

STAT 3309

EXCEL HW 2

Due: SAT, APR 15

A. Discrete Distribution-Continuous Distribution

A1. Find each of the following probabilities, **using EXCEL**,

- a** $P(0 \leq z \leq 1.5)$
- b** $P(z \geq 2)$
- c** $P(z \leq 1.5)$
- d** $P(z \geq -1)$
- e** $P(z \leq -3)$
- f** $P(-1 \leq z \leq 1)$
- g** $P(-2.5 \leq z \leq .5)$

A2. Suppose that the random variable x is normally distributed with mean $\mu = 1,000$ and standard deviation $\sigma = 100$. Find each of the following probabilities, **(perform operations on EXCEL)**

- a** $P(1,000 \leq x \leq 1,200)$
- b** $P(x > 1,257)$
- c** $P(x < 1,035)$
- d** $P(857 \leq x \leq 1,183)$
- e** $P(x \leq 700)$
- f** $P(812 \leq x \leq 913)$

B. Chapter 8: Confidence Intervals.

B1. Open GasMiles.xlsx. Perform a Descriptive statistics from EXCEL. Use the **stadand error (se)** from the summary. Calculate 95%, 98%, 99% Confidence Intervals for the population mean. **(perform operations on EXCEL)**

- (a) 95% CI
- (b) 98% CI
- (c) 99% CI.

B2. Problem on Page 4

C. Chapter 9: Hypothesis Testing

Open **Height-Weight.xlsx**. Suppose these data to be sample data from a large population. ,
(perform operations on EXCEL),

C1. Test the Hypothesis: $H_0 : \mu = 170$

$$H_a: \mu \neq 170$$

μ is the population average for Height. $\alpha = 0.05$

C2. On page 6

D. Chapter 13: Simple Linear Regression

* Open file: **Height-Weight.xlsx**. The table gives Height (in centimeters) and Weight (in kilograms), for a sample of $n=15$, 18 years old girls. Interest in predicting the weight from height.

* Draw a scatterplot of Weight on the Horizontal, versus Height on the Vertical. Notice any pattern.

(1) Calculate the coefficient of correlation r

(2) From the Summary Output:

(a) Coefficient of determination $R =$ _____

(b) $R^2 =$ _____

(c) Standard error (of the residuals)= _____

(d) Number of observations= _____

(3) From the ANOVA (Analysis of Variance) output:

SS (Sum of Squares); df (degree of freedom); MS (Mean Square)

(e) $SS_{Reg} =$ _____ ; $df_{Reg} =$ _____ ; $MS_{Reg} =$ _____ ;

(f) $SS_{Res} =$ _____ ; $df_{Res} =$ _____ ; $MS_{Res} =$ _____

(g) $SS_{Total} =$ _____ ; $df_{total} =$ _____ ;

(h) F-statistic = _____; P-value = _____

(4) From the Coefficients part,

(i) β_0 = _____ ; the standard error of the Intercept _____
t-stat = _____ ; P-value = _____

(j) Slope β_1 = _____ the standard error of the Intercept ; _____
t-stat = _____ ; P-value = _____

(k) Write equation of the regression line:

$$\hat{y} = \beta_0 + \beta_1 x$$

➔ **Problem D: Do on EXCEL**

- (1) Calculate r $r = \frac{S_{XY}}{\sqrt{S_{XX}} * \sqrt{S_{YY}}}$
(2) Calculate $\beta_1 = \frac{S_{XY}}{S_{XX}}$
(3) Calculate $\beta_0 = \bar{y} - \beta_1 * \bar{x}$

$$S_{XY} = \sum xy - \frac{(\sum x)(\sum y)}{n} ; S_{XX} = \sum x^2 - \frac{(\sum x)^2}{n} ; S_{YY} = \sum y^2 - \frac{(\sum y)^2}{n}$$