Homework 3

Problem 1 (*4 points*) Swanson's Bakery is well known for producing the best fresh bread in the city supplying several grocery stores and restaurants, so the sales are very substantial. The daily demand for its fresh bread has the following distribution

Demand	Probability
50	.10
75	.15
100	.20
125	.20
150	.10
175	.25

The bread is baked in the early morning, before the bakery opens for business, at a cost of $4 per loaf. It then is sold that day for $5.5 per loaf. Any bread not sold on the day it is baked and relabeled as day-old bread and sold subsequently at a discount price of $2 per loaf. How many loaves should Swanson bake every day?

Problem 2 (*6 points*) You are traveling abroad and have only American dollars with you. You are currently in the country's capital but will soon head to a small town for an extended stay. In the town, no one takes credit cards and they only accept the domestic currency–shillings. In the capital, you can convert dollars to shillings at a rate of two shillings per dollars. In the town, a dollar only buys 1.6 shillings. Upon your return to the capital at the end of your trip, you can convert shillings back to dollars at a rate of 2.5 shillings per dollar. You estimate that your expenditures in the town will be normally distributed with mean of 400 shillings and standard deviation of 100 shillings.

How much shillings should you get before leaving the capital to minimize the expected loss due to currency exchange?

Problem 1:

$C_o = 4 - 2 = \$2$

$C_u = 5.5 - 4 = \$1.5$

100 Swanson bakes should be loaved by them each day.

Q	50	75	100	125	150	175
Expected gain of one more bread	1.5	1.125	0.825	0.525	0.375	0
Expected loss of one more bread	0.2	0.5	0.9	1.3	1.5	2
Bake one more	√	√	X	X	X	X

Problem 2:

1 shilling $= \frac{1}{2} = 0.5\$$, before leaving capital.

In town, 1 shilling $= 1/1.6 = \$0.625$

Back to capital. 1 shilling $= 1/2.5 = \$0.4$.

$C_o = 0.1$ $\quad C_u = 0.125$

$P = C_u / (C_u + C_o) = 0.125/0.225 = 0.5556$

$Q = 100 \times 2p + 400 = 414$.