

CS 112 Lab Practicum #3

October 10 2025

Playing a Sticker Trading Game

Suppose you are playing a game where a group of players have to work together to collect a certain number of colored stickers to achieve points. You will be designing the **Player** class, and will be employing proper encapsulation while designing the class.

Each instance of the **Player** class should represent a single player in the game, and each player can have stickers of different colors (which are “red”, “yellow”, “green”, “blue”, and “purple”). All players are working together to win points, so there is also an overall point counter.

Complete the following tasks using the comments in the provided template code as your guide. *Hint:* consider what data type/structure would be useful for tracking the below information, and whether these should be static or non-static.

1. Define **one** variable to keep count of the points the players have scored altogether.
2. Define **one** variable to keep inventory of the stickers a player has. For example, a player could have 3 red, 2 yellow, 1 green, 0 blue, and 2 purple stickers.
3. Write a default constructor so that a player starts with no stickers and 0 points.
4. Write a method called **trade** that will have the following header:

```
_____ trade(Player other, String mySticker, String otherSticker)
```

where the current player can trade one sticker (**mySticker**) with a sticker from the other player (**otherSticker**). For example, here is the state of the players’ sticker inventories before and after the call `p1.trade(p2, "green", "purple")`:

Before		After	
p1	p2	p1	p2
3 green	0 green	2 green	1 green
2 purple	5 purple	3 purple	4 purple
...	...	...	...

Note that **p1** “trades” one green sticker for one purple sticker from **p2**. If a player tries to trade a sticker color that does not exist, an **IllegalArgumentException** should be thrown.

5. Write a method called **winPoints** which increments the point count by 1 every time the player has at least 3 stickers of the one color. The 3 stickers should then be removed from the player’s inventory. **winPoints** only acts upon the player the method is called on. Here is the state of a player’s inventory and points before and after one call to **winPoints**:

Before	After
1 green	1 green
4 purple	1 purple
3 blue	0 blue
...	...
2 points	4 points

Note 1: You may create any helper methods as you see fit!

Note 2: You can assume you have access to a class called **ArrayMethods** which includes a method that can be used to check if **String s** is an element of **Array a**.

```
public static boolean isValid( String a[], String s) {
    boolean valid = false;
    for (int i = 0; i < a.length && !valid; i++ )
        if (a[i].equals(s) )
            valid = true;
    return(valid);
}
```

```
public class Player {
    public static final String[] COLORS = {"red", "yellow", "green",
                                           "blue", "purple"};
    //Define your point counter variable here (1)
```

```
    //Define your sticker inventory variable here (2)
```

```
    //Write your default constructor here (3)
```

```
//Other methods
```

```
//write your trade and winPoints methods here (4 & 5)
```

```
}
```