Chapter 4 Quiz – Number 6

X=price of gas
The population of X is normal with μ = $2.75 and σ = $0.40
Question: If you take a random sample of 50 gas stations and calculate the sample mean price, what is the probability that the sample mean is between $2.60 and $2.90.

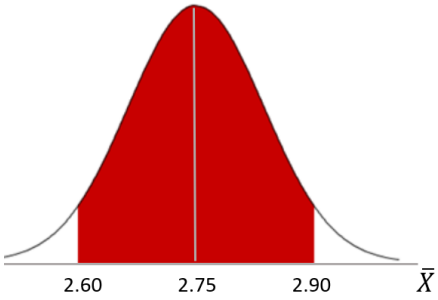
First: Describe the sampling distribution of the mean:

a. $\mu_{\bar{X}} = \mu = 2.75$

b. $\sigma_{\bar{X}} = \sigma/\sqrt{n} = 0.40/\sqrt{50} = 0.056569$

c. The shape of the sampling distribution is normal because the population shape is normal (regardless of sample size)

Second: Given the characteristics of the sampling distribution, shade the area represented by the probability:



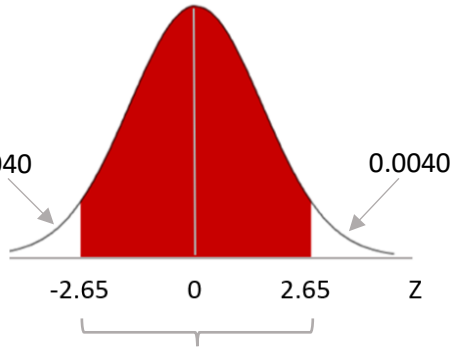
Third: Convert the sample means to Z-scores:

$$Z = \frac{\bar{X} - \mu_{\bar{X}}}{\sigma_{\bar{X}}} = \frac{2.60 - 2.75}{0.056569} = -2.65$$

$$Z = \frac{\bar{X} - \mu_{\bar{X}}}{\sigma_{\bar{X}}} = \frac{2.90 - 2.75}{0.056569} = +2.65$$

Third: Convert the sampling distribution to a Z-distribution and use the Z-table to find the probability:

From Z-table: 0.0040 0.0040



Answer = 0.9920

Chapter 5 Quiz – Number 6

In order to get the p-value for the chi-square test, the user must get the results of the chi-square test of independence on those 2 variables by running the following code (which is identical to the code used in Program 5.2 except the user should replace Corner with Fullbath_2plus):

```
libname sasba 'c:\sasba\ames';
    data ames;
    set sasba.ames300;
proc format;
   value Quality 0=No 1=Yes;
   value YesNo 0=No 1=Yes;
proc freq data=ames;
    tables Bonus*fullbath_2plus
    /chisq relrisk expected plots=freqplot(scale=percent);
    format Bonus fullbath_2plus YesNo.;
    title 'Test of Independence for Bonus and Fullbath_2plus';
run;
```

From the SAS output, the user can see that the chi-square test stat = 150.5152 with p-value which shows up as <.0001. Since the user doesn't have the exact p-value from the output, you can use an excel function, inserting the test stat and degrees of freedom, to get it:

=CHISQ.DIST.RT(150.5152,1) where 1=the degrees of freedom.

As a result, you get an p-value of 1.33767 x 10 to the -34 power.

Finally the WORTH = -2log(1.33767x10 to -34 power = 67.75 (which is answer A)

Chapter 8

The paragraph in Chapter 8, page 231 should read, “If a variable has a point on the plot that tends to fall below the trend of other points, indicating a relatively high rank for Hoeffding’s D and a relatively low rank for Spearman, there may be a non-monotonic relationship between the input variable and the target.”