable v for each proposed solution?

```
1 public class MyClassA {
2   int v = 12;
3
4   public MyClassA (int pV) {
5     v = pV;
6   }
7
8   public static void main (String args []) {
9     MyClassA m = new MyClassA ();
10  } // end main
11 } // end class MyClassA
```

2. (5 pts) Explain why this code does not compile. How would you fix it? What value is assigned to instance variable v based on your solution?

```
1 public class MyClassB {
2   int v = 12;
3
4   public void MyClassB (int pV) {
5     v = pV;
6   }
7
8   public static void main (String args []) {
9     MyClassB m = new MyClassB (23);
10  } // end main
11 } // end class MyClassB
```

3. (5 pts) Explain why this code has a logic error. How would you fix it? What value is assigned to instance variable v based on your solution?

```
1  public class MyClassD {
2      public static void main(String args[]) {
3          MyClassC m = new MyClassC(23);
4      }
5  }
6
7  class MyClassC {
8      int v = 12;
9      public MyClassC(int pV) {
10         int v = pV;
11     }
12 }
```

4. (5 pts) Explain why this code does not compile. How would you fix it? What value is assigned to instance variable v based on your solution?

```
1  public class MyClassE {
2   public static void main (String args []) {
3    MyClassF m = new MyClassF (23);
4   } // end main
5  } // end class MyClassE
6
7  class MyClassF {
8   int v = 12;
9
10   private MyClassF (int pV) {
11    v = pV;
12   }
13
14  } // end class MyClassF
```

5. (5 pts) Given all the issues identified in problems 1 through 4, explain in detail why the following code compiles without errors and initializes the instance variable based on the existing constructor call in the main method. What value is assigned to instance variable v?

```
1  public class MyClassG {
2   public static void main (String args []) {
3    MyClassH m = new MyClassH (23, true);
4   } // end main
5  } // end class MyClassG
6
7  class MyClassH {
8   int v = 12;
9
10   public MyClassH (int x, boolean b) {
11    this (x);
12   }
13
14   private MyClassH (int pV) {
15    v = pV;
16   }
17
18 } // end class MyClassH
```

6. (5 pts) Explain why the following class hierarchy is not reasonable:

- DefenseDepartment
  - General
    - Private

7. (5 pts) Give at least one example of a reasonable field for each class in the following class hierarchy. Be sure the field is at the right level of the hierarchy.

    - Vehicle
        - Car
        - Airplane
            - Passenger
            - Fighter
            - Bomber
        - Spaceship

8. (5 pts) Give at least one example of a reasonable method for each class in the following class hierarchy. Be sure the method is at the right level of the hierarchy. Do not include constructors, getters, or setters.

    - Vehicle
        - Car
        - Airplane
            - Passenger
            - Fighter
            - Bomber
        - Spaceship

9. (5 pts) Describe a class model consisting of three classes where two of the classes are in an association relationship with each other, and two of the classes are in an inheritance relationship.

10. (5 pts) Describe a class hierarchy containing at least 5 classes to model trees (like the kind you find in a forest). Give a short explanation for why the classes you are proposing are in good parent-child relationships.

Grading Rubric:

Attribute	Meets	Does not meet
Problem 1	**5 points** Explains the compiler error. Explains two solutions for fixing the error. Describes correct value assigned to instance variable v for each solution.	**0 points** Does not explain compiler error. Does not explain two solutions for fixing the error. Does not describe correct value assigned to instance variable v for each solution.
Problem 2	**5 points** Explains the compiler error. Explains how to fix it. Describes correct value assigned to instance variable v.	**0 points** Does not explain compiler error. Does not explain how to fix it. Does not describe correct value assigned to instance variable v.
Problem 3	**5 points** Explains the logic error. Explains how to fix it. Describes correct value assigned to instance variable v.	**0 points** Does not explain logic error. Does not explain how to fix it. Does not describe correct value assigned to instance variable v.
Problem 4	**5 points** Explains the compiler error. Explains how to fix it. Describes correct value assigned to instance variable v.	**0 points** Does not explain compiler error. Does not explain how to fix it. Does not describe correct value assigned to instance variable v.
Problem 5	**5 points** Given the issues identified in problems 1 through 4, explains in detail why the code compiles without errors and initializes the instance variable based on the constructor call in the main method. Describes the correct value assigned to instance variable v.	**0 points** Given the issues identified in problems 1 through 4, does not adequately explain why the code compiles without errors and initializes the instance variable based on the constructor call in the main method. Does not describe the correct value assigned to instance variable v.
Problem 6	**5 points** Explains why the class hierarchy is not reasonable.	**0 points** Does not explain why the class hierarchy is not reasonable.

Problem 7	**5 points** Gives at least one example of a reasonable field for each class. The field is at the right level of the hierarchy.	**0 points** Does not give at least one example of a reasonable field for each class. The field is not at the right level of the hierarchy.
Problem 8	**5 points** Gives at least one example of a reasonable method for each class. The method is at the right level. Does not include constructors, getters or setters.	**0 points** Does not give at least one example of a reasonable method for each class. The method is not at the right level. Includes constructors, getters or setters.
Problem 9	**5 points** Describes a class model consisting of three classes. Describes an association relationship between two of the classes. Describes an inheritance relationship between two of the classes.	**0 points** Does not describe a class model consisting of three classes. Does not describe an association relationship between two of the classes. Does not describe an inheritance relationship between two of the classes.
Problem 10	**5 points** Describes a class hierarchy containing at least 5 classes to model trees. Gives a short explanation for why the classes are in good parent-child relationships.	**0 points** Does not describe a class hierarchy containing at least 5 classes to model trees. Does not give a short explanation for why the classes are in good parent-child relationships.