

**Exercise 8 (10 points)** – can be done in pair or individually

- The first lines of all source files must be comments containing names & IDs of all members. Also create file `readme.txt` containing names & IDs of all members
- Put all files (source, input, `readme.txt`) in folder `Ex8_xxx` where `xxx` = ID of the **group representative**, i.e. your source files must be in package `Ex8_xxx` (assumedly in Maven's `src/main/java`). Input files must be read from this path
- The group representative zips `Ex8_xxx` & submits it to Google Classroom. The other members submit only `readme.txt`. Email submission is not accepted

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1. Complete classes `FlagFeatureMap`. Modify it as needed, but don't change the visibility of the given members.

```
class FlagFeatureMap {
    // Key = feature, Value = set of countries
    private TreeMap<String, LinkedHashSet<String>> workingMap;
    private LinkedHashSet<String> allCountries;

    public void includeCountries(ArrayList<String> wantedFeatures) {
        // Get set of countries using each wanted feature as a key
        // Use set operations to include countries whose flags have wanted features
    }

    public void excludeCountries(ArrayList<String> unwantedFeatures) {
        // Get set of countries using each unwanted feature as a key
        // Use set operations to exclude countries whose flags have unwanted features
    }
}
```

2. Write a main class to do the following:

2.1 Read data from `flags.txt` into `workingMap` and `allCountries`. Each input line consists of country name, followed by flag features (color, stars, crescent, sun)

<u>flags.txt</u>	
Thailand,	red, white, blue
Armenia,	red, blue, orange
Azerbaijan,	light_blue, red, green, white, stars, crescent
Bhutan,	orange, red, white
Malaysia,	red, white, blue, stars, crescent

2.2 Print the content of `workingMap`

2.3 Ask user for wanted and unwanted flag features. Call `FlagFeatureMap`'s methods to:

- List all countries whose flags have wanted features
- Remove countries whose flags have unwanted features. List remaining countries
- Features not existing as keys in `workingMap` are ignored. You may need to check this before applying set operations to avoid runtime exception

2.4 Program must be able to loop for new queries from user

```

--- exec-maven-plugin:3.0.0:exec (default-cli) @ javasolutions ---
Total countries = 40
Total features = 11

    black >> Bahamas      Ghana      Guyana      Jamaica      Libya      South Africa      Sudan
              Tanzania      Zambia

    blue >> Armenia      Colombia      Costa Rica      Cuba      Ethiopia      Israel      Laos
           Malaysia      Mauritius      Namibia      Philippines      South Africa      Thailand      Tuvalu
           Ukraine      United Kingdom      United States      Uruguay      Venezuela

    crescent >> Algeria      Azerbaijan      Libya      Malaysia      Tunisia

    green >> Algeria      Azerbaijan      Cameroon      Ethiopia      Gabon      Ghana      Guyana
            Ireland      Jamaica      Libya      Lithuania      Mauritius      Namibia      Niger
            South Africa      Sudan      Tanzania      Zambia

light_blue >> Argentina      Azerbaijan      Bahamas      Gabon      Luxembourg      Tanzania      Tuvalu

    orange >> Armenia      Bhutan      Ireland      Lithuania      Niger      Zambia

    red >> Algeria      Armenia      Azerbaijan      Bhutan      Cameroon      Colombia      Costa Rica
          Cuba      Ethiopia      Ghana      Guyana      Japan      Laos      Libya
          Lithuania      Luxembourg      Malaysia      Mauritius      Namibia      Philippines      South Africa
          Sudan      Thailand      Tunisia      Tuvalu      United Kingdom      United States      Venezuela
          Vietnam      Zambia

    stars >> Algeria      Azerbaijan      Cameroon      Cuba      Ethiopia      Ghana      Israel
            Libya      Malaysia      Philippines      Tunisia      Tuvalu      United States      Venezuela
            Vietnam

    sun >> Argentina      Namibia      Philippines      Uruguay

    white >> Algeria      Argentina      Azerbaijan      Bhutan      Costa Rica      Cuba      Guyana
            Ireland      Israel      Japan      Laos      Libya      Luxembourg      Malaysia
            Namibia      Niger      Philippines      South Africa      Sudan      Thailand      Tunisia
            Tuvalu      United Kingdom      United States      Uruguay      Venezuela

    yellow >> Argentina      Bahamas      Cameroon      Colombia      Ethiopia      Gabon      Ghana
              Guyana      Jamaica      Mauritius      Namibia      Philippines      South Africa      Tanzania
              Tuvalu      Ukraine      Uruguay      Venezuela      Vietnam

=====
Enter features with prefix + or - (wanted or unwanted), separated by comma =
+light_blue, -sun, +purple

Ignore purple

Country flags with light_blue

+light_blue
    Argentina      Azerbaijan      Bahamas      Gabon      Luxembourg      Tanzania      Tuvalu

+light_blue BUT -sun
    Azerbaijan      Bahamas      Gabon      Luxembourg      Tanzania      Tuvalu

Enter Y/y to continue =
y
Country flags with light_blue & without sun (Argentina is excluded)

=====
Enter features with prefix + or - (wanted or unwanted), separated by comma =
+red

+red
    Algeria      Armenia      Azerbaijan      Bhutan      Cameroon      Colombia      Costa Rica
    Cuba      Ethiopia      Ghana      Guyana      Japan      Laos      Libya
    Lithuania      Luxembourg      Malaysia      Mauritius      Namibia      Philippines      South Africa
    Sudan      Thailand      Tunisia      Tuvalu      United Kingdom      United States      Venezuela
    Vietnam      Zambia

+red BUT {}
    Algeria      Armenia      Azerbaijan      Bhutan      Cameroon      Colombia      Costa Rica
    Cuba      Ethiopia      Ghana      Guyana      Japan      Laos      Libya
    Lithuania      Luxembourg      Malaysia      Mauritius      Namibia      Philippines      South Africa
    Sudan      Thailand      Tunisia      Tuvalu      United Kingdom      United States      Venezuela
    Vietnam      Zambia

```

Enter Y/y to continue =

Y

Enter features with prefix + or - (wanted or unwanted), separated by comma =

-red

{ } All 40 country flags

Algeria	Argentina	Armenia	Azerbaijan	Bahamas	Bhutan	Cameroon
Colombia	Costa Rica	Cuba	Ethiopia	Gabon	Ghana	Guyana
Ireland	Israel	Jamaica	Japan	Laos	Libya	Lithuania
Luxembourg	Malaysia	Mauritius	Namibia	Niger	Philippines	South Africa
Sudan	Tanzania	Thailand	Tunisia	Tuvalu	Ukraine	United Kingdom
United States	Uruguay	Venezuela	Vietnam	Zambia		

{ } BUT -red

Argentina	Bahamas	Gabon	Ireland	Israel	Jamaica	Niger
Tanzania	Ukraine	Uruguay				

Enter Y/y to continue = Only 10 of them don't have red color

Y

Enter features with prefix + or - (wanted or unwanted), separated by comma =

-crescent, +red, +stars

+red +stars

Algeria	Azerbaijan	Cameroon	Cuba	Ethiopia	Ghana	Libya
Malaysia	Philippines	Tunisia	Tuvalu	United States	Venezuela	Vietnam

+red +stars BUT -crescent

Cameroon	Cuba	Ethiopia	Ghana	Philippines	Tuvalu	United States
Venezuela	Vietnam					

Enter Y/y to continue =

Y

Enter features with prefix + or - (wanted or unwanted), separated by comma =

red, green, blue Ignore all (no + or -)

{ }

Algeria	Argentina	Armenia	Azerbaijan	Bahamas	Bhutan	Cameroon
Colombia	Costa Rica	Cuba	Ethiopia	Gabon	Ghana	Guyana
Ireland	Israel	Jamaica	Japan	Laos	Libya	Lithuania
Luxembourg	Malaysia	Mauritius	Namibia	Niger	Philippines	South Africa
Sudan	Tanzania	Thailand	Tunisia	Tuvalu	Ukraine	United Kingdom
United States	Uruguay	Venezuela	Vietnam	Zambia		

{ } BUT { }

Algeria	Argentina	Armenia	Azerbaijan	Bahamas	Bhutan	Cameroon
Colombia	Costa Rica	Cuba	Ethiopia	Gabon	Ghana	Guyana
Ireland	Israel	Jamaica	Japan	Laos	Libya	Lithuania
Luxembourg	Malaysia	Mauritius	Namibia	Niger	Philippines	South Africa
Sudan	Tanzania	Thailand	Tunisia	Tuvalu	Ukraine	United Kingdom
United States	Uruguay	Venezuela	Vietnam	Zambia		