# Constraint Satisfaction Problems

**Lab 6**

# Exercise 1

Use the following pseudocode to complete the program `constraints_template.py`.

Implement the recusive_backtrack function

Remember to **incorporate the other methods** already present in the file.

```
function RECURSIVE-BACKTRACKING(assignment, csp)
    if assignment is complete then return assignment
    var ← SELECT-UNASSIGNED-VARIABLE(VARIABLES[csp], assignment, csp)
    for each value in ORDER-DOMAIN-VALUES(var, assignment, csp)
        if value is consistent with assignment given CONSTRAINTS[csp]
            add {var = value} to assignment
            result ← RECURSIVE-BACKTRACKING(assignment, csp)
            if result ≠ failure then return result
            remove {var = value} from assignment
    return failure
```

# Exercise 2

Copy and modify the program from the exercise to use:

→ The map of South America (on the next slide)

→ 4 colors (red, green, blue and yellow


Costa Rica
Panamá
Venezuela
Guyana
Suriname
Guyane (Fr)
Colombia
Ecuador
Perú
Brasil
Bolivia
Paraguay
Uruguay
Chile
Argentina
1000 km
600 mi
© d-maps.com

# Challenge

**Optional**

Implement forward checking and arc consistency for the previous exercise.