Equitable Equations: *Regression and correlation in R*

For each of the following problems,

(a) Compute the correlation between the variables.

(b) Find the equation of the regression line.

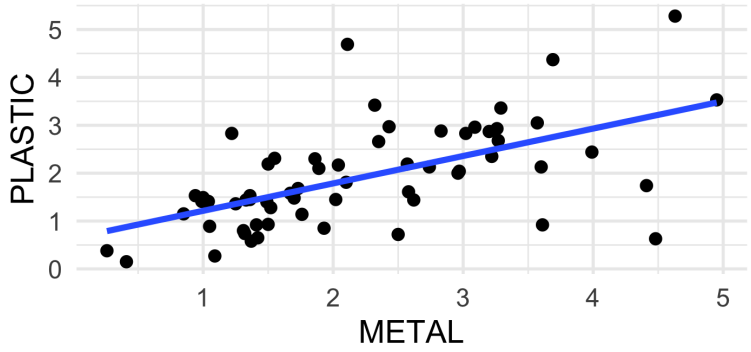
(c) Interpret the slope of the regression line in ordinary human language.

(d) Find the fitted value and residual for the specified observation, or say why doing so would be inappropriate.

Use R for all calculations. Include both code and output with your solutions.

Problem 1

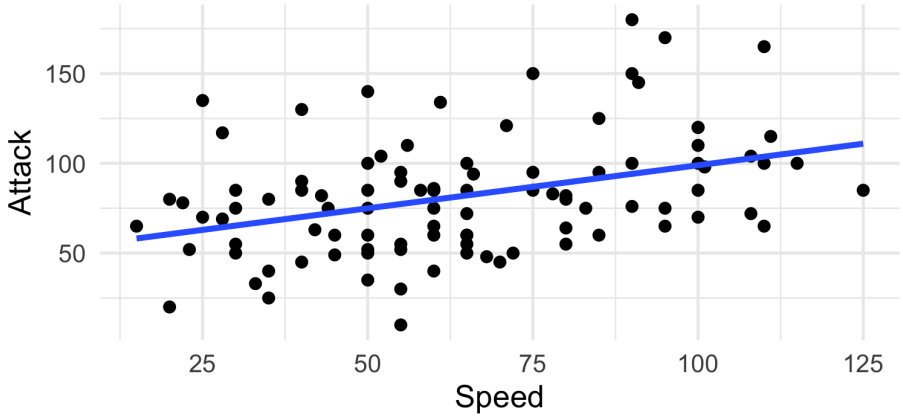
Using the `garbage_weight` data set, available on Moodle, model the weight of plastic waste using the weight of metal waste.



Consider an observation with 2.11 pounds of metal waste and 4.69 pounds of plastic waste

Problem 2

Using the `pokemon_sample` data set, available on Moodle, model the attack ratings of Pokemon using their speeds.



Consider a Pokemon with a speed of 150 and an attack of 100.

1) a) lm(PLASTIC ~ METAL, data = garbage_weight)

coefficients:

(Intercept)	METAL
0.6411	0.5725

b) $y = 0.6411 + 0.5725x$

c) It is likely that for every pound of metal waste that is thrown out 0.5725 pounds of plastic waste are thrown out.

d) Fitted value: 2.111bs of metal waste and 1.841bs of plastic waste

$\varepsilon_i = 4.69 - 1.84 = 2.85$

2) a) lm(Attack ~ Speed, data = pokemon_sample)

coefficients:

(Intercept)	Speed
50.1866	0.4932

b) $y = 50.1866 + 0.4932x$

c) For every one unit that speed increases, attack increases by 0.4932

d) It is inappropriate to calculate a fitted value since it would be an extrapolation