Homework_1_Final

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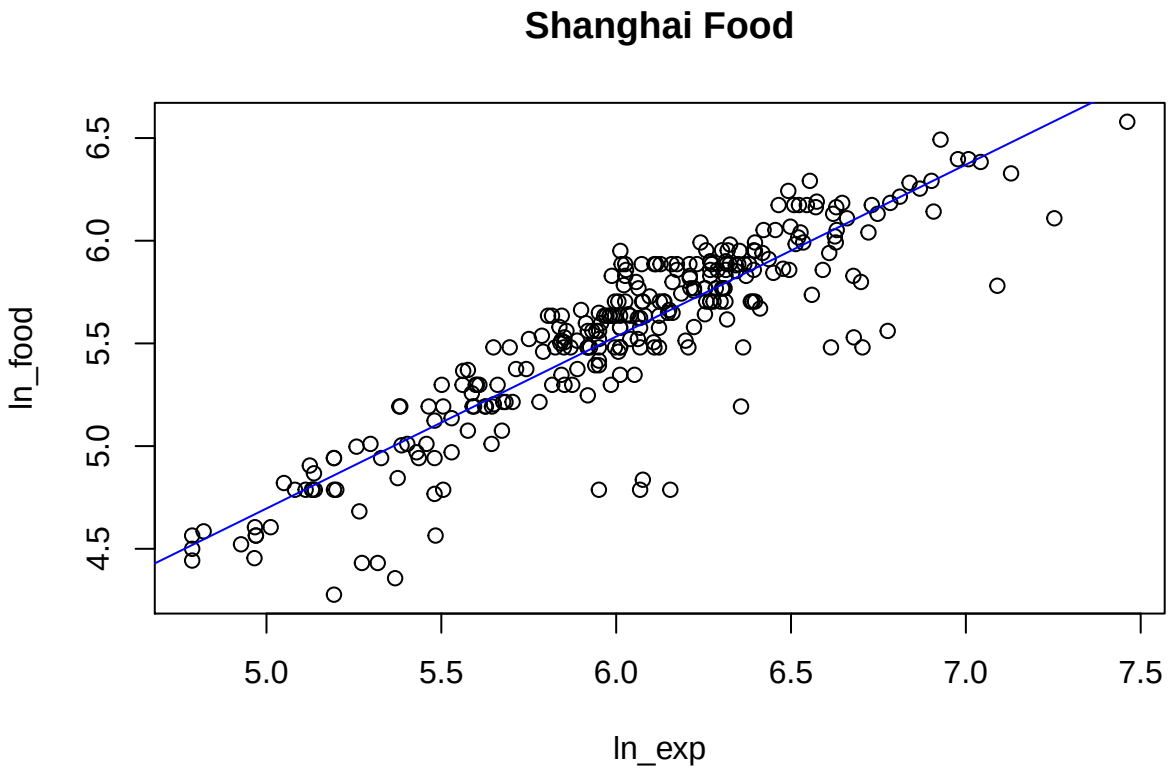
```
lm_shanghai_food = lm(ln_food ~ ln_exp+ln_fam_size,shanghai)
plot(ln_food ~ ln_exp, main = "Shanghai Food", data=shanghai)
abline(lm_shanghai_food, col="blue")
```

```
## Warning in abline(lm_shanghai_food, col = "blue"): only using the first two of 3
## regression coefficients
```



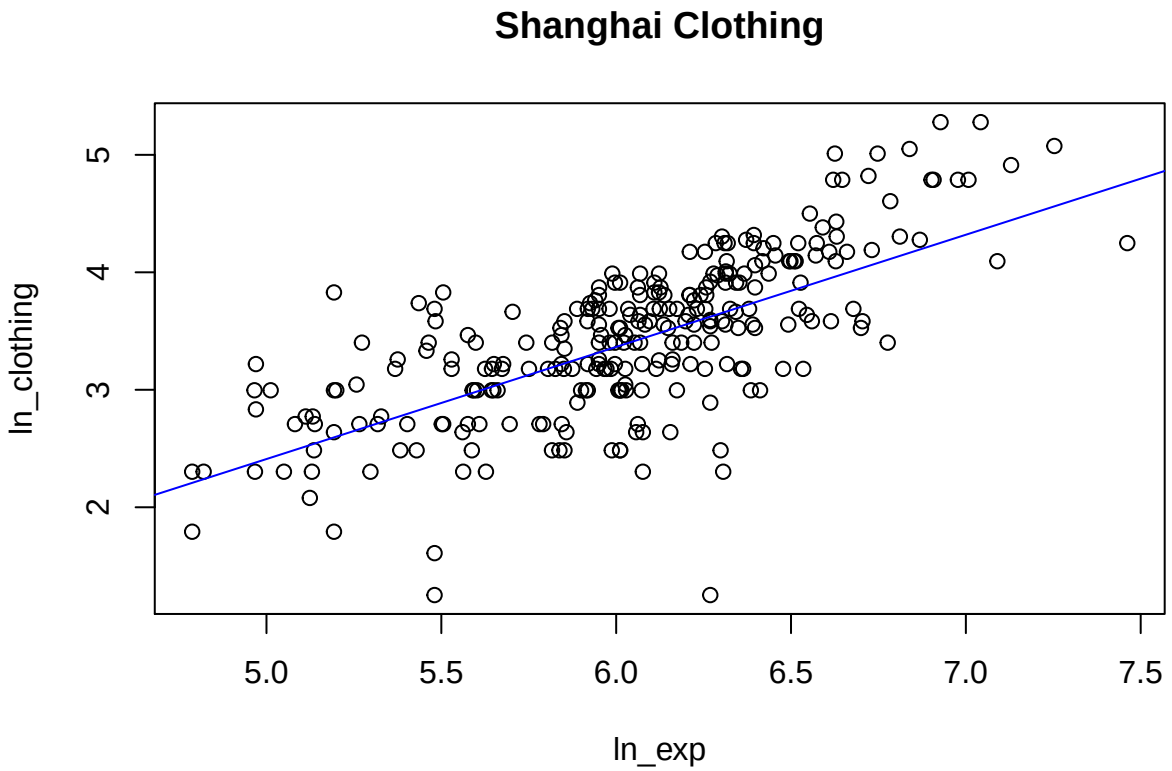

```
summary(lm_shanghai_food)
```

```
##
## Call:
## lm(formula = ln_food ~ ln_exp + ln_fam_size, data = shanghai)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.86115 -0.06763  0.03446  0.11720  0.40731
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)  0.51081    0.16069   3.179  0.00164 **
## ln_exp       0.83709    0.02714  30.845  < 2e-16 ***
## ln_fam_size -0.02071    0.03033  -0.683  0.49544
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2038 on 282 degrees of freedom
## Multiple R-squared:  0.7998, Adjusted R-squared:  0.7984
## F-statistic: 563.4 on 2 and 282 DF,  p-value: < 2.2e-16
```

```
lm_shanghai_clothing = lm(ln_clothing ~ ln_exp+ln_fam_size,shanghai)
plot(ln_clothing ~ ln_exp, main = "Shanghai Clothing", data=shanghai)
abline(lm_shanghai_clothing, col="blue")
```

```
## Warning in abline(lm_shanghai_clothing, col = "blue"): only using the first two
## of 3 regression coefficients
```



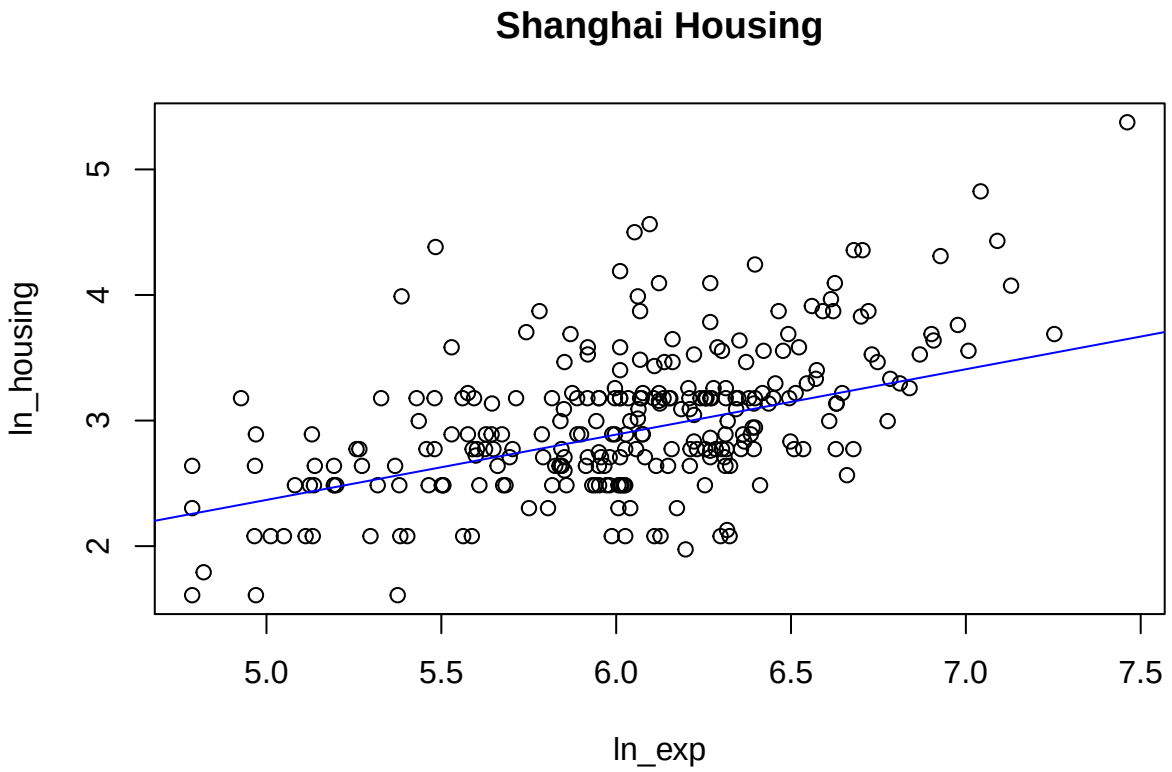

```
summary(lm_shanghai_clothing)
```

```
##
## Call:
## lm(formula = ln_clothing ~ ln_exp + ln_fam_size, data = shanghai)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.48245 -0.28361  0.05102  0.33580  1.23400
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -2.36262    0.38541  -6.130  3.1e-09 ***
## ln_exp       0.95461    0.06491  14.706  < 2e-16 ***
```

```
## ln_fam_size  0.16342    0.07154   2.284   0.0231 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4739 on 270 degrees of freedom
##   (12 observations deleted due to missingness)
## Multiple R-squared:  0.5228, Adjusted R-squared:  0.5193
## F-statistic: 147.9 on 2 and 270 DF,  p-value: < 2.2e-16
```

```
lm_shanghai_housing = lm(ln_housing ~ ln_exp+ln_fam_size,shanghai)
plot(ln_housing ~ ln_exp, main = "Shanghai Housing", data=shanghai)
abline(lm_shanghai_housing, col="blue")
```

```
## Warning in abline(lm_shanghai_housing, col = "blue"): only using the first two
## of 3 regression coefficients
```

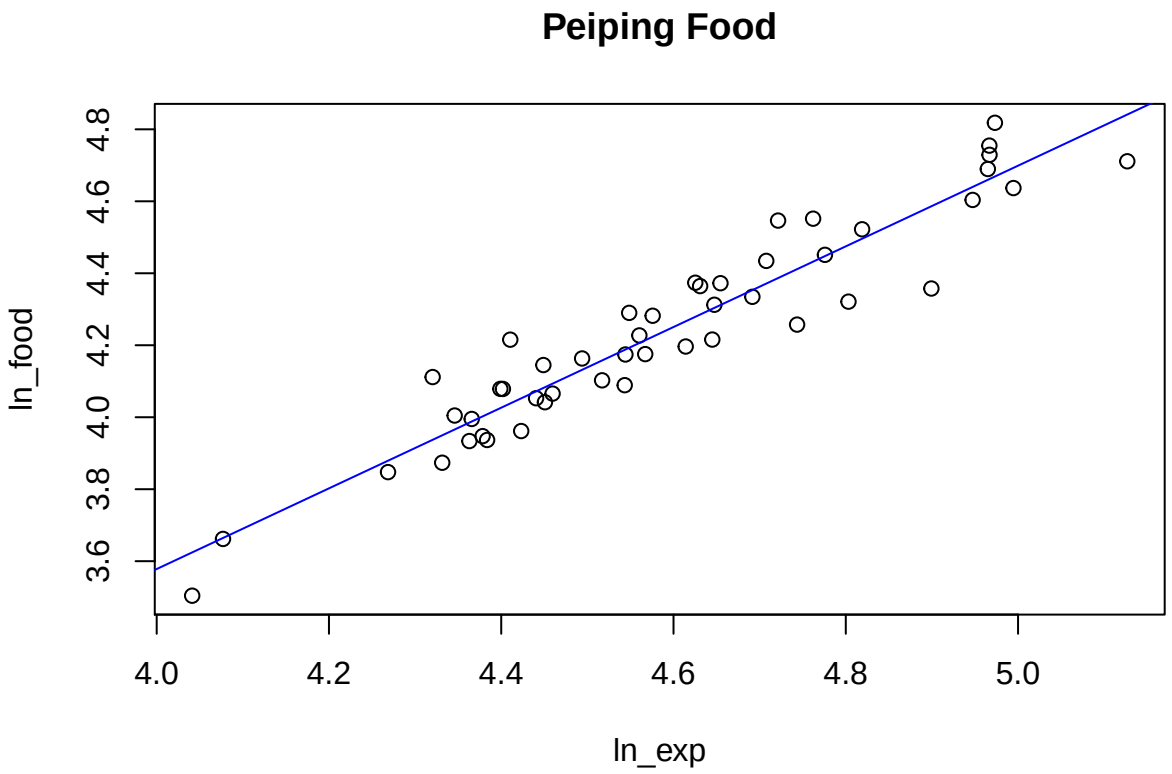



```
summary(lm_shanghai_housing)
```

```
##
## Call:
## lm(formula = ln_housing ~ ln_exp + ln_fam_size, data = shanghai)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.25787 -0.31122 -0.02562  0.26768  1.76256
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.23388    0.37299  -0.627    0.531
## ln_exp       0.52035    0.06302   8.257 6.79e-15 ***
## ln_fam_size  0.34694    0.07016   4.945 1.34e-06 ***
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4664 on 269 degrees of freedom
##   (13 observations deleted due to missingness)
## Multiple R-squared:  0.3611, Adjusted R-squared:  0.3564
## F-statistic: 76.03 on 2 and 269 DF,  p-value: < 2.2e-16
```

```
lm_peiping_food = lm(ln_food ~ ln_exp,peiping)
plot(ln_food ~ ln_exp, main = "Peiping Food", data=peiping)
abline(lm_peiping_food, col="blue")
```

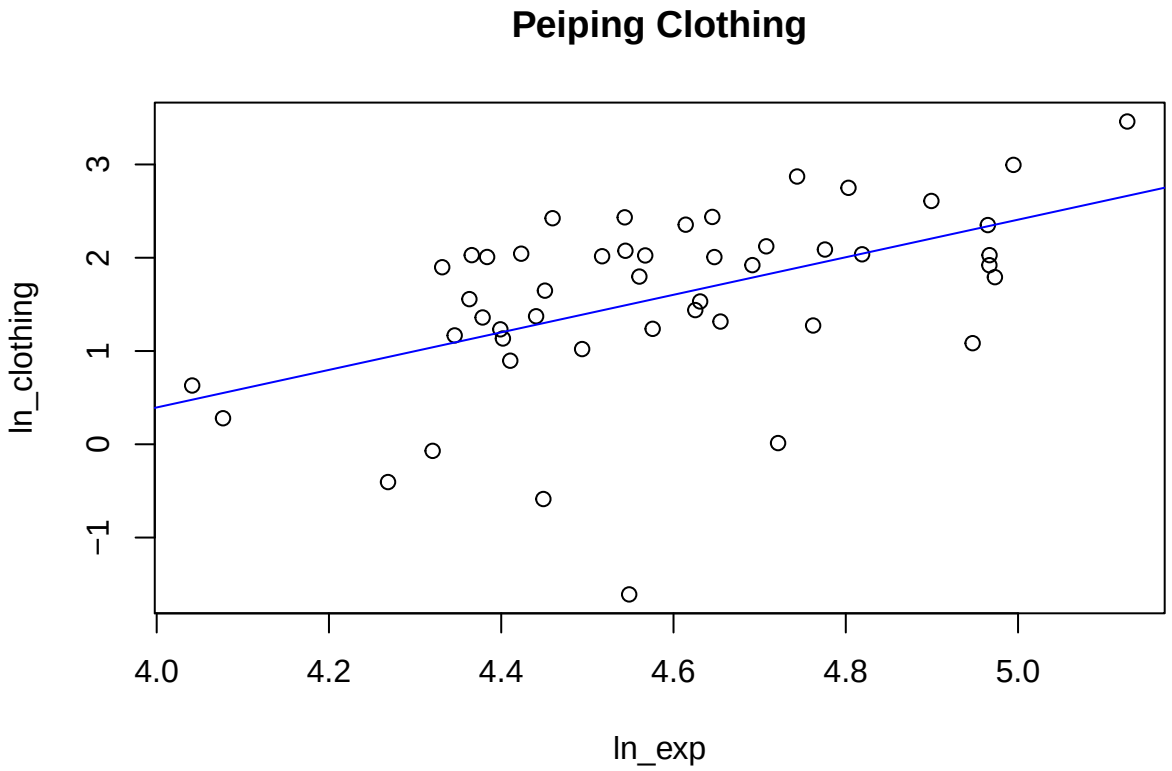



```
summary(lm_peiping_food)
```

```
##
## Call:
## lm(formula = ln_food ~ ln_exp, data = peiping)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.228476 -0.055461  0.000453  0.061277  0.177296
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.90427    0.25035  -3.612 0.000749 ***
## ln_exp       1.12063    0.05446  20.576  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.09075 on 46 degrees of freedom
## Multiple R-squared:  0.902,  Adjusted R-squared:  0.8999
```

```
## F-statistic: 423.4 on 1 and 46 DF,  p-value: < 2.2e-16
```

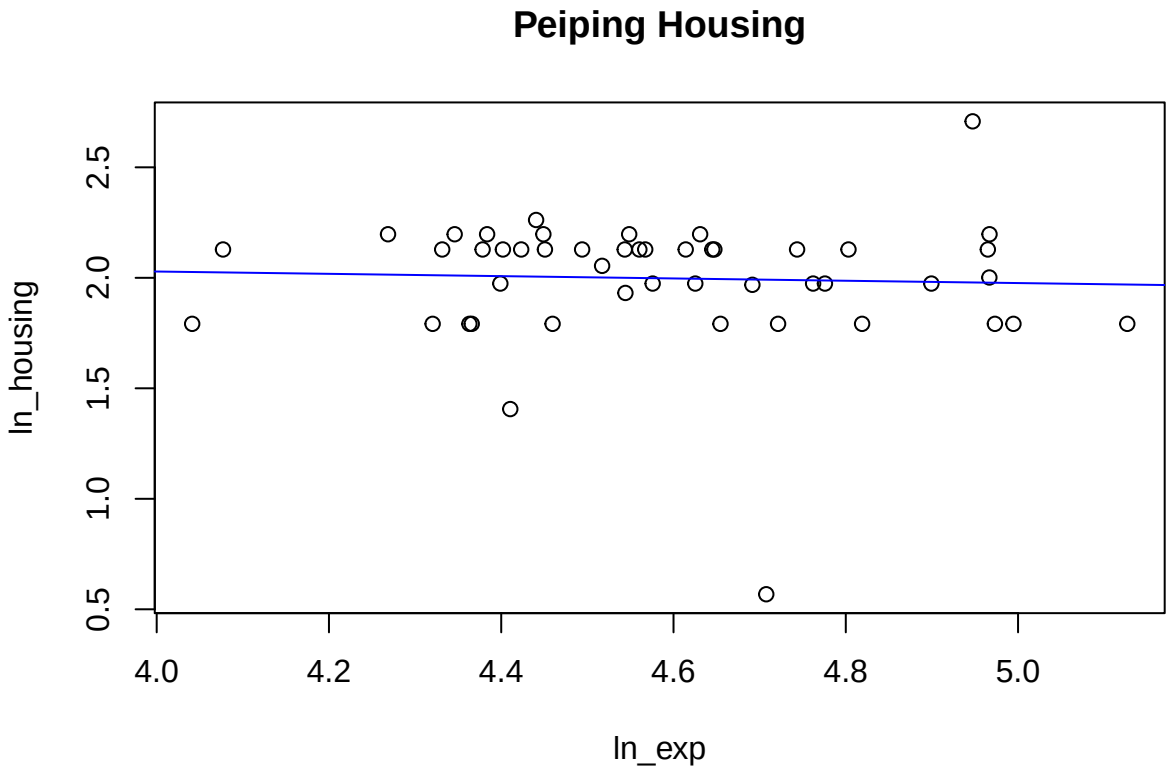
```
lm_peiping_clothing = lm(ln_clothing ~ ln_exp,peiping)
plot(ln_clothing ~ ln_exp, main = "Peiping Clothing", data=peiping)
abline(lm_peiping_clothing, col="blue")
```




```
summary(lm_peiping_clothing)
```

```
##
## Call:
## lm(formula = ln_clothing ~ ln_exp, data = peiping)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.1086 -0.3184  0.1326  0.5880  1.1038
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -7.6577     2.3384  -3.275  0.00201 **
## ln_exp        2.0131     0.5087   3.957  0.00026 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.8476 on 46 degrees of freedom
## Multiple R-squared:  0.254,  Adjusted R-squared:  0.2378
## F-statistic: 15.66 on 1 and 46 DF,  p-value: 0.0002603
```

```
plot(ln_housing ~ ln_exp, main = "Peiping Housing", data=peiping)
abline(lm_peiping_housing, col="blue")
```




```
summary(lm_peiping_housing)
```

```
##
## Call:
## lm(formula = ln_housing ~ ln_exp, data = peiping)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.4233 -0.1796  0.1105  0.1348  0.7290
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  2.23708    0.81250   2.753  0.00842 **
## ln_exp      -0.05216    0.17676  -0.295  0.76923
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2945 on 46 degrees of freedom
## Multiple R-squared:  0.00189,    Adjusted R-squared:  -0.01981
## F-statistic: 0.0871 on 1 and 46 DF,  p-value: 0.7692
```