

# Refactoring Code

- Change in Player Class:

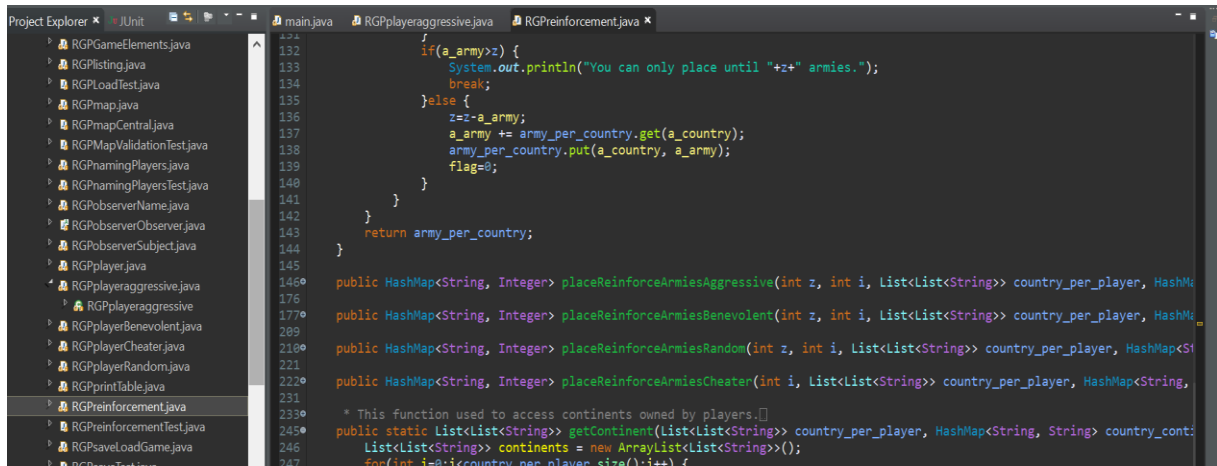
- We added new functionality in player class to ease our strategy as we created new classes such as RGPplayerAggressive, RGPplayerBenevolent, RGPplayerRandom, RGPplayerCheater.
- This strategy player classes implements player class and are changed as required by the mode they are playing.

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1 import java.io.File;
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7 public class RGPplayer {
8     public int reinforcement(HashMap<String, Integer> army_per_country, List<List<String>> country_per_player, int j, int total
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70 public void attack(String attack_country, int i, List<List<String>> country_per_player, File file, String defend_country, A=
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```

- **Changes in Phases:**

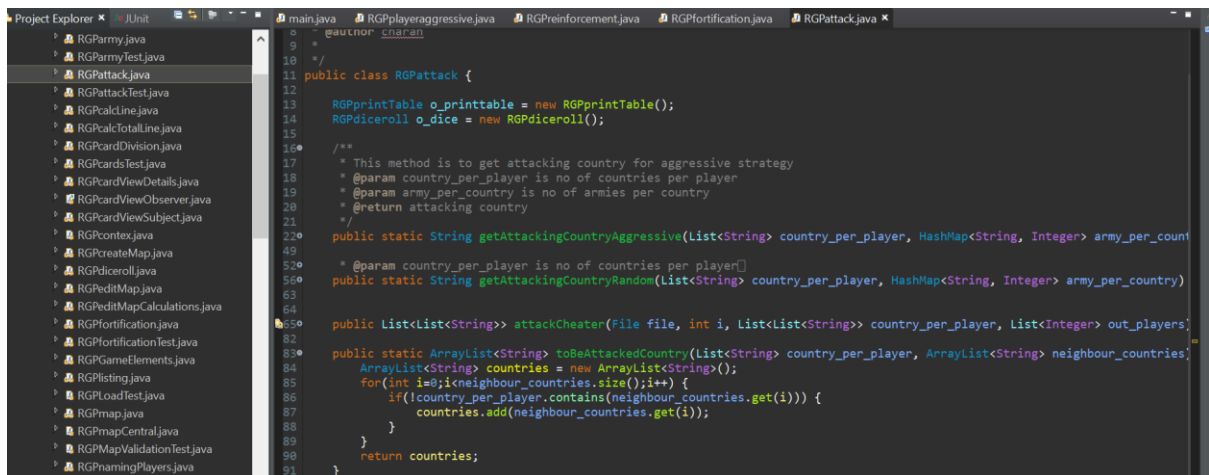
- Changes were made in Reinforcement Phase, Attack Phase, Fortification Phase as to play using new strategies.

## **Reinforcement:**



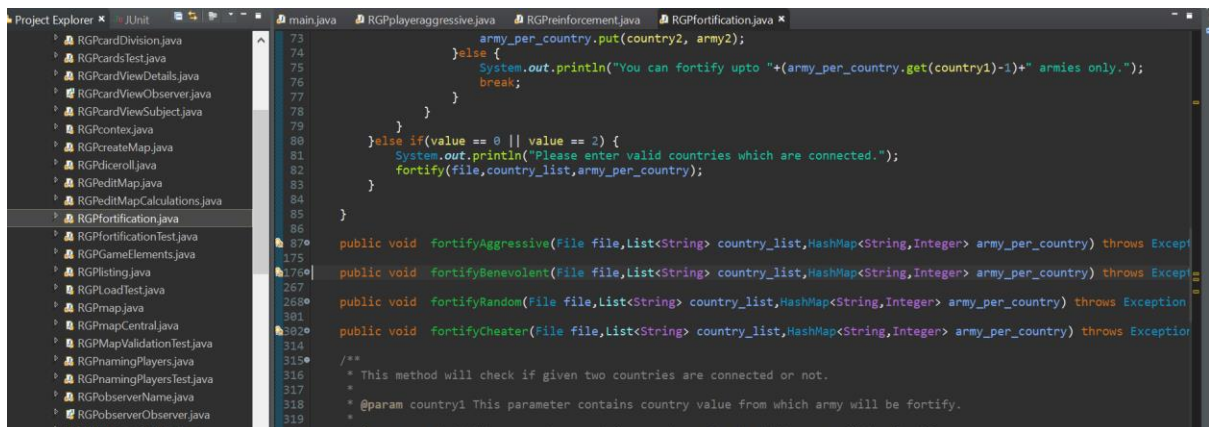
```
132     if(a_army>z) {
133         System.out.println("You can only place until "+z+" armies.");
134         break;
135     }else {
136         z=z-a_army;
137         a_army += army_per_country.get(a_country);
138         army_per_country.put(a_country, a_army);
139         flag=0;
140     }
141 }
142 }
143 return army_per_country;
144 }
145 }
146
147 public HashMap<String, Integer> placeReinforceArmiesAggressive(int z, int i, List<List<String>> country_per_player, HashMa
176 public HashMap<String, Integer> placeReinforceArmiesBenevolent(int z, int i, List<List<String>> country_per_player, HashMa
209 public HashMap<String, Integer> placeReinforceArmiesRandom(int z, int i, List<List<String>> country_per_player, HashMa
210 public HashMap<String, Integer> placeReinforceArmiesCheater(int i, List<List<String>> country_per_player, HashMap<String,
221
222 public HashMap<String, Integer> placeReinforceArmiesCheater(int i, List<List<String>> country_per_player, HashMap<String,
231
232 * This function used to access continents owned by players.[]
233 public static List<List<String>> getContinent(List<List<String>> country_per_player, HashMap<String, String> country_conti
246 List<List<String>> continents = new ArrayList<List<String>>();
247 for(int i=0;i<country_per_player.size();i++) {
```

## **Attack:**



```
10  *
11  */
12
13 RGPprintTable o_printtable = new RGPprintTable();
14 RGPdiceroll o_dice = new RGPdiceroll();
15
16 /**
17  * This method is to get attacking country for aggressive strategy
18  * @param country_per_player is no of countries per player
19  * @param army_per_country is no of armies per country
20  * @return attacking country
21  */
22 public static String getAttackingCountryAggressive(List<String> country_per_player, HashMap<String, Integer> army_per_count
23
24 * @param country_per_player is no of countries per player[]
25 public static String getAttackingCountryRandom(List<String> country_per_player, HashMap<String, Integer> army_per_country)
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```

## **Fortify:**



```
73     army_per_country.put(country2, army2);
74 }else {
75     System.out.println("You can fortify upto "+(army_per_country.get(country1)-1)+" armies only.");
76     break;
77 }
78 }
79 }
80 }else if(value == 0 || value == 2) {
81     System.out.println("Please enter valid countries which are connected.");
82     fortify(file,country_list,army_per_country);
83 }
84 }
85 }
86 }
87
88 public void fortifyAggressive(File file,List<String> country_list,HashMap<String,Integer> army_per_country) throws Excepti
176 public void fortifyBenevolent(File file,List<String> country_list,HashMap<String,Integer> army_per_country) throws Excepti
267 public void fortifyRandom(File file,List<String> country_list,HashMap<String,Integer> army_per_country) throws Exception
268
269 public void fortifyCheater(File file,List<String> country_list,HashMap<String,Integer> army_per_country) throws Exception
314
315 /**
316  * This method will check if given two countries are connected or not.
317  *
318  * @param country1 This parameter contains country value from which army will be fortify.
319  *
320  * @param country2 This parameter contains country value to which army will be fortify.
```

- Add brackets to single line loops.
- Creating new methods.
  - In some files certain method contained too much of code so a bunch of code were extracted from the complex method to create a new method for better understanding of code as well as to reduce confusion.

**Before:**

```
ArrayList<String> new_country = new ArrayList<String>();
for(int i=0;i<noc;i++)
{
    country_names.add("country "+i);
    hm = hm1(country_names);
}
System.out.println("Elements in 1st ArrayList "+country_names);
new_country.add(country_names.remove(2));
System.out.println("Elements in 2nd ArrayList "+new_country);
System.out.println("Elements in 1st ArrayList after deletion "+country_names);
System.out.println("Elements in hashmap "+hm);

HashMap<String,Integer> a1 =new HashMap<String,Integer>();
HashMap<Object,Integer> b1 =new HashMap<Object,Integer>();
HashMap<String,Integer> c1 =new HashMap<String,Integer>();

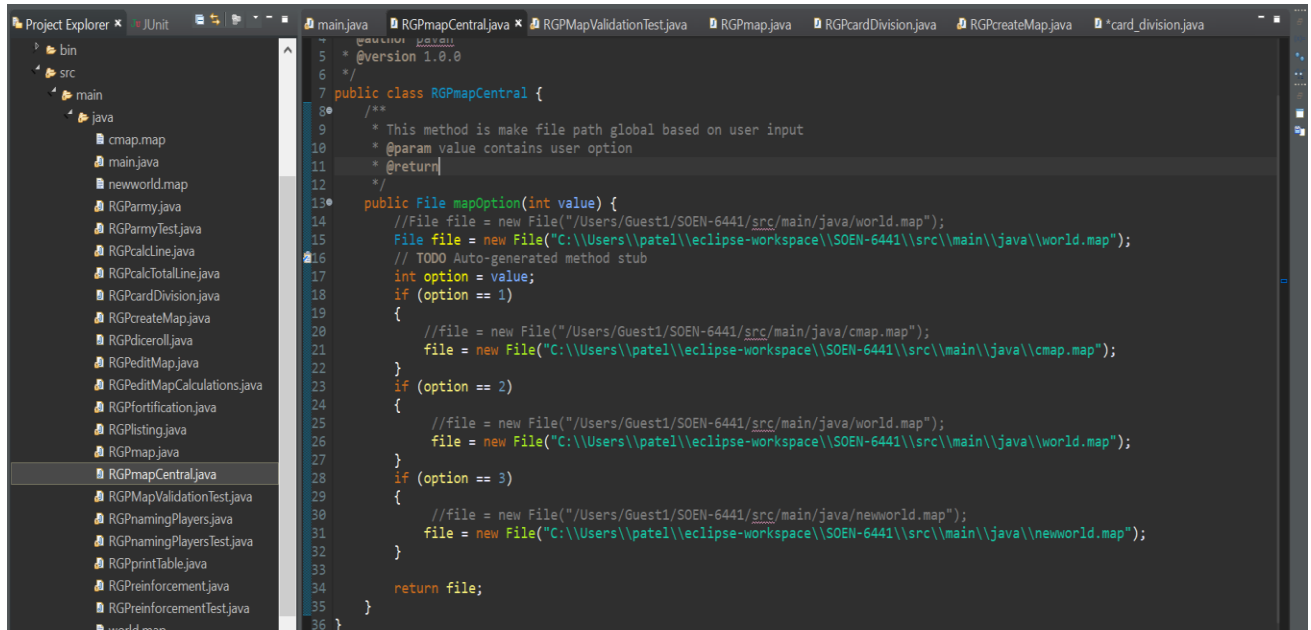
if(a1.containsValue(3) && b1.containsValue(3) && c1.containsValue(3))
{
    System.out.println("Reinforcement +8");
}
else if(a1.containsValue(2) && b1.containsValue(2) && c1.containsValue(2))
{
    System.out.println("Reinforcement +6");
}
else if(a1.containsValue(1) && b1.containsValue(1) && c1.containsValue(1))
{
    System.out.println("Reinforcement +4");
}
else if(a1.containsValue(1) && b1.containsValue(2) && c1.containsValue(3) ||
        a1.containsValue(1) && b1.containsValue(3) && c1.containsValue(2) ||
        a1.containsValue(2) && b1.containsValue(1) && c1.containsValue(3) ||
```

**After:**

```
public static void check_cards_deal(HashMap<String,Integer> a, HashMap<Object,Integer> b, HashMap<String,Integer> c) {}
public static void add_sub(ArrayList<String> a, ArrayList<String> b){}
public static void hash_add_sub(HashMap<String,Integer> a, HashMap<Object,Integer> b){}
public static Object getting_key(HashMap<String,Integer> a, Object value){}
```

- **Map modules centralized.**

- Previously several class were to be changed if there was any updation in map file.
- Now all the map modules are centralized in a Map Central Method which will occupy less space and time, as no other file would be updated rather than Map Central.



```
5  * @version 1.0.0
6  */
7  public class RGMapCentral {
8      /**
9       * This method is make file path global based on user input
10     * @param value contains user option
11     * @return
12     */
13     public File mapOption(int value) {
14         //File file = new File("/Users/Guest1/SOEN-6441/src/main/java/world.map");
15         File file = new File("C:\\Users\\patel\\eclipse-workspace\\SOEN-6441\\src\\main\\java\\world.map");
16         // TODO Auto-generated method stub
17         int option = value;
18         if (option == 1)
19         {
20             //file = new File("/Users/Guest1/SOEN-6441/src/main/java/cmap.map");
21             file = new File("C:\\Users\\patel\\eclipse-workspace\\SOEN-6441\\src\\main\\java\\cmap.map");
22         }
23         if (option == 2)
24         {
25             //file = new File("/Users/Guest1/SOEN-6441/src/main/java/world.map");
26             file = new File("C:\\Users\\patel\\eclipse-workspace\\SOEN-6441\\src\\main\\java\\world.map");
27         }
28         if (option == 3)
29         {
30             //file = new File("/Users/Guest1/SOEN-6441/src/main/java/newworld.map");
31             file = new File("C:\\Users\\patel\\eclipse-workspace\\SOEN-6441\\src\\main\\java\\newworld.map");
32         }
33     }
34     return file;
35 }
36 }
```

- **Consolidate Duplicate Conditional Fragments:**

- Previously, same fragment of code was in all branches of a conditional expression, so by refactoring them by moving it outside of the expression and adding the fragment after all the conditions were completed.

- **Adding brackets.**

- In many methods the control statement which have one line of command were not having brackets.
- This created confusion so brackets were added to reduce confusion.

**Before:**

```
public File mapOption(int value) {  
    //File file = new File("/Users/Guest1/SOEN-6441/src/main/java/world.map");  
    File file = new File("C:\\Users\\patel\\eclipse-workspace\\SOEN-6441\\src\\main\\java\\world.map");  
    // TODO Auto-generated method stub  
    int option = value;  
    if (option == 1)  
        file = new File("C:\\Users\\patel\\eclipse-workspace\\SOEN-6441\\src\\main\\java\\cmap.map");  
    if (option == 2)  
        file = new File("C:\\Users\\patel\\eclipse-workspace\\SOEN-6441\\src\\main\\java\\world.map");  
    if (option == 3)  
        file = new File("C:\\Users\\patel\\eclipse-workspace\\SOEN-6441\\src\\main\\java\\newworld.map");  
}
```

**After:**

```
if (option == 1)  
{  
    //file = new File("/Users/Guest1/SOEN-6441/src/main/java/cmap.map");  
    file = new File("C:\\Users\\patel\\eclipse-workspace\\SOEN-6441\\src\\main\\java\\cmap.map");  
}  
if (option == 2)  
{  
    //file = new File("/Users/Guest1/SOEN-6441/src/main/java/world.map");  
    file = new File("C:\\Users\\patel\\eclipse-workspace\\SOEN-6441\\src\\main\\java\\world.map");  
}  
if (option == 3)  
{  
    //file = new File("/Users/Guest1/SOEN-6441/src/main/java/newworld.map");  
    file = new File("C:\\Users\\patel\\eclipse-workspace\\SOEN-6441\\src\\main\\java\\newworld.map");  
}
```

- **Restructuring of code.**

- There were many “if..else” statements, they created ambiguity in code. So some were replaced by other methods and some were replaced by “switch(..)” statement.
- Refactoring by combining them into a single conditional expression and extracting it.

- **Remove unnecessary comments.**

- Comments were written to describe different methods or variables. Now variables are changed to appropriate “self-explanatory” name so unnecessary comments are now deleted.

**Before:**

```
public static void main(String args[]){
    int noc=10;                                     //no of countries;
    HashMap<String,Integer> hm = new HashMap<String,Integer>();
    ArrayList<String> c1 = new ArrayList<String>();    // country 1
    ArrayList<String> c2 = new ArrayList<String>();    // country 2
    for(int i=0;i<noc;i++){                          // if condition for adding country to Arraylist
        c1.add("country "+i);
        hm = hm1[c1];
    }
}
```

**After:**

```
public static void main(String args[]){
    int no_countries = 42;
    HashMap<String,Integer> hm = new HashMap<String,Integer>();
    ArrayList<String> country_1 = new ArrayList<String>();
    ArrayList<String> country_2 = new ArrayList<String>();
    for(int i=0;i<no_countries;i++){
        country_1.add("country "+i);
        hm = hm1[country_1];
    }
}
```

- **Renaming of Necessary Variables and Methods.**

- Adding new functionalities to the project tends to add new methods and class, because of that some methods and classes were renamed, so as to remove unambiguity and create a clear picture of each and every method.

**Before:** We had a single method doing map validation, creating and editing.

**After:** Separate classes for each method were created, so as to avoid confusion and were easy to maintain.