

Question# 1

The variance in the filling amounts of cups of soft drink from an automatic drink machine is an important consideration to the owner of the soft-drink service. If the variance is too large, overfilling and underfilling of cups will cause customer dissatisfaction with the service. An acceptable variance in filling amounts is less or equal 0.25 where filling amounts are measured in ounces. In a test of filling amounts for a particular machine, a sample of 18 cups showed a sample variance of 0.4 ounces.

- a- Do the sample results indicate that the filling mechanism on the machine should be adjusted due to a large variance in filling amounts? Test using a 5% level of significance.
- b- Provide a 90% confidence interval for the variance in the filling amounts for this machine.

Question # 2

The Palestinian company for nectar juice Marawi, produces three types of nectar juice, type A, type B and type C. A sample of 200 customers were interviewed. They were asked to specify what is their favorite kind of nectar juice. The sample showed the following results:

Type	Frequency
A	75
B	60
C	65

The company manager wants to see if there is a difference in the percentage of preference among Marawi customers concerning the three types of nectar juice.

- a- State the null and alternative hypothesis.
- b- Compute your test statistics.
- c- Make your conclusion.

Question # 3

Thirty customers in a given bank were randomized on three different tellers. The bank manager wanted to test the time that each teller will take in providing the service to the customers. Each teller serviced 10 customers. The average and standard deviation for each time was recorded. The following results were obtained:

Teller #	Average service time (minutes)	Standard Deviation (minutes)	# of customers.
1	7	2	10
2	10	1	10
3	6	1	10

Does the data provide sufficient evidence on the mean service time by the three different tells. Use Bonferroni Adjustment to construct confidence interval for each mean of the three tellers using 95% CI. What are the assumptions you made on the data for constructing the three confidence intervals.

Question # 4

## Regression

### Variables Entered/Removed<sup>b</sup>

Model	Variables Entered	Variables Removed	Method
1	YERSCHO L YERSCHO <sub>a</sub> L	.	Enter

- a. All requested variables entered.  
b. Dependent Variable: DWAGE daily wage in NIS

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.158 <sup>a</sup>	.025	.025	47.057

- a. Predictors: (Constant), YERSCHOL YERSCHOL

### ANOVA<sup>b</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	181780.7	1	181780.663	82.091	.000 <sup>a</sup>
	Residual	7074926	3195	2214.374		
	Total	7256707	3196			

- a. Predictors: (Constant), YERSCHOL YERSCHOL  
b. Dependent Variable: DWAGE daily wage in NIS

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	49.040	2.495		19.659	.000
	YERSCHOL YERSCHOL	1.861	.205	.158	9.060	.000

a. Dependent Variable: DWAGE daily wage in NIS

The following output is obtained from running regression on the labor force data (2003, PCBS, 1<sup>st</sup> quarter) using daily wage as dependent variable and years of education as independent variable

- a- state the estimated regression equation from the output.
- b- Interpret the value of  $B_1$ -hat. Is it worth it to invest in more years of education? Explain.
- c- What is the standard error of  $B_1$ -hat and interpret its value.
- d- Construct a 95% CI for  $B_1$ .
- e- Predict the daily wage of a person who got 12 years of education.
- f- What is the value of R-square and interpret its value.
- g- What are SSE , SSR and SST.