

Refactoring Code

- 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) {}

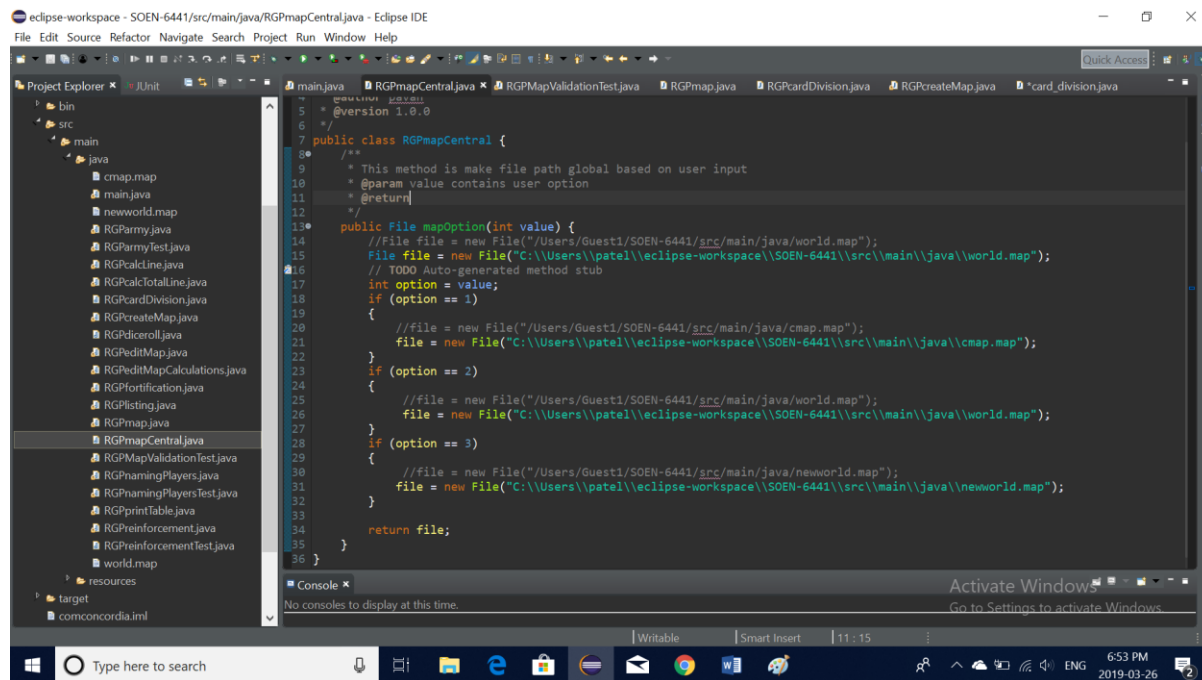
public static void add_sub(ArrayList<String> a, ArrayList<String> b){}

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.



- **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:

```
public File mapOption(int value)  
{  
    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.

- **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.