

```
In [1]: import pandas as pd
import numpy as np
from pulp import *
```

```
In [2]: prob=LpProblem('minimization problem',LpMinimize)
```

C:\Users\Lenovo\AppData\Local\Programs\Python\Python311\Lib\site-packages\pulp\pulp.py:1316: UserWarning: Spaces are not permitted in the name. Converted to '_'
 warnings.warn("Spaces are not permitted in the name. Converted to '_")

```
In [3]: x12=LpVariable('x12',0)
x13=LpVariable('x13',0)
x24=LpVariable('x24',0)
x23=LpVariable('x23',0)
x35=LpVariable('x35',0)
x36=LpVariable('x36',0)
x46=LpVariable('x46',0)
x47=LpVariable('x47',0)
x56=LpVariable('x56',0)
x59=LpVariable('x59',0)
x69=LpVariable('x69',0)
x68=LpVariable('x68',0)
x78=LpVariable('x78',0)
x710=LpVariable('x710',0)
x89=LpVariable('x89',0)
x810=LpVariable('x810',0)
x911=LpVariable('x911',0)
x1011=LpVariable('x1011',0)
```

```
In [5]: prob+=2.5*x12+3*x13+2.5*x24+1.7*x23+1.7*x35+2.8*x36+2*x46+1.5*x47+2*x56+5*x59+4.7*x69+3*x68+1.5*x78+2.3*x710+2*x89+1.1*x810+3.3*x
```

```
In [6]: prob+=-x13-x12== -1
prob+=x12-x23-x24==0
prob+=x13+x23-x35-x36==0
prob+=x24-x46-x47==0
prob+=x35-x56-x59==0
prob+=x36+x46+x56-x68-x69==0
prob+=x47-x78-x710==0
prob+=x68+x78-x89-x810==0
prob+=x59+x69+x89-x911==0
prob+=x810+x710-x1011==0
prob+=x911+x1011==1
```

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In [7]: prob.solve()
```

```
Out[7]: 1
```

```
In [8]: for v in prob.variables():
print(v.name,v.varValue)
```

```
x1011 1.0
x12 1.0
x13 0.0
x23 0.0
x24 1.0
x35 0.0
x36 0.0
x46 0.0
x47 1.0
x56 0.0
x59 0.0
x68 -0.0
x69 0.0
x710 1.0
x78 0.0
x810 -0.0
x89 0.0
x911 0.0
```

```
In [9]: print(value(prob.objective))
```

```
11.5
```

```
In [ ]:
```

