* 1. Students’ accumulative GPA can be a possible target variable.
  2. It is continuous.
  3. Students’ GRE score. Students’ ILETS or TOEFL score can also be a variable.
  4. A linear model should be reasonable for the data. I expect the model as a increasing linear function. The student with higher GRE score should have higher GPA.
  5. x\_bar = (0 + 1 + 2 + 3 + 4) / 5 = 2

y\_bar = (0 + 2 + 3 + 8 + 17) / 5 = 6

* 1. s\_x^2 = 2.5

s\_y^2 = 46.5

s\_xy = 8

* 1. The least squares parameters are beta\_0 and beta\_1.

beta\_1 = s\_xy / s\_x^2 = 3.2

beta\_0 = y\_bar – beta\_1 \* x\_bar = -0.4

* 1. When x = 2.5, y = 7.6

Now z\_0 and a appeared linearly.

* 1. RSS =

By replacing with , with , with and with , we got RSS = , which is exactly the same as the original model.

We know the solution to the original model are

,

By replacing variables back, we got

, ,

图形用户界面, 文本

描述已自动生成

* 1. RSS =

When , RSS has the minimum value.

Let ,