UML Assignment

1. Dan is making a "Space Invaders" type game. He has decided to use inheritance to represent objects that move within the game. To do this he has designed an abstract class named Sprite that will include all behavior necessary for an object to appear on the screen and move in any direction. The classes that will be derived from the Sprite class include SpaceShip, Alien, and Phaser.

   Construct a UML diagram that illustrates this relationship.

2. A class named Student contains three private instance variables of type String named ID, firstName, and lastName. It also includes two constructors, a default constructor and a constructor that declares three parameters representing the three instance variables.
   The class also includes three accessor methods, three mutator methods, and a toString method.

   Construct a UML diagram that illustrates the Student class's design.

```
public class MarchingBand
{
      // instance variables
      private Member[] band;
      private int numMembers;

      // constructor
      public Band()
      {    /* implementation not shown */   }

      public void addMember(Member member)
      {    /* implementation not shown */   }

      public void displayMembers()
      {    /* implementation not shown */   }

      public Member getMember(String firstname, String lastname)
      {    /* implementation not shown */   }
}

public class Member
{
      // instance variables
      private String firstName
      private String lastName;
      private String instrumentPlayed;

      // constructor
      public Member(String first, String last, String instrument)
      {    /* implementation not shown */   }
}
```

3. Construct an UML diagram that illustrates the relationship between the two classes above.