Assignment 6: Under (blood) pressure

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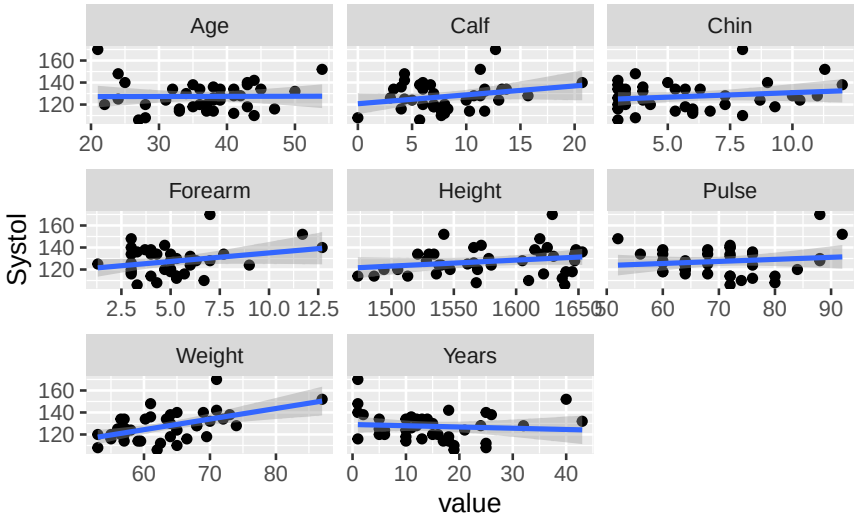
Exercise 1

```
## `geom_smooth()` using formula = 'y ~ x'
```



Exercise 2

i) Years graph, the blue regression line tilts slightly down. Therefore, there is a weak negative correlation between Years and Systol.

ii) Forearm and Calf also show positive slopes, but Weight is the largest and most pronounced. Therefore, the answer is Weight.

Exercise 3

```
blood_pressure_updated <- blood_pressure %>%
  mutate(urban_frac_life = Years / Age)
```

Exercise 4

```
systol_urban_frac_model <- lm(Systol ~ urban_frac_life, data = blood_pressure_updated)
```

Exercise 5

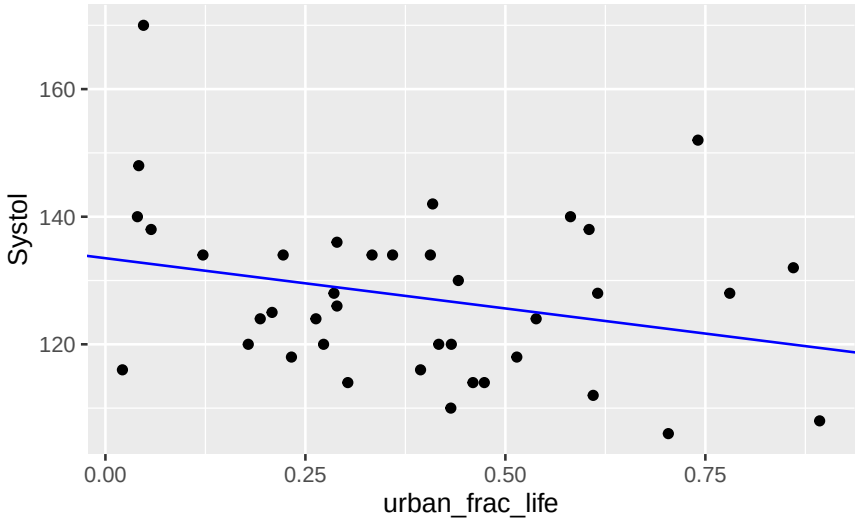
term	estimate	std.error	statistic	p.value
(Intercept)	133.49572	4.038011	33.059770	0.0000000
urban_frac_life	-15.75182	9.012962	-1.747686	0.0888139

r.squared	adj.r.squared	sigma	statistic	p.value	df	logLik	AIC	BIC	deviance	df.residual	nobs
0.0762564	0.0512904	12.76966	3.054406	0.08881391		-153.6478	313.2957	318.2864	6033.372	37	39

Exercise 6

```
systol_urban_frac_df <- blood_pressure_updated %>%
  add_predictions(systol_urban_frac_model) %>%
  add_residuals(systol_urban_frac_model)
```

Exercise 7



Exercise 8

Yes, the volatility seems almost constant, so this model seems to meet the third condition.

Exercise 9

i) The residuals are roughly symmetrical around zero.
ii) Histograms indicate that the residuals are nearly normal, therefore the conditions for near-normal residuals are reasonably met.

Exercise 10

When comparing the two models, the model using the Weight model had a higher R^2 value than the model using the Urban_frac_life model. This means that the Weight model predicts systolic blood pressure better. Therefore, systol_weight_model seems to explain the data better and be more useful for this analysis.

Exercise 11

Exercise 12

Academic Integrity statement