

MP-1 PRACTICAL-3**1. Develop a python program to demonstrate the Duality in Linear Programming****QUESTION:**Minimize : $C=21x_1 + 50x_2$

Subject To:

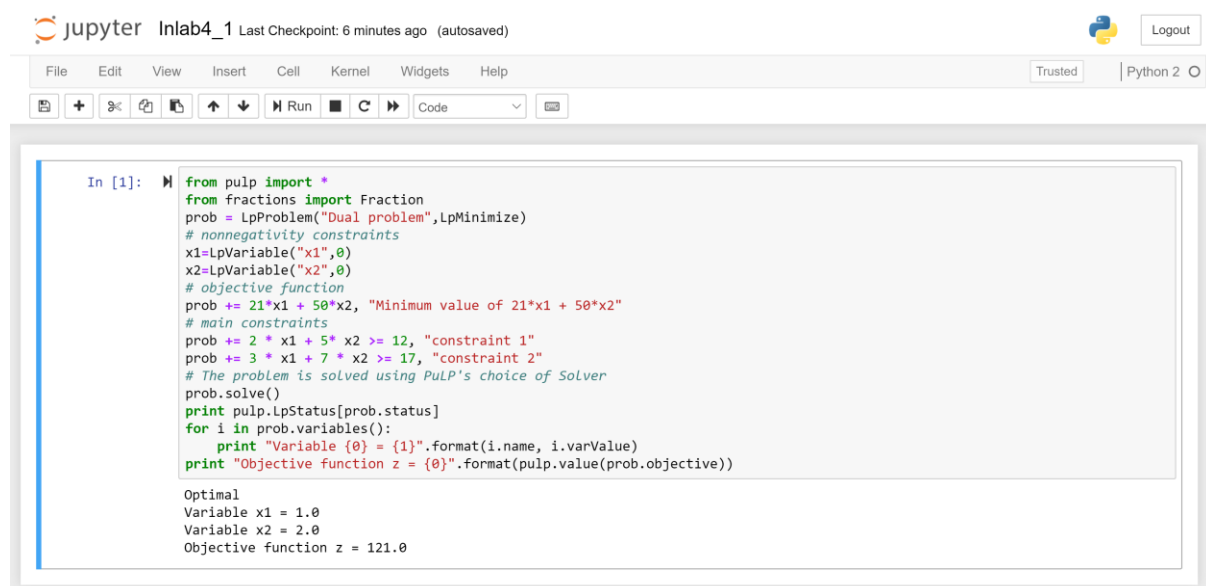
$$2x_1 + 5x_2 \geq 12$$

$$3x_1 + 7x_2 \geq 17$$

$$x_1, x_2 \geq 0$$

Code:

```
from pulp import *
from fractions import Fraction
prob = LpProblem("Dual problem", LpMinimize)
# nonnegativity constraints
x1=LpVariable("x1",0)
x2=LpVariable("x2",0)
# objective function
prob += 21*x1 + 50*x2, "Minimum value of 21*x1 + 50*x2"
# main constraints
prob += 2 * x1 + 5 * x2 >= 12, "constraint 1"
prob += 3 * x1 + 7 * x2 >= 17, "constraint 2"
# The problem is solved using PuLP's choice of Solver
prob.solve()
print pulp.LpStatus[prob.status]
for i in prob.variables():
    print "Variable {0} = {1}".format(i.name, i.varValue)
print "Objective function z = {0}".format(pulp.value(prob.objective))
```



Jupyter Inlab4_1 Last Checkpoint: 6 minutes ago (autosaved) Trusted Python 2

```
In [1]: from pulp import *
from fractions import Fraction
prob = LpProblem("Dual problem", LpMinimize)
# nonnegativity constraints
x1=LpVariable("x1",0)
x2=LpVariable("x2",0)
# objective function
prob += 21*x1 + 50*x2, "Minimum value of 21*x1 + 50*x2"
# main constraints
prob += 2 * x1 + 5 * x2 >= 12, "constraint 1"
prob += 3 * x1 + 7 * x2 >= 17, "constraint 2"
# The problem is solved using PuLP's choice of Solver
prob.solve()
print pulp.LpStatus[prob.status]
for i in prob.variables():
    print "Variable {0} = {1}".format(i.name, i.varValue)
print "Objective function z = {0}".format(pulp.value(prob.objective))

Optimal
Variable x1 = 1.0
Variable x2 = 2.0
Objective function z = 121.0
```