Exercise: Python Constraint Satisfaction Problem

To be submitted

Use the following pseudocode to complete the attached file contraints_template.py, 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: Python Constraint Satisfaction Problem solution

Not to be submitted

See the attached file constraints.py, it contains a Python program to solve constraint satisfaction problems

1. What is returned by create_australia_csp()?
2. What is returned by backtracking_search()?
3. What is the purpose of assignment variable?
4. What is the purpose of variable variable?
5. What is the purpose of the following statement?

```
for value in self.order_domain_values(variable, assignment)
```

6. What would the following do?

```
if self.is_consistent('Q', 'Red', 'NT': 'Blue', 'NSW': 'green'):
        assignment[variable] = value
```

7. What would then assignment be?
8. What is the effect of del assignment[variable]?

Homework

To be submitted

Modify the program from the exercise to use:

- The map of South America on the last slide
- 4 colors (red, green, blue and yellow)

Challenge (**optional**)

Implement forward checking and arc consistency for the previous exercise


Costa Rica
Panamá
Venezuela
Guyana
Suriname
Guyane (Fr)
Colombia
Ecuador
Perú
Brasil
Bolivia
Paraguay
Uruguay
Chile
Argentina
1000 km
600 mi
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