

例 2.3 线性规划问题

修改参数: c:目标函数系数

A_ub, B_ub:不等式约束系数

A_eq, B_eq:等式约束系数

bounds:变量约束范围

"""

```
import numpy as np
from scipy import optimize as op
import matplotlib.pyplot as plt

x = np.linspace(0.0, 8, 100)
y1 = (60 - 10 * x) / 6
y2 = (40 - 7 * x) / 3
y3 = (60 - 10 * x) / 5
y4 = (35 - 5 * x) / 6

plt.plot(x, y1, label=r'$10x_1+6x_2=60$')
plt.plot(x, y2, label=r'$7x_1+3x_2=40$')
plt.plot(x, y3, label=r'$10x_1+5x_2=60$')
plt.plot(x, y4, label=r'$5x_1+4x_2=35$')

plt.xlim((0.0, 8.0))
plt.ylim((0.0, 12.0))
plt.xlabel(r'$x_1$')
plt.ylabel(r'$x_2$')

y6 = np.maximum(y2, y3, y4)
plt.fill_between(x, y1, y6, where=y1 > y6, color='grey', alpha=0.5)

plt.grid(True, linestyle='-.')
plt.legend(bbox_to_anchor=(1.05, 1), loc=2, borderaxespad=0.)

plt.show()

def LP_minimize():
    res = op.linprog(c, A_ub, B_ub, A_eq, B_eq, bounds=(x1, x2))
    print(res.x)
    print(res.fun)

if __name__ == '__main__':
    c = np.array([0, 0])
```

```
A_ub = np.array([[10, 6],
                 [-7, -3],
                 [-10, -5],
                 [-5, -4]
                 ])
B_ub = np.array([60, 40, 60, 35])
A_eq = None
B_eq = None
x1 = (0, None)
x2 = (0, None)
LP_minimize()
```