# Advanced Programming Practices Project - Build 2 Refactoring Document

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# Contents:

# 1.Potential refactoring targets

1. **Edit Command pattern change:**

   In build 1, the code was designed to accept commands in the pattern with comma.
   eg: **editcountry -add india, china, austria**
   In build 2, it is updated as per guideline. So, the updated code will accept only if the command is given like the below example.
   eg: **editcountry -add india -add china -add austria -remove srilanka**

2. **Map alteration as per Domination game format:**

   In build 1. For convenient reading and writing to text file, code was written in such a way to pull or update data to three individual files(continent, country, border). In build 2, it is updated as per guidelines, reading/saving/updating data happen in a .map file according to Domination game format.

3. **showmap view improvement:**

   In build 1, map was displayed after **showmap** command in a non-legible manner. It is updated in build 2, in a such a way where map is displayed with continent and its corresponding countries with the respective borders.

4. **Sub-graph connectivity update:**

   In build 1, Data has been read from .map file to construct a java map, in that map object countries and borders were connected. But countries were not connected to its respective continents. In build 2 the appropriate fix is implemented to have sub-graph connectivity

5. **Check for duplicate players:**

   In build 1, while adding gameplayer duplicate players could start the game. It was identified as a fix and the necessary code changes are done to not allow same players in build 2.

6. **Updated methods in player class:**

   In build1, player class didn't have few methods as per Build1 handout document. It was identified as fix and necessary changes are done to have those methods.

7. **Fixed calculation of reinforcement armies:**

   In build 1, reinforcement armies were not calculated properly, and continent based bonus count were not picked from the input file. In build 2, the continent bonus values are picked from input file and calculated as per domination game rules.

8. **Altered order for issueOrder command:**

In build 1, Code was written in such a way, once a player completes full deployment of their armies the next player was allowed. It was identified as fix and its updated in build 2, to issue order alternatively by each player turn.

9. **CI/CD pipeline wasn't implemented:**

In build1, CI/CD pipeline wasn't implemented. In build2, it has been implemented for every commit code compilation, Javadoc generation happens as per the requirement.

10. **Description was missing for few classes:**

In build 1, few classes weren't updated with Javadoc, that has been rectified in build 2

11. **Game Log implementation**

As a part of observer pattern, for every command executed during application is being stored in a log file with timestamp and the effect of each command.

12. **Altered high level design**

Created one folder for every module in the high-level design and tests are in a separate folder that has the exact same structure as the code folder, 1-1 relationship between tested classes and test classes are followed in the project folder hierarchies.

13. **Sonar lint integration**

To attain the best code quality, Sonar lint plugin is integrated to check coding standard on the fly while writing the code.

14. **Author correction in git**

In GIT repository, the actual commit count was not reflecting, then the problem has been identified that the code was not committed with the proper git credentials. As a fix, using advanced git commands, author details for few commits has been changed.

15. **improved architecture design.**

Architecture design has been improved for build 2, The designed architecture depicts and incorporated design patterns like observer, command and state patterns.

# 2.Actual refactoring targets

❖ Edit Command pattern change:

❖ Map alteration as per Domination game format

❖ showmap view improvement

❖ Check for duplicate players

❖ Fixed calculation of reinforcement armies

# 3.Refactoring operations

1. **Edit Command pattern change**

   **Necessity of refactoring operation :**

   In build 1, the code was designed to accept commands in the pattern with comma.
   eg: **editcountry -add india, china, austria**
   In build 2, it is updated as per guideline. So, the updated code will accept only if the command is given like the below example.
   eg: **editcountry -add india -add china -add austria -remove srilanka.**

   **Before Refactoring :**

```
Edit Map Format:
editcontinent -add continentID continentvalue -remove continentID
editcountry -add countryID continentID -remove countryID
editneighbor -add countryID neighborcountryID -remove countryID neighborcountryID
enter 1 to return
editcountry -add 41 1, 42 2
command format is incorrect
```

   **After Refactoring :**

```
Edit Map Format:
editcontinent -add continentID continentvalue -remove continentID
editcountry -add countryID continentID -remove countryID
editneighbor -add countryID neighborcountryID -remove countryID neighborcountryID
enter 1 to return
editcountry -add 41 1 -add 42 2
Files updated
```

## 2. Map alteration as per Domination game format

**Necessity of refactoring operation :**

In build 1, For convenient reading and writing to text file, code was written in such a way to pull or update data to three individual files(continent, country, border). In build 2, it is updated as per guidelines, reading/saving/updating data happen in a .map file according to Domination game format.
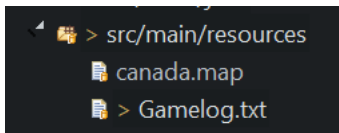
**Before Refactoring :**

Application had three different files to read and write which is not recommended according to guideline.

```
▲ ▪ source.canada
    ▪ canada-borders1.txt
    ▪ canada-continents.txt
    ▪ canada-countries.txt
```
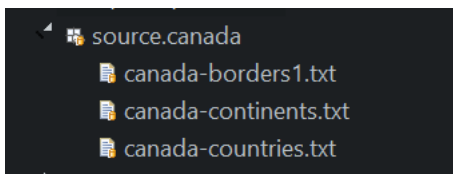
**After Refactoring :**

Application has only one file .map to read and write.

```
▲ ▪ > src/main/resources
    ▪ canada.map
    ▪ > Gamelog.txt
```

```
[Continents]
1 Atlantic_Provinces 3
2 Ontario_and_Quebec 4
3 Western_Provinces-South 3
4 Western_Provinces-North 2
5 Nunavut 3
6 Northwestern_Territories 2

[Countries]
1 New_Brunswick 1
2 Prince_Edward_Island 1
3 Nova_Scotia 1
4 N&L-Newfoundland 1
5 N&L-Labrador 1
6 Quebec-North 2
7 Quebec-Central 2
8 Quebec-South 2

[Borders]
1 2 3 8
2 1 3
3 1 2 4
4 3 5 7
5 4 6 7
6 22 23 5 7
7 11 4 5 6 8
8 1 7 9
```

### 3. showmap view improvement:

In build 1, map was displayed after **showmap** command in a non-legible manner. It is updated in build 2, in a such a way where map is displayed with continent and its corresponding countries with the respective borders.

**After Refactoring :**

```
Continent and its Countries

ContinentId: 1, ContinentName: Tamil_Nadu-->
CountryId: 1, CountryName: Chennai
CountryId: 2, CountryName: Coimbatore


ContinentId: 2, ContinentName: Andhra_Pradesh-->
CountryId: 4, CountryName: Guntur
CountryId: 3, CountryName: Hyderabad


ContinentId: 3, ContinentName: Kerala-->
CountryId: 6, CountryName: Trivandram
CountryId: 5, CountryName: Kochin



Countries and its Borders


CountryId: 1, CountryName: Chennai--->
2, 3

CountryId: 2, CountryName: Coimbatore--->
1, 3

CountryId: 4, CountryName: Guntur--->
3, 6

CountryId: 3, CountryName: Hyderabad--->
, 2, 4

CountryId: 6, CountryName: Trivandram--->
4, 5

CountryId: 5, CountryName: Kochin--->
4, 6
```

4. **Check for duplicate players:**

   In build 1, while adding gameplayer duplicate players could start the game. It was identified as a fix and the necessary code changes are done to not allow same players in build 2.

   **Before Refactoring :**

   Duplicate players will be accepted by the application.

   **After Refactoring :**

```
Gameplay Format :
  showmap
  gameplayer -add playerName -remove playerName
  startgame
  exitgame
gameplayer -add rob -add rob
Player name rob already existing...try this alone again...
```

5. **Game Log implementation**

   As a part of observer pattern, for every command executed during application is being stored  in a log file with timestamp and the effect of each command.

```
2021-03-21T15:05:36.228  GamePhase: MapEditor Command: newq Status: No newq map exists
2021-03-21T15:05:59.469  GamePhase: MapEditor Command: newmap Status: Invalid Command
2021-03-21T15:06:30.881  GamePhase: MapEditor Command: "savemap fer" Status: fer map saved successfully
2021-03-21T15:19:49.299  GamePhase: MapEditor Command: show Status: Invalid Command
2021-03-21T15:19:59.798  GamePhase: MapEditor Command: "showmap canada" Status: canada map has loaded and displayed
2021-03-21T15:20:05.518  GamePhase: MapEditor Command: newma Status: No newma map exists
2021-03-21T15:20:13.616  GamePhase: MapEditor Command: "savemap der" Status: der map saved successfully
2021-03-21T15:20:39.608  GamePhase: MapEditor Command: "editmap canada" Status: canada map editing has started
2021-03-21T15:20:51.398  GamePhase: MapEditor Command: editcontinent -add 3 3  Status: 3 addedContinent is already present"
2021-03-21T15:22:23.266  GamePhase: MapEditor Command: "editmap canada" Status: canada map editing has started
2021-03-21T15:22:34.359  GamePhase: MapEditor Command: editcontinent -add 7 4  Status: 7 addedContinent addedd successfully
2021-03-21T15:23:01.255  GamePhase: MapEditor Command: "editmap canads" Status: canads map editing has started
2021-03-21T15:23:01.261  GamePhase: MapEditor Command: "editmap canads" Status: No canads map exists, Please create one
2021-03-21T15:23:25.196  GamePhase: MapEditor Command: "editmap canada" Status: canada map editing has started
```