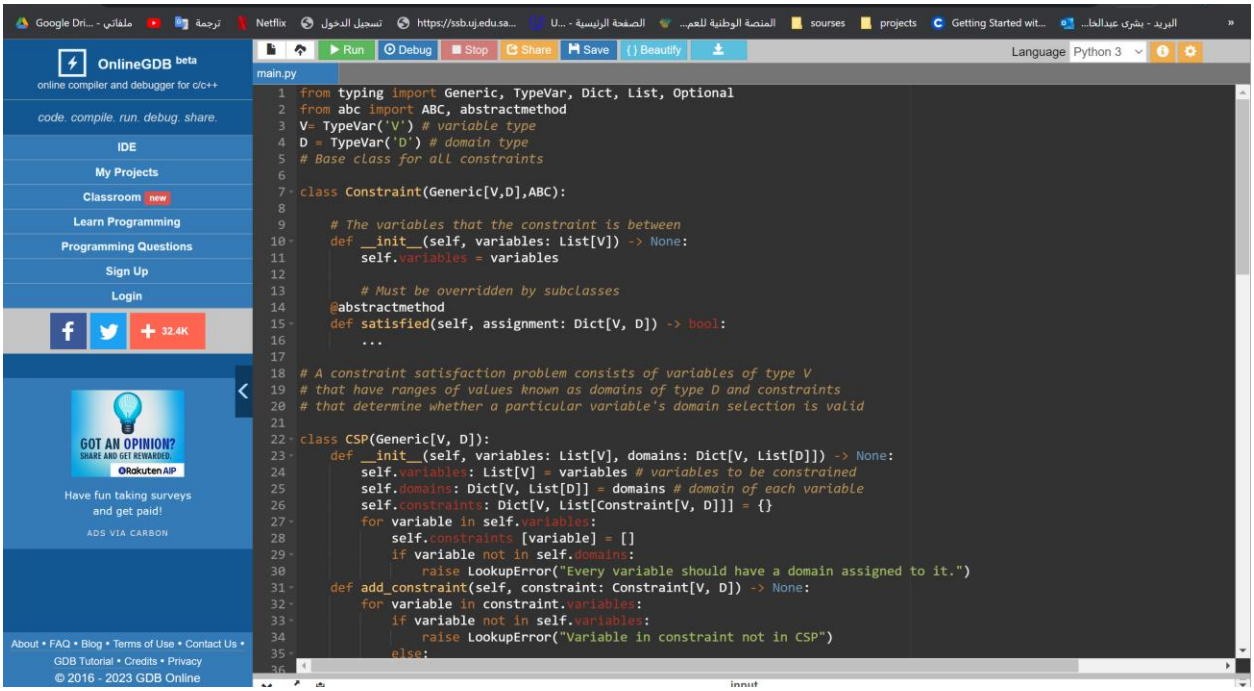
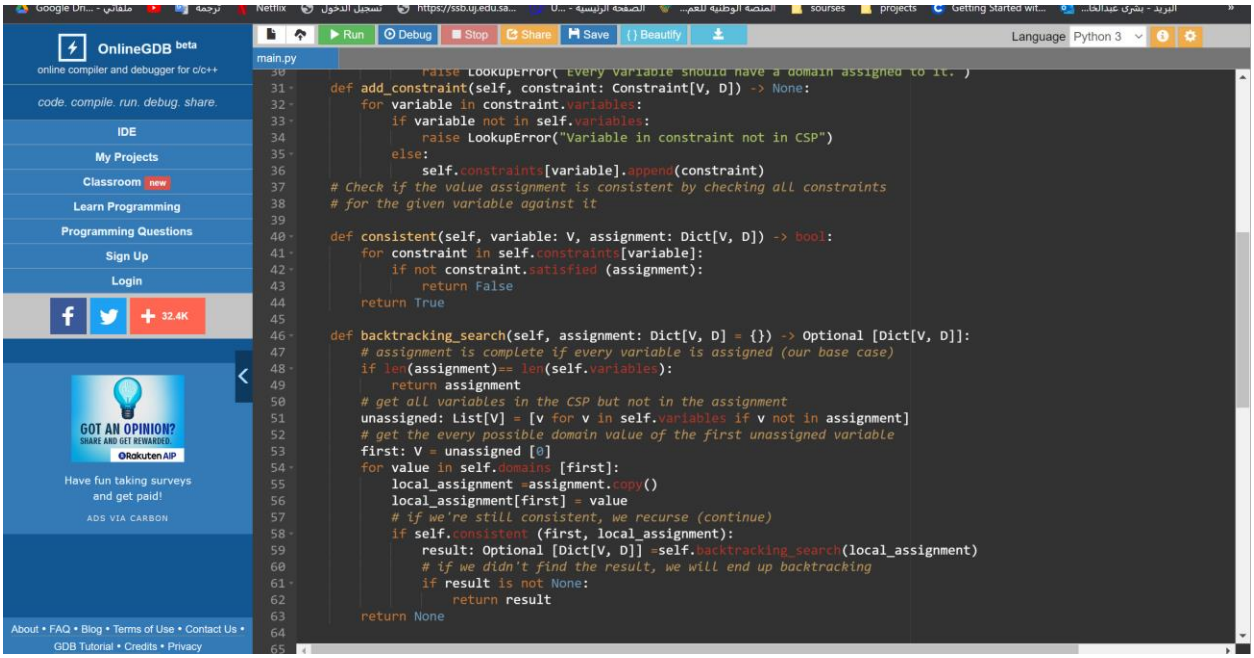
Lab8

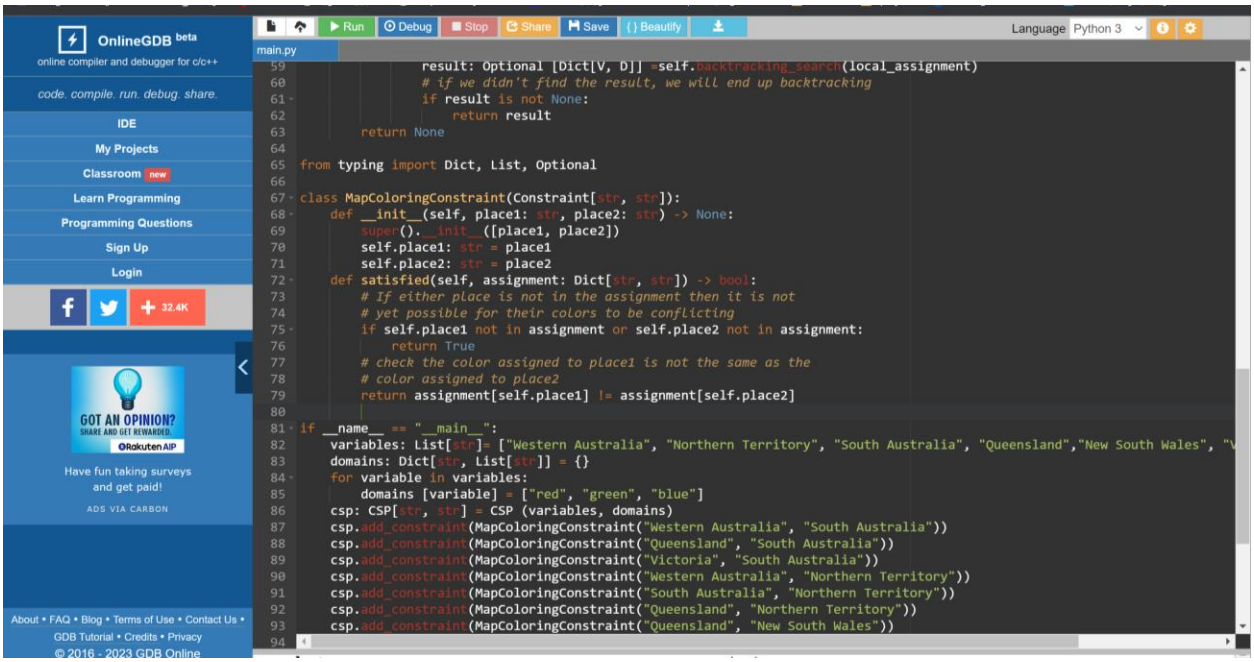
Bushra dajam

2110054

Code:



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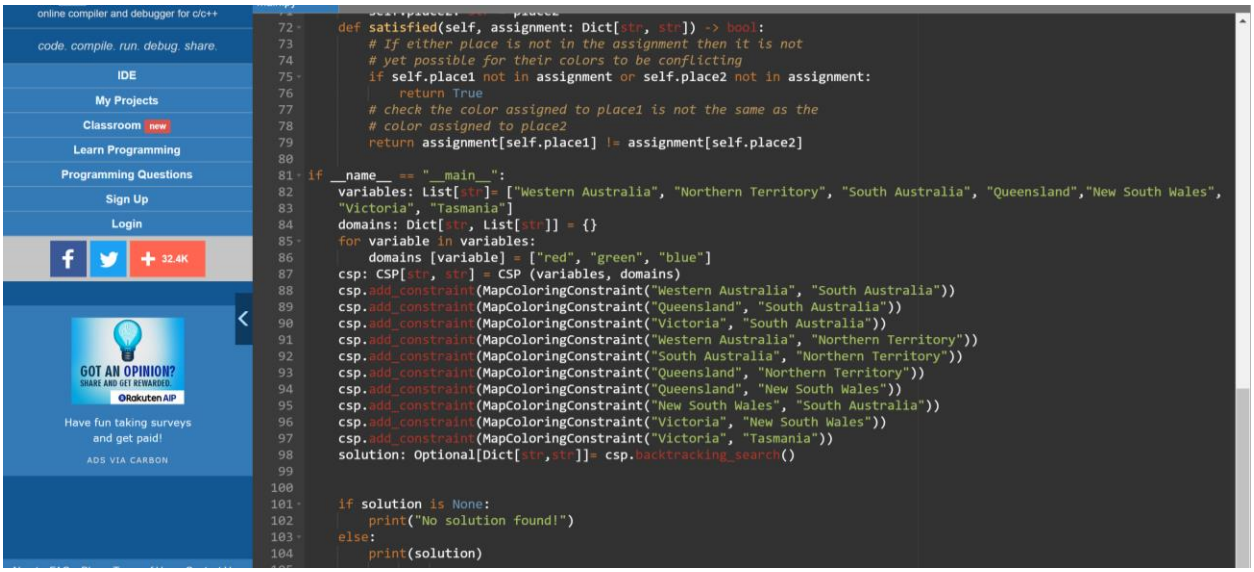
Language
Python 3
main.py
result: Optional [Dict[V, D]] =self.backtracking_search(local_assignment)
# if we didn't find the result, we will end up backtracking
if result is not None:
return result
return None
from typing import Dict, List, Optional
class MapColoringConstraint(Constraint[str, str]):
def __init__(self, place1: str, place2: str) -> None:
super().__init__([place1, place2])
self.place1: str = place1
self.place2: str = place2
def satisfied(self, assignment: Dict[str, str]) -> bool:
# If either place is not in the assignment then it is not
# yet possible for their colors to be conflicting
if self.place1 not in assignment or self.place2 not in assignment:
return True
check the color assigned to place1 is not the same as the
color assigned to place2
return assignment[self.place1] != assignment[self.place2]
if __name__ == "__main__":
variables: List[str]= ["Western Australia", "Northern Territory", "South Australia", "Queensland","New South Wales", "V
domains: Dict[str, List[str]] = {}
for variable in variables:
domains [variable] = ["red", "green", "blue"]
csp: CSP[str, str] = CSP (variables, domains)
csp.add_constraint(MapColoringConstraint("Western Australia", "South Australia"))
csp.add_constraint(MapColoringConstraint("Queensland", "South Australia"))
csp.add_constraint(MapColoringConstraint("Victoria", "South Australia"))
csp.add_constraint(MapColoringConstraint("Western Australia", "Northern Territory"))
csp.add_constraint(MapColoringConstraint("South Australia", "Northern Territory"))
csp.add_constraint(MapColoringConstraint("Queensland", "Northern Territory"))
csp.add_constraint(MapColoringConstraint("Queensland", "New South Wales"))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def satisfied(self, assignment: Dict[str, str]) -> bool:
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if self.place1 not in assignment or self.place2 not in assignment:
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check the color assigned to place1 is not the same as the
color assigned to place2
return assignment[self.place1] != assignment[self.place2]
if __name__ == "__main__":
variables: List[str]= ["Western Australia", "Northern Territory", "South Australia", "Queensland","New South Wales",
"Victoria", "Tasmania"]
domains: Dict[str, List[str]] = {}
for variable in variables:
domains [variable] = ["red", "green", "blue"]
csp: CSP[str, str] = CSP (variables, domains)
csp.add_constraint(MapColoringConstraint("Western Australia", "South Australia"))
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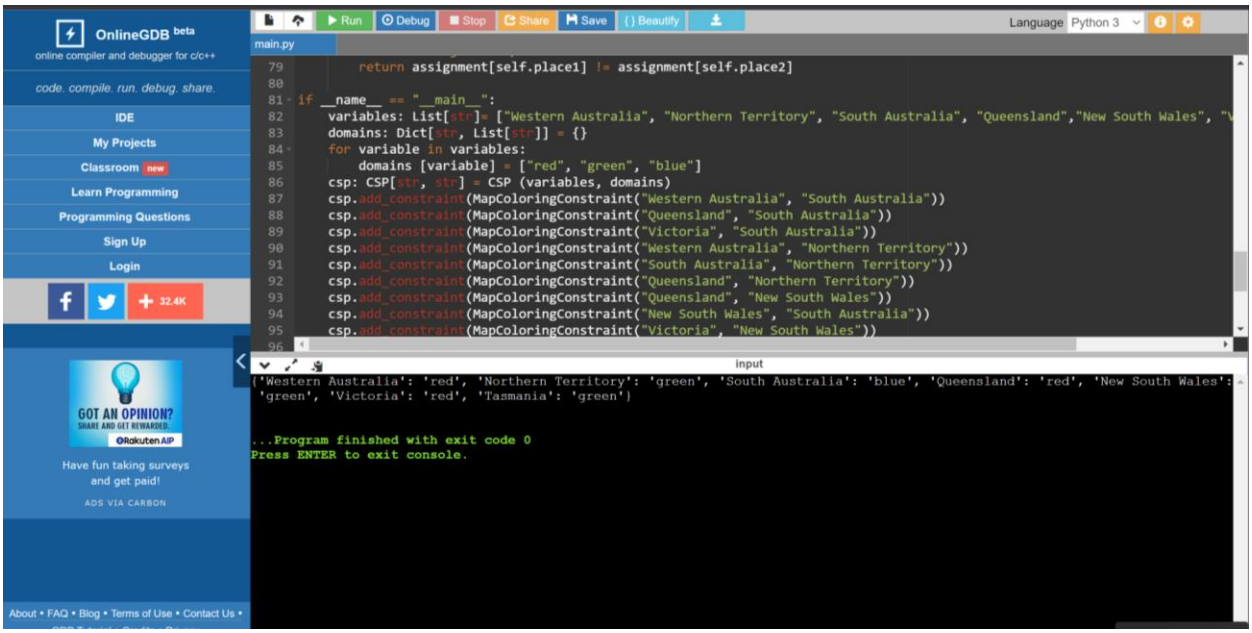
csp.add_constraint(MapColoringConstraint("Western Australia", "Northern Territory"))
csp.add_constraint(MapColoringConstraint("South Australia", "Northern Territory"))
csp.add_constraint(MapColoringConstraint("Queensland", "Northern Territory"))
csp.add_constraint(MapColoringConstraint("Queensland", "New South Wales"))
csp.add_constraint(MapColoringConstraint("New South Wales", "South Australia"))
csp.add_constraint(MapColoringConstraint("Victoria", "New South Wales"))
csp.add_constraint(MapColoringConstraint("Victoria", "Tasmania"))
solution: Optional[Dict[str,str]]= csp.backtracking_search()
if solution is None:
print("No solution found!")
else:
print(solution)

Output: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Language
Python 3
main.py
return assignment[self.place1] != assignment[self.place2]
if __name__ == "__main__":
variables: List[str]= ["Western Australia", "Northern Territory", "South Australia", "Queensland","New South Wales", "
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csp.add_constraint(MapColoringConstraint("Western Australia", "Northern Territory"))
csp.add_constraint(MapColoringConstraint("South Australia", "Northern Territory"))
csp.add_constraint(MapColoringConstraint("Queensland", "Northern Territory"))
csp.add_constraint(MapColoringConstraint("Queensland", "New South Wales"))
csp.add_constraint(MapColoringConstraint("New South Wales", "South Australia"))
csp.add_constraint(MapColoringConstraint("Victoria", "New South Wales"))
input
{'Western Australia': 'red', 'Northern Territory': 'green', 'South Australia': 'blue', 'Queensland': 'red', 'New South Wales':
'green', 'Victoria': 'red', 'Tasmania': 'green'}
...Program finished with exit code 0
Press ENTER to exit console.