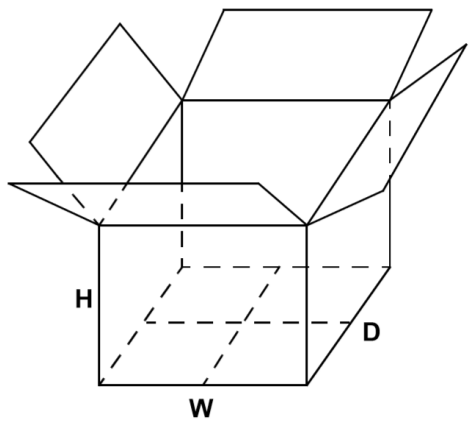
HW 08 - turn in one week from today in Canvas

Turn in the 2 questions as a single .py file onto canvas. Use comments to clearly indicate which question you are working on. Your filename should end as _py2.py if you use Python2 and _py3.py if you use Python3.

1. Box design: Determine H, W, D to minimize the carton surface area required to enclose a volume of at least 2 cubic feet. The box is as follows:



   Use the SLSQP algorihtim to solve this problem. Print the values for H, W, D. Print the final surface area value, and print the final volume of the optimum box. (continued on next slide)

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1. Minimize:

$$S = 2.0(WH + DH + 2WD) \tag{1}$$

subject to

$$2.0 - HDW \leq 0.0 \tag{2}$$

with the following practical bounds on each variable

$$H, W, D \geq 0.0 \tag{3}$$

from an initial design of

$$x_0 = [1.0, 1.0, 1.0] \tag{4}$$

(This problem is from the DOT manual `http://www.vrand.com/`

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2. Minimize The Wood's function

$$f(\boldsymbol{x}) = 100(x_2 - x_1^2)^2 + (1 - x_1)^2 + 90(x_4 - x_3^2)^2 \tag{5}$$
$$+(1 - x_3)^2 + 10(x_2 + x_4 - 2)^2 + 0.1(x_2 - x_4)^2 \tag{6}$$

on the domain

$$-10 \leq x_1 \leq 10 \tag{7}$$
$$-10 \leq x_2 \leq 10 \tag{8}$$
$$-10 \leq x_3 \leq 10 \tag{9}$$
$$-10 \leq x_4 \leq 10 \tag{10}$$

print the values of x_1, x_2, x_3, x_4 at the minimum and print the optimum objective value.