

Codeblock 1

```
> lm_sw_bw <- lm(SlaughterWeight ~ BodyWeight, data = tbl_sw_bw)
> summary(lm_sw_bw)
```

Call:
lm(formula = SlaughterWeight ~ BodyWeight, data = tbl_sw_bw)

Residuals:

Min	1Q	Median	3Q	Max
-5.6315	-2.3371	-0.4092	1.2852	9.5908

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-28.2542	62.3902	-0.453	0.660314
BodyWeight	0.5778	0.1238	4.665	0.000887 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 4.252 on 10 degrees of freedom
Multiple R-squared: 0.6852, Adjusted R-squared: 0.6537
F-statistic: 21.76 on 1 and 10 DF, p-value: 0.0008873

Codeblock 2

```
> n_res_var <- 18.1
> n_nr_records <- nrow(tbl_sw_bw)
> X <- matrix(c(rep(1, n_nr_records), tbl_sw_bw$BodyWeight), ncol = 2)
> y <- tbl_sw_bw$SlaughterWeight
> beta <- c(0,0)
> meanBeta <- c(0,0)
> meanBetaSQ <- c(0,0)
> set.seed(9182)
> n_iter <- 10^5
> for (iter in 1:n_iter){
+   w <- y - X[,2] * beta[2]
+   x <- X[,1]
+   xtxi <- 1/crossprod(x)
+   betaHat <- crossprod(x, w) * xtxi
+   beta[1] <- rnorm(1, betaHat, sqrt(xtxi * n_res_var))
+   w <- y - X[,1] * beta[1]
+   x <- X[,2]
+   xtxi <- 1/crossprod(x)
+   betaHat <- crossprod(x, w) * xtxi
+   beta[2] <- rnorm(1, betaHat, sqrt(xtxi * n_res_var))
+   meanBeta <- meanBeta + beta
+   meanBetaSQ <- meanBetaSQ + beta^2
+   if ((iter%%20000) == 0){
+     cat(sprintf("Iteration: %d ", iter))
+     cat(sprintf("Intercept: %6.3f ", meanBeta[1]/iter))
+     cat(sprintf("Slope: %6.3f ", meanBeta[2]/iter))
+     cat(sprintf("SSQIntercept: %12.2f ", meanBetaSQ[1]))
+     cat(sprintf("SSQSlope: %8.2f ", meanBetaSQ[2]), "\n")
+   }
+ }
```

Iteration: 20000 Intercept: -14.338 Slope: 0.550 SSQIntercept: 245939666.41 SSQSlope: 7006.56
Iteration: 40000 Intercept: -30.399 Slope: 0.582 SSQIntercept: 350352520.14 SSQSlope: 14785.70
Iteration: 60000 Intercept: -26.205 Slope: 0.574 SSQIntercept: 450434755.87 SSQSlope: 21361.47
Iteration: 80000 Intercept: -27.501 Slope: 0.576 SSQIntercept: 500280265.99 SSQSlope: 28301.14
Iteration: 100000 Intercept: -21.925 Slope: 0.565 SSQIntercept: 553799324.41 SSQSlope: 33939.45