

Inheritance Practice and Polymorphism Notes

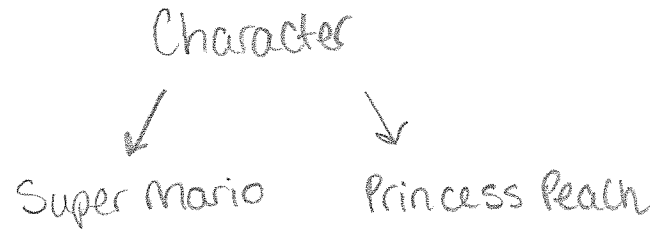
On the next two pages define the methods and constructors below for a Character and SuperMario Class.

```
public class Character {
    private int numLives;
    private String name;
    public Character(String nam, int num)
    { /* Implementation not shown */ }

    public int getNumLives()
    { /* Implementation not shown */ }

    public String getName()
    { /* Implementation not shown */ } }

    public String toString()
    { /* Implementation not shown */ } }
```



```
public class SuperMario extends Character {
    private boolean hasFrogSuit;
    public SuperMario(int num, boolean frogSuit)
    { /* Implementation not shown */ }

    public int doubleNumLives()
    { /* Implementation not shown */ }

    public boolean isAFrog()
    { /* Implementation not shown */ }

    public String toString()
    { /* Implementation not shown */ } }
```

// practice constructing a Character and SuperMario object below

```
public static void main(String[] args)
```

```
{
```

```
    → Character m1 = new Super Mario( 2, true);
```

```
    Super Mario m2 = new Character();
```

↑ variable type cannot go 'up' the inheritance tree

```
    m1.doubleNumLives();
```

↑ variable type dictates the methods it can access. 'Character' does not have access to doubleNumLives()

```
}
```

Variable Type

Object type

Consider the following class definition:

```
public class Character
{
    private int numLives;
    private String name;

    /**
     * Complete the constructor to initialize the instance variables
     * @param nam the character's name
     * @param num the characters number of lives remaining
     */

    public Character(String nam, int num)
    {
        name = nam;
        numLives = num;
    }

    public int getNumLives()
    { return numLives; }

    public String getName()
    { return name; }

    /* Complete the toString() method that will return the name and number of lives of the character
     * So for Luigi, with 5 lives left, your output would be:
     * Name: Luigi
     * Lives Left: 5"
     */

    public String toString()
    { return "Name: " + name + "Lives Left: " +
      numLives;
    }
}
```