History 595 Final Examination Extra Credit: 15 points

You may substitute this question for 15 points on the main exam, or do it in addition to the main exam to boost your final score. Wrong answers on the extra credit will not mark you down on the main exam unless you are using it to substitute for 15 points on the main exam. Obviously wrong answers on the extra credit will mean you won't reach a possible 100 correct points.

Attached below are a small data set (Table A.1) on key variables for major league baseball players. The regression models on the next pages, Tables 3.1, 4.1, and 5.3, use the data in Table A.1 to model the determinants of the 1998 salary of these players.

(Note: the convention of putting an E- plus a number after a reported statistic means that you should move the decimal place for the statistics to the left by the number of places indicated. So, in Table 4.1, the Significance of F in the ANOVA table is 6.05257E - 07 should be read as .000000605257.)

Answer the following questions on the basis of these models. Identify the statistics in the model you are using to justify your answer.

1. True/False. More experienced players (measured by the number of years in the majors) make more than less experience players.

2. True/False. It is possible to model the salary of major league baseball players with a high degree of accuracy.

3. True/False. A player who is trying to maximize his salary would do better to improve his fielding than he would if he improved his batting.

4. True/False. Minority players make less than non minority players.

5. True/False. As a player reaches the end of his career, his earning capacity tapes off.

6. Calculate Paul Molitor's predicted salary in 1998 from the three models and discuss the differences among the three estimates and the actual salary from Table A.1.

TABLE A.1 MLB Data

Player	1998 Salary	Team	League AL = 0, NL = 1	Career 97 MLB Years	Career 97 Slugging	Career 1997 Fielding %	Black 1 = yes, 0 = no	Hispanic 1 = yes, 0 = no
Abreu, Bob	0.18	PHI	1	1	372	97.92	1	0
Anderson, Brady	5.442	BAL	0	11	434	98.78	0	0
Bagwell, Jeff	7.945	HOU	1	7	535	99.25	0	0
Bonds, Barry	8.917	SF	1	12	551	98.44	1	0
Boone, Bret	2.800	CIN	1	5	398	98.88	0	0
Bordick, Mike	3.583	BAL	0	7	327	97.89	0	0
Damon, Johnny	0.400	KC	0	2	387	98.63	0	0
Galarraga, Andres	8.000	ATL	1	12	494	99.17	0	1
Griffey, Ken Jr.	7.979	SEA	0	9	560	98.62	1	0
Grissom, Marquis	5.000	MIL	1	8	413	98.75	1	0
Guerrero, Vladimir	0.230	MON	1	1	483	93.37	1	0
Gwynn, Tony	4.000	SD	1	16	454	98.63	1	0
Hamilton, Darryl	2.750	COL	1	8	381	99.37	0	0
Higginson, Bobby	2.425	DET	0	3	499	97.33	0	0
Justice, David	6.500	CLE	0	8	511	97.72	1	0
Karros, Eric	4.500	LA	1	6	455	99.23	0	0
McGwire, Mark	8.333	STL	1	10	554	99.21	0	0
Molitor, Paul	4.250	MIN	0	19	451	96.97	0	0
O'Neill, Paul	5.450	NYY	0	11	472	98.98	0	0
Piazza, Mike	8.000	LA	1	5	575	98.87	0	0
Ripken, Cal Jr.	6.300	BAL	0	17	450	97.8	0	0
Rodriguez, Alex	2.113	SEA	0	3	539	96.52	1	0

TABLE A.1 (Continued)

Player	1998 Salary	Team	League AL = 0, NL = 1	Career 97 MLB Years	Career 97 Slugging	Career 1997 Fielding %	Black 1 = yes, 0 = no	Hispanic 1 = yes, 0 = no
Rodriguez, Ivan	6.600	TEX	0	7	437	98.88	0	1
Salmon, Tim	5.000	ANA	0	5	527	97.59	0	0
Sosa, Sammy	8.000	CHC	1	8	468	96.87	1	0
Stairs, Matt	0.325	OAK	0	2	511	97.05	0	0
Thomas, Frank	7.000	CWS	0	8	601	99.06	1	0
Vaughn, Greg	5.250	SD	1	9	452	98.4	1	0
Vaughn, Mo	6.600	BOS	0	7	532	98.79	1	0
Ward, Turner	0.750	PIT	1	3	434	99	0	0
Williams, Matt	4.800	ARI	1	11	497	96.25	0	0
Zaun, Greg	0.280	FLA	1	1	441	98.42	0	0

1998 Salary = reported salary, in millions of dollars, the player earned for the 1998 MLB season.

League = 1 if the player was playing in the National League, 0 if in the American League.

Career 97 MLB Years = number of seasons through 1997 the player has played at least 130 at bats.

Career 97 Slugging = slugging average through 1997, calculated as the ratio (number of bases reached)/(number of at bats)*1000.

Career 97 Fielding % = fielding percentage through 1997, calculated as the ratio (assists + putouts)/(assists + putouts + errors)*100

Black = 1 if a player is Black, 0 otherwise.

Hispanic = 1 if a player is Non-Black Hispanic, 0 otherwise.

TABLE 3.1

Summary Output

Regression Statistics

Multiple *R*	0.578533258
R Square	0.334700731
Adjusted *R* Square	0.312524088
Standard Error	2.30354598
Observations	32

ANOVA

	df	SS	MS	
Regression	1	80.08563793	80.08563793	
Residual	30	159.1897224	5.306324081	
Total	31	239.2753604		
	Coefficients	Standard Error	*t* Stat	*P* Value
Intercept	2.031527236	0.793688934	2.55960131	0.015759687
YEARS	0.349969303	0.090084385	3.884905278	0.000523394

TABLE 4.1

Summary Output

Regression Statistics

Multiple *R*	0.81968142
R Square	0.67187763
Adjusted *R* Square	0.636721662
Standard Error	1.674510571
Observations	32

ANOVA

	df	SS	MS	*F*	Significance *F*
Regression	3	160.7637621	53.58792068	19.11133911	6.05257*E* − 07
Residual	28	78.51159831	2.803985654		
Total	31	239.2753604			
	Coefficients	Standard Error	*t* Stat	*P* value	
Intercept	−76.23398562	24.66415923	−3.090881181	0.004480813	
YEARS	0.290659321	0.066903021	4.344487227	0.000165835	
SLUGGING	0.022151184	0.004662842	4.750575814	5.48454*E* − 05	
FIELDING	0.694846331	0.249833078	2.781242322	0.009577761	

TABLE 5.3

Model Summary

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate
1	0.921[a]	0.849	0.805	1.2272

[a]Predictors: (Constant), LEAGUE, HISPANIC, YEARS SQUARED, SLUGGING, FIELDING, BLACK, YEARS.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	*F*	Sig.
1	Regression	203.132	7	29.019	19.269	0.000[c]
	Residual	36.143	24	1.506		
	Total	239.275	31			

[b]Dependent variable: SALARY.

[c]Predictors: (Constant), LEAGUE, HISPANIC, YEARS SQUARED, SLUGGING, FIELDING, BLACK, YEARS.

Coefficients[d]

Model		Unstandardized Coefficients		*t*	Sig.
		B	Std. Error		
1	(Constant)	−27.143	21.482	−1.264	0.219
	YEARS	1.119	0.189	5.929	0.000
	YEARS SQUARED	−4.53*E* − 02	0.010	−4.584	0.000
	SLUGGING	1.732*E* − 02	0.004	4.727	0.000
	FIELDING	0.187	0.220	0.851	0.403
	BLACK	0.235	0.497	0.473	0.641
	HISPANIC	1.495	0.937	1.597	0.123
	LEAGUE	0.249	0.445	0.560	0.581

[d]Dependent variable: SALARY.