

If R is used, present the required output and the (relevant) syntax.

1. The data set `Robey.txt` (and description `Robey.pdf`) contains two quantitative variables (one response and one predictor) and one categorical variable (i.e., a factor). After reading the description of your data, determine which variable makes more sense to use it as response, and answer the following questions:
  - a) Perform a one-factor design analysis with the appropriate variables and determine if there are significant differences on the expected response when `region = Africa` vs `region = Near.East` and when `region = Asia` vs `region = Latin.Amer`.
  - b) In your previous model, explain what each regression coefficient means and write out the mean function for each category of the factor.
  - c) Obtain and describe the “effects” plot for your one-way design.
  - d) Obtain a scatterplot for a model with both the factor and the continuous regressor. Does the graph suggest that changes in your continuous regressors are associated to changes on your expected response? Does it suggest that different slopes should be considered for different factor levels? Does it suggest that different intercepts should be considered for different factor levels? Explain.
  - e) Obtain a model with interaction and interpret three estimated coefficients, one related to the factor, one related to the continuous regressor, and one related to the interaction.
  - f) Should you include interactions in your model? Should you include the continuous regressor? Should you include the factor? Explain.
  - g) Based on the previous part, obtain a final model, an effects plot for the model, and describe your plot.
  - h) Based on your chosen model, obtain and interpret a prediction interval for a new observation where the new value for the predictor is equal to its (sample) mean and the region is Asia.