HW3\_Group1\_Austin Halvorsen

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Sep 22 2020

# Problems

## Question 1

### (i)

Find the average monthly housing expenditure.

[1] 566

### (ii)

Find the median monthly housing expenditure.

[1] 505

### (iii)

If monthly housing expenditures were measured in hundreds of dollars, rather than in dollars, what would be the average and median expenditures?

[1] 5.66

[1] 5.05

The mean would be 5.66

The median would be 5.05

### (iv)

Suppose that family number 8 increases its monthly housing expenditure to $900, but the expenditures of all other families remain the same. Compute the average and median housing expenditures.

[1] 576

[1] 505

The mean would be 576.

The median would be 505.

## Question 2

Reconcile the shareholders and CEO’s disagreement:

[1] 0.2

The difference between the two percentages (18% - 15%) is 3%, however the percentage change between 15% and 18% is 20%. They are both correct, but looking at the problem from two different positions.

## Question 3

### (i)

What is salary when exper = 0? When exper = 5? (Hint: You will need to exponentiate.)

[1] 40134.84

[1] 45935.8

The salary at 0 years would be $40,134.84.

The salary at 5 years would be $45,935.80.

### (ii)

Use this equation: %∆y ≈ (100 ∗ β1)∆x to approximate the percentage increase in salary when exper increases by five years.

[1] 13.5

### (iii)

Use the results of part (i) to compute the exact percentage difference in salary when exper = 0 and When exper = 5. Comment on how this compares with the approximation in part (ii).

[1] 14.45368

The percent change is 14.5% from the part i. Based on our approximation from part ii, we had that after 5 years experience the percentage increase would be about 13.5%.

## Question 4

Let X be a random variable distributed as X ∼ Norm(5,4). Find the probabilities of the following events. Hint: E(X) = 5 and V ar(X) = 4

### (i)

P(X ≤ 6)

[1] 0.691

### (ii)

P(X > 4)

[1] 0.691

### (iii)

P(|X−5|>1)

[1] 0.617

## Question 5

### (i)

Find the probability that the elderly employment rate is at least 0.6 (i.e. 60%).

[1] 0.352

## Question 6

### (i)

Find the mean and standard deviation when salary is measured in dollars.

[1] 52300

[1] 14600