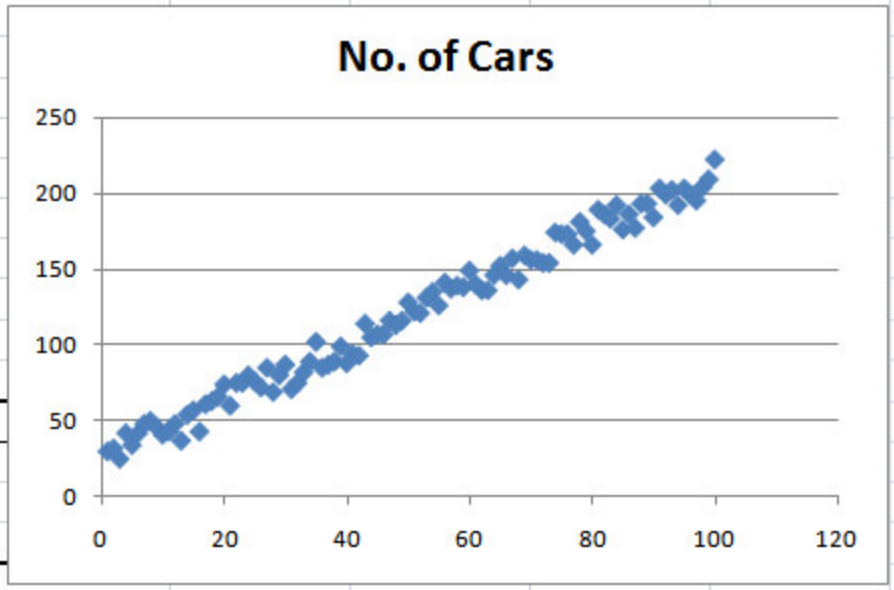
Regression 1 Problem from Test 1, Fall 2008

1. Table 2 below shows the Summary Output for using regression analysis to forecast weekly number of cars sold in the last 100 weeks. Answer the following questions based on the information provided in Table 2.

Table 2. Simple Linear Regression Analysis for Car Sales

	A	B	C	D	E	F	G
1	SUMMARY OUTPUT						
2							
3	*Regression Statistics*						
4	Multiple R	0.9897					
5	R Square	0.9795					
6	Adjusted R Square	0.9793					
7	Standard Error	7.8728					
8	Observations	100					
9							
10	ANOVA						
11		*df*					
12	Regression	1					
13	Residual	98					
14	Total	99					
15							
16		*Coefficients*	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
17	Intercept	25.9636	1.5864	16.3660	0.0287	22.8154	29.1119
18	Week	1.8671	0.0273	68.4571	0.0147	1.8129	1.9212
19							
20	*Week*	*No. of Cars*	*Predicted No. of Cars*				
21	*1*	*30*	...				
22	...	...	...				
23	...	...	...				
24	99	209	...				
25	100	222	...				
26	*101*						
27							



(1) (10 pts.) What is the general linear model to be used to model the linear trend for the number of cars sold overtime?

(2) Answer the following two questions:

a. (2 pts) What is the estimated value of b_0 ,

b. (4 pts) How do you interpret the meaning of b_0?

(3) You are asked to predict the weekly number of cars to be sold for the week 101:

a. (6 pts.) What is the Excel@ formula of the estimated regression function in Cell C26 of Table 2?

b. (3 pts.) What is the predicted number of cars to be sold in Week 101? (show details)

(4) With Table 2, use the *p*-value approach to test the population parameter β_0, and state your conclusion. Assume a significant level of α value of 5%.

a. (3 pts.) What are the null (H_0) and alternative (H_1) hypothesis?

b. (5 points) What are the decision rules?

c. (3 pts.) What is your conclusion and what that means to your car sales forecasting?

(5) In terms of the prediction confidence interval:

a. (3 pts.) What is the margin of error for an approximated 95% prediction interval of the number of cars to be sold in Week 101?

b. (5 pts.) What is the approximated 95% prediction interval of number of cars to be sold in Week 101?