Brief Explanation of the Code

This code solves an **equality-constrained optimization problem** using **Lagrange multipliers**.

Libraries Used:

- **NumPy (numpy)** – Imported but not used in this code.
- **SymPy (sympy)** – Used for symbolic differentiation and equation solving.
- **SciPy (scipy.optimize)** – Imported but not used in this code.

How It Works:

1. **Extracts variables (x)** from the objective function `f`.
2. **Defines Lagrange multipliers (lambda)** for the constraints.
3. **Constructs the Lagrangian (L)** by adding constraint terms to `f`.
4. **Computes KKT equations** (gradients of `L`) and adds the constraints.
5. **Solves the system of equations** using `sp.solve()`.

Example Use Case:

Minimizes $f(x, y) = x^2 + y^2$ subject to $x + y - 1 = 0$. The function returns the optimal values of x, y, and the Lagrange multiplier λ.

Results:

Solution to equality-constrained problem: [{lambda0: -1, x: 1/2, y: 1/2}]