Hw8 – Minitab – help

Question 1 –instructions included on the homework

Question 2 +

Ha: $\mu \neq 700$ at $\alpha=0.01$ (I will accept with z , but it is not correct way of doing – we introduced t-distribution)

STAT > BASIC STATISTICS> 1-Sample t > Summarized data (enter numbers)

Test mean :700 (value from Ho)

OPTIONS> Confidence level enter $1-\alpha=1-0.01=0.99$

Alternative : not equal (look at the sign of Ha)

Alternative Hypothesis Define the alternative hypothesis.

Less than: Choose to perform a lower-tailed test.

Not equal: Choose to perform two-tailed test.

Greater than: Choose to perform an upper-tailed test.

You will see the following output:

One-Sample T

```
Test of mu = 700 vs not = 700

 N     Mean    StDev  SE Mean         99% CI             T      P
64  689.000  40.000    5.000  (675.719, 702.281)  -2.20  0.031
```

To calculate the power of the test when ,$\mu=685$ and $\alpha=0.05$

Stat > Power and Sample Size > 1-Sample t

You can use to calculate one of the following for a one-sample t-test.:

• power • sample size • minimum difference (effect)

You need to determine what are acceptable values for any two of these parameters and Minitab will solve for the third. For example, if you specify values for power and the minimum difference, Minitab will determine the sample size required to detect the specified difference at the specified level of power. We will specify sample size and minimum difference to calculate power.

Specify values for any two of the following: Specify two values and Minitab will calculate the third.

In the main dialog box, you need to specify the minimum difference you are interested in detecting. The manner in which you express this difference depends on whether you are performing a one- or two-sample test:

• For a one-sample Z- or t-test, express the difference in terms of the null hypothesis.

For example, suppose you are testing whether or not your students' mean test score is different from the population mean. If you would like to detect a difference of three points, you would enter 3 in **Differences**.

For example, suppose you are investigating the effects of water acidity on the growth of two populations of tadpoles. If you are interested in differences of 4 mm or more, you would enter 4 in **Differences**.

If you choose **Less than** as your alternative hypothesis, then you must enter a negative value in **Differences**. If you choose **Greater than**, you must enter a positive value. This is because with a one-tailed test, you have no power to detect an effect in the opposite direction.

So for our problem you will enter Sample sizes :64

Differences : 15 (700 – 685=15)

Standard deviation :40

Options Alternative Hypothesis : not equal

Significance level 0.05

Power and Sample Size

```
1-Sample t Test

Testing mean = null (versus not = null)
Calculating power for mean = null + difference
Alpha = 0.05  Assumed standard deviation = 40


            Sample
Difference    Size     Power
        15      64  0.839891
```

If you want to test one proportion :

STAT > BASIC STATISTICS>1proportion

If you want to test the difference between 2 means: (if 0 is not included in C.I – no difference)

STAT > BASIC STATISTICS> 2 sample t

If you want to test the difference between 2 proportions :

STAT > BASIC STATISTICS>2proportions