Answer all questions. Write clearly and legibly. Good Luck!!

The CEOSAL data is used to run several regressions. The mean and standard deviations of the selected variables are given below. The dependent variable in all the regressions is ln(salary) which the natural logarithm of salary (in 1,000$). The other variables are mktval = market value of the company, age = age of the CEO, comten = # of years with the company, ceoten = # of years in the company as a CEO.

Variable	ln(salary)	ln(sales)	ln(mktval)	age	comten	ceoten
Mean	6.58	7.23	7.4	56.4	22.5	7.95
Std deviation	0.60	1.43	1.13	8.42	12.29	7.15

The regression results for 4 models are reported in the following table. **Number of observations used is 177.**

	Model 1		Model 2		Model 3		Model 4	
Variable	Coeff	Std.err.	Coeff	Std.err.	Coeff	Std.err	Coeff	Std.err.
Intercept	4.561	.3380	4.880	.1997	4.943	.1939	6.551	.0386
ln(sales)	.1917	.0400	.2481	.0272	.2494	.0273	.2481	.0272
ln(mktval)	.0940	.0491	--	--	--	--	--	--
age	.0003	.0052	--	--	--	--	--	--
comten	-.0095	.0036	-.010	.0033	--	--	-.010	.0033
ceoten	.0168	.0057	.0170	.0056	--	--	.0170	.0056
zzz	--	--	--	--	-.0110	.0032	--	--
R^2	.3484	--	.3343	--	.3280	--	.3343	--
Adj R^2		--		--		--		--
SSR		--		--		--		--

Note: The variable zzz is defined as zzz = comten-ceoten.

(a) Interpret the coefficients of ln(sales), ln(mktval), ceoten in **Model 1**. Compute and comment on the marginal effects of ln(sales) and ceoten if you add the interaction term, the product of ln(sales) and ceoten, the coefficient on which is .012.

(b) Test the hypothesis that the coefficient on age is zero against a two-sided alternative in **Model 1**. What is the p value of this test?

(c) Test the hypothesis that the coefficient on comten is zero against a one-sided alternative (< 0 type) in **Model 1**. What is the p value of this test?

(d) Compute a 95% confidence interval for the coefficient on ln(sales) in **Model 1** and interpret it.

(e) Using **appropriate models** from the above table, test the hypothesis that the coefficients on ln(mktval) and age are **jointly** zero at the 5% level of significance.

(f) Test the hypothesis that there is no regression at the 5% level of significance in **Models 1 and 2**.

(g) How would you test the hypothesis that the coefficient on comten + the coefficient on ceoten = 0? Assume that the regressors in the unrestricted model are ln(sales), comten, and ceoten (plus the intercept). To test his hypothesis I defined the zzz variable **(zzz = comten-ceoten)** and ran the restricted model (labeled as **Model 3**). How can you use the results from this regression to test the above hypothesis? Show the test procedure.

(h) Compute adjusted R^2 and SSR for **Models 1-3** above.

(i) Calculate the beta coefficients and their standard errors for **Model 2**.

(j) I wanted to forecast ln(salary) based on **Model 2** when ln(sales) = 7, comten = 20, and ceoten = 8. For this I subtracted 7, 20 and 10, respectively from ln(sales), comten and ceoten. The regression results are reported under Model 4. Use the results from Model 4 to predict mean ln(salary) and construct a 95% confidence interval for it when ln(sales) = 7, comten = 20, and ceoten = 8.