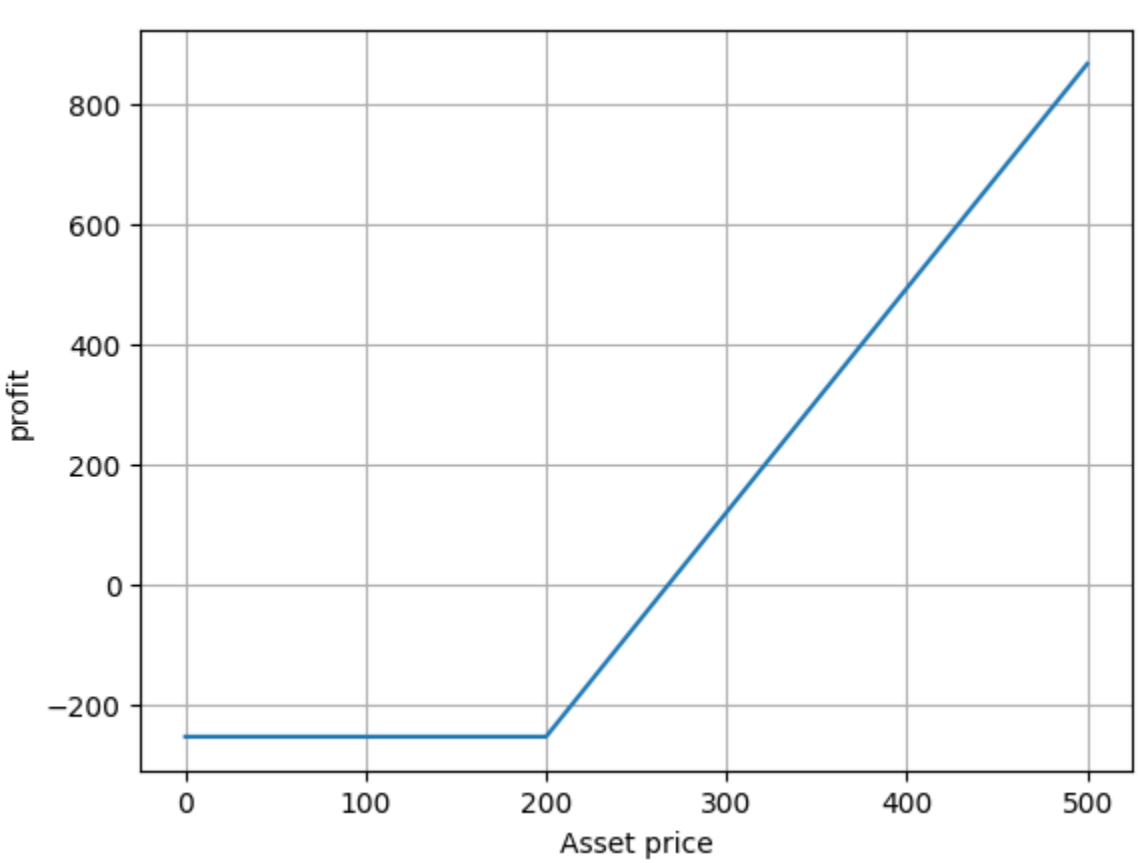
```
import numpy as np
from matplotlib import pyplot as plt
def profit(x, coeffs):
    a = coeffs[0]
    b = coeffs[1]
    c = coeffs[2]
    return a*x + b*np.maximum(np.zeros_like(x),x-230) + c*np.maximum(np.zeros_like(x),200-x) - 100
```

```
from scipy.optimize import linprog

# Objective function: minimize x4 (we represent it by the last variable in the list)
obj = [0, 0, 0, 1]  # Only x4 has a coefficient of 1, the rest are 0

# Inequality constraints in the form Ax ≤ b

A = [
    [0, 0, -200, -1],    # 200 * x3 + x4 ≥ 1000
    [-200, 0, 0, -1],    # 200 * x1 + x4 ≥ 1000
    [-230, 0, 0, -1],    # 230 * x1 + x4 ≥ 1000
    [-1, -1, 0, 0]       # x1 + x2 ≥ 0
]
b = [-1000, -1000, -1000, 0]

# Equality constraint for Ax = b
# 238 * x1 + 65 * x2 + 30 * x3 = 1000
A_eq = [[238, 65, 30, 0]]
b_eq = [1000]

# Bounds for x1, x2, x3, x4 (all variables ≥ 0)
x_bounds = [(0, float('inf')), (0, float('inf')), (0, float('inf')), (0, float('inf'))]

# Solving the problem
result = linprog(c=obj, A_ub=A, b_ub=b, A_eq=A_eq, b_eq=b_eq, bounds=x_bounds)

# Display the result
print("Optimal value:", result.fun)
print("Optimal solution:", result.x)
print("Status:", result.message)
```

```
Optimal value: 253.7313432835822
Optimal solution: [  3.73134328   0.           3.73134328 253.73134328]
Status: Optimization terminated successfully. (HiGHS Status 7: Optimal)
```

```
x = np.linspace(0,500,1024)
profit1 = profit(x, result.x)
plt.plot(x,profit1)
plt.grid()
plt.xlabel('Asset price')
```

```
plt.ylabel('profit')
plt.show()
```




```
from scipy.optimize import linprog

# Objective function: minimize x4 (we represent it by the last variable in the list)
obj = [0, 0, 0, 1]  # Only x4 has a coefficient of 1, the rest are 0

# Inequality constraints in the form Ax ≤ b

A = [
    [0, 0, -200, -1],    # 200 * x3 + x4 ≥ 1000
    [-200, 0, 0, -1],    # 200 * x1 + x4 ≥ 1000
    [-230, 0, 0, -1],    # 230 * x1 + x4 ≥ 1000
    [-1, -1, 0, 0]       # x1 + x2 ≥ 0
]
b = [-1000, -1000, -1000, 0]

# Equality constraint for Ax = b
# 238 * x1 + 65 * x2 + 30 * x3 = 1000
A_eq = [[238, 65, 30, 0]]
b_eq = [1000]

# Bounds for x1, x2, x3, x4
x_bounds = [(-float('inf'), float('inf')), (-float('inf'), float('inf')), (-float('inf'), float('i
```

```
# Solving the problem
result = linprog(c=obj, A_ub=A, b_ub=b, A_eq=A_eq, b_eq=b_eq, bounds=x_bounds)

# Display the result
print("Optimal value:", result.fun)
print("Optimal solution:", result.x)
print("Status:", result.message)
```

```
Optimal value: 14.77832512315273
Optimal solution: [ 4.92610837 -4.92610837  4.92610837 14.77832512]
Status: Optimization terminated successfully. (HiGHS Status 7: Optimal)
```

```
x = np.linspace(0,500,1024)
profit1 = profit(x, result.x)
plt.plot(x,profit1)
plt.grid()
plt.xlabel('Asset price')
plt.ylabel('profit')
plt.show()
```