Mod 2 Exam

1. During an hour at a fast food restaurant, the following types of sandwiches are ordered:

Turkey Turkey Cheeseburger Hamburger Fish Chicken Hamburger Cheeseburger Fish Hamburger Turkey Chicken Fish Chicken Fish Turkey Fish Hamburger Fish Hamburger Cheeseburger Fish Cheeseburger Fish Fish Cheeseburger Hamburger Fish Turkey Turkey Chicken Fish Chicken Cheeseburger Fish Turkey Fish Fish Hamburger Fish Fish Turkey Chicken Hamburger Fish Cheeseburger Chicken Turkey Fish Hamburger Chicken Fish Chicken

a) Make a frequency distribution for this data.

b) Make a relative frequency distribution for this data. Include relative percentages on this table.

				- uk
Sanwiches	Frequency		cale	2.C ^{0.U.}
Turkey	9		Notesa	
Cheeseburger	7	N from	2 of 23	
Hamberger	reviev	Dage	2 4 9	
Fish	19			
Chicken	9			
Total	53			
Sanwiches Percent	Frequency	Relative Freq.	Relative	
Turkey 17%	9	9/53=0.17		
Cheeseburger	7	7/53=0.13	13%	
Hamberger	9	9/53=0.13	17%	
Fish	19	19/53=0.36	36%	
Chicken	9	9/53=0.17	17%	
Total	53			
	Sanwiches Turkey Cheeseburger Hamberger Fish Chicken Total Sanwiches Percent Turkey 17% Cheeseburger Hamberger Fish Chicken	SanwichesFrequencyTurkey9Cheeseburger7Hamberger9Fish19Chicken9Total53Sanwiches PercentFrequencyTurkey 17%9Cheeseburger7Hamberger9Fish19Chicken9Turkey 17%9Cheeseburger7Fish19Chicken9Total53	SanwichesFrequencyTurkey9Cheeseburger7HambergerEvenFish19Chicken9Total53SanwichesFrequencyPercent917%9Cheeseburger777/53=0.1717%9Fish19Cheeseburger999/53=0.13Hamberger999/53=0.13Fish19199/53=0.13Chicken999/53=0.13Fish19199/53=0.13Chicken999/53=0.13Chicken999/53=0.13Chicken999/53=0.13Chicken999/53=0.131919/53=0.131019/53=0.13111912191319141915191519151915191519151915191519151915191519151915191519151015101510151015101510151015	Sanwiches Frequency Turkey 9 Cheeseburger 7 Hamberger Percent 19 Total 53 Sanwiches Percent 9 Turkey 9 Chicken 9 Sanwiches Percent 9 Turkey 9 Cheeseburger 7 Turkey 9 19 Portal 19 Portal 19 Porta

2

Exam 9

1. Suppose you have 45 data points and you calculate the sample correlation coefficient and find that **r** = .32. Can you be 95% confident that a linear relation exists between the variables? If so, is the relation positive or negative? Justify you answer.

Note that for n=45 and 95% we get a value from the chart of .29396. The absolute of r is |r|=.32, which is above .29396. So a positive linear relation exists.

2. Suppose you have 60 data points and you calculate the sample correlation coefficient and find that **r = .20**. Can you be 95% confident that a linear relation exists between the variables? If so, is the relation positive or negative? Justify you answer.

Note that for n=60 and 95% we get a value from the chart of .25420. The absolute of r is |r|=.20, which is below .25420. So no linear relation exists.



3. Compute the sample correlation coefficient for the following data:

Can you be 95% confident that a linear relation exists between the variables? If so, is the relation positive or negative? Justify you answer.

c=0.87834 x*=6.4 y*=12 Sx=2.702 n=5r=-0.966 IrI=0.966 Sy=3.54

The absolute value of negative r is greater than the critical value correlation coefficient. There is a negative linear relation between the variables.

4. Find the best fit line for the following data:

х	У
2	3
3	6
7	10
9	14
12	17

5. The mayor of a large city claims that 30 % of the families in the city earn more than \$ 100,000 per year; 52 % earn between \$ 30,000 and \$ 100,000 (inclusive); 18 % earn less than \$ 30,000 per year.

In order to test the mayor's claim, 285 families from the city are surveyed and it is found that:

90 of the families earn more than \$ 100,000 per year; 135 of the families earn between \$ 30,000 and \$ 100,000 per year (inclusive); 60 of the families earn less \$ 30,000.

Test the mayor's claim based on 5 % significance level.

We will set

H₀: The mayor's distribution is correct. H₁: The mayor's distribution is not correct.

This is a multinomial experiment, for multinomial experiments, we use the chi-square distribution.

Calculate the degrees of freedom for three possible outcomes: DOF=3-1=2. Our level of significance is 5 % (.05). So look up DOF of 2 and .05 on the Chi-square distribution table to get 5.991.

 $X^{2} = \frac{(90 - 85.5)^{2}}{85.5} + \frac{(135 - 148.2)^{2}}{148.2} + \frac{(60 - 51.3)^{2}}{51.3} = 2.89.$

This is smaller than the critical value of 5.991. Therefore, we do not reject the null hypothesis.