**#1.** It has been hypothesized that overall academic success for college freshmen as measured by grade point average (GPA) is a function of IQ scores, *X1*, hours spent studying each week, *X2*, and one's high school average, *X3*. Suppose the regression equation is   . The multiple standard error is 6.313 and *R2* = 0.826.

1. What is the predicted GPA for a student with an IQ of 108, 32 hours spent studying per week, and a high school average of 82?
2. Assuming other independent variables are held constant, what is the effect on GPA if the number of hours spent studying per week increases from 32 to 36?
3. Which independent variable has the smallest effect on GPA?
4. Which independent variable has the greatest effect on GPA?

**#2.** Using the provided data (uploaded in simaster – materials) with following variables:

|  |  |
| --- | --- |
| **Variable Name** | **Description** |
| fips | County code |
| STNAME | State Name |
| CTYNAME | County Name |
| NETMIG2018 | County Net Migration Year 2018 |
| Laborforce | # Labor Force |
| Employed | # Employed Person |
| Unemployed | # Unemployed Person |
| Unemploymentrate | Rate of Unemployment |
| HPI\_2014\_with\_2000\_base | Housing Price Index |
| Metro | Dummy Variable (Metro=1; Non-Metro=0) |
| annualaveragetemp | Annual Average Temperature (in Fahrenheit) |
| AvgDailyPrecipitation | Annual Average Daily Precipitation |

* 1. Show and describe a scatter plot of net migration & the unemployment rate; net migration & Annual Average Temperature; net migration & Annual Average Daily Precipitation.
  2. Conduct a correlation analysis with all variables except the fips, State name, and County name.
  3. Do the simple regression one by one: net migration as Y and unemployment rate, Metro, Annual Average Temperatures, and Annual Average Daily Precipitation as X.
  4. Interpret results from point C.
  5. Do stepwise regression with all variables mentioned at point C.
  6. Interpret the results from point E. (you should at least have four different models from E)
  7. Assuming you work as a researcher, what variable do you want to add to the migration model or theory can be added to the migration model (use citation system APA or MLA if you quote some article).