Stat13 Homework 4

http://www.stat.ucla.edu/~dinov/courses_students.html

(30 points, student scores will be converted to scores out of 100)

Suggested Solutions

Problem 1

a) (6 points)

1) 0.0228
2) 0.0228
3) 0.8413
4) 0.2857
5) 0.2857
6) 0.7404

b) (2 points)

Let *least* denote the least amount needed. Then *least* satisfies: Pr(X<*least*)=90%

So, *least*=10.2404

The IQR is 9.4633-7.7367=1.7266

c)

i) (1 point)

0.152

ii) (1 point)

0.7788

iii) (1 point)

4.99

d)

i) (1 point for mean, 1 points for SD)

E(Y)=-24

SD(Y)=17.49

ii) (2 point)

----centered much lower than either X or W

----distribution is more spread out than X or W

Problem 2

i) (4 points)

z-score for the value:

-6: (-6-3)/4=-2.25.

hence 2.25 SD away from mean

10: similarly, (10-3)/4=1.75.

hence 1.75 SD away from mean

7: (7-3)/4=1.

hence 1 SD away from mean

-0.4: (-0.4-3)/4=-0.825.

hence 0.825 SD away from mean

ii) (2 points)

$\Pr(-2 \le X \le 0) = 0.121$

No difference. Because Pr(X=0)=Pr(X=-2)=0 for normal distribution. Hence no difference.

Problem 3. (9 points total, 3 for each)

i) $\Pr(73 \le Male \le 75) = 0.9522\text{-}0.8413 = 0.1109$

ii) $Male + Female \sim N(73 + 65.5, (\sqrt{3^2 + 2.5^2})^2$

Hence $\Pr(Male + Female \le 140) = 0.8754$

iii) $Male - Female \sim N(73 - 65.5, (\sqrt{3^2 + 2.5^2})^2$

Hence $\Pr(Female > Male) = \Pr(Male - Female < 0) = 0.1246$