ASSIGNMENT-OPTIMIZATION

Contents

1 Problem

A solution of 8% Boric acid is to be diluted by adding a 2% Boric acid solution to it.The resulting mixture is to be more than 4% but less than 6% Boric acid. If we have 640 liters of the 8% solution,how many liters of the 2% solution will have to added ?

2 Solution

1.Consider total amount to be (x+640)liters from the given information

$$2\%of x + 8\%of 640 > 4\%of(x + 640) \quad (1)$$
$$2\%of x + 8\%of 640 < 6\%of(x + 640) \quad (2)$$

2.From equation 1 we can solve and get the maximum of x

$$\frac{2x}{100} + \frac{8X640}{100} > \frac{4}{100}(x + 640)$$
$$2x + 5120 > 4x + 2560$$
$$2560 > 2x$$
$$x < 1280$$

3. From equation 2 we can solve and get the minimum of x

$$\frac{2x}{100} + \frac{8X640}{100} > \frac{6}{100}(x + 640)$$
$$2x + 5120 < 6x + 3840$$
$$1280 < 4x$$
$$320 < x$$

The x lies in between 320 and 1280.

The python code provided in the below source code link.

https://github.com/sivagayathri/FWC/blob/main/opt/opt-1.py