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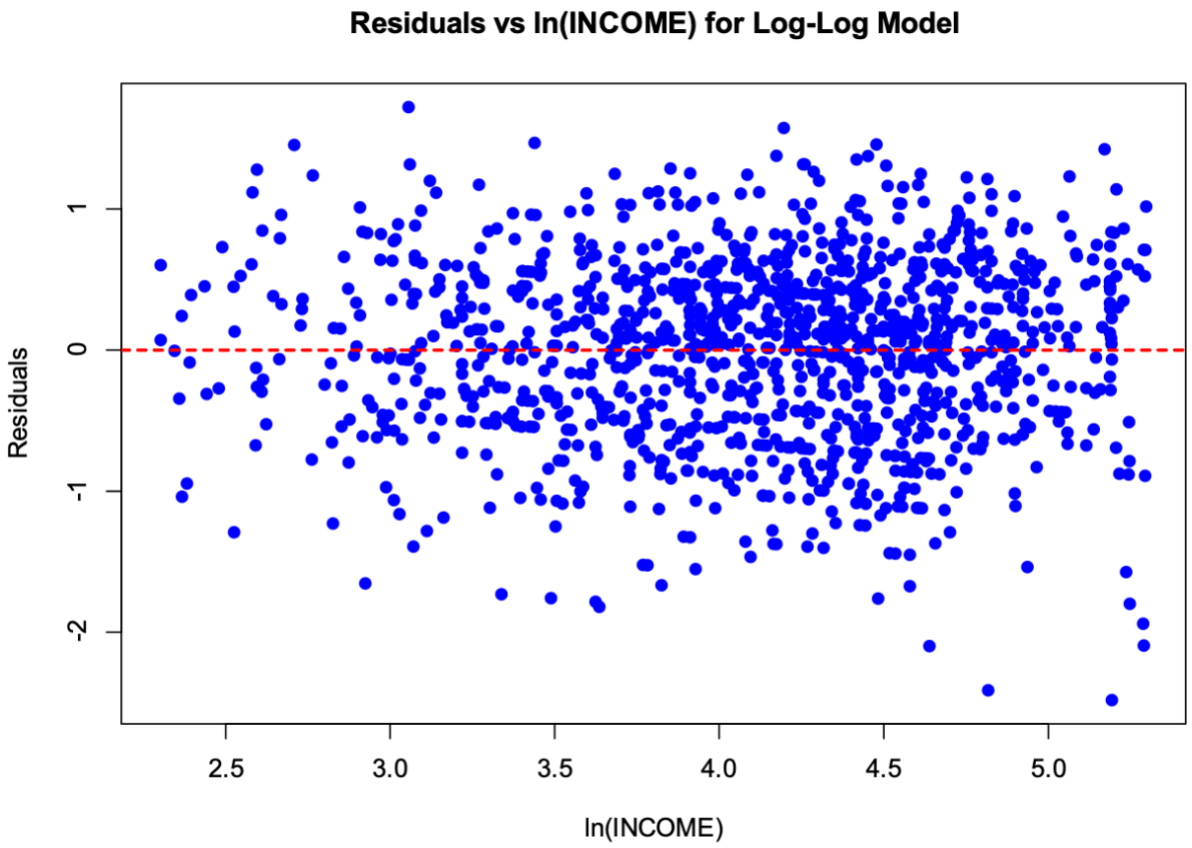
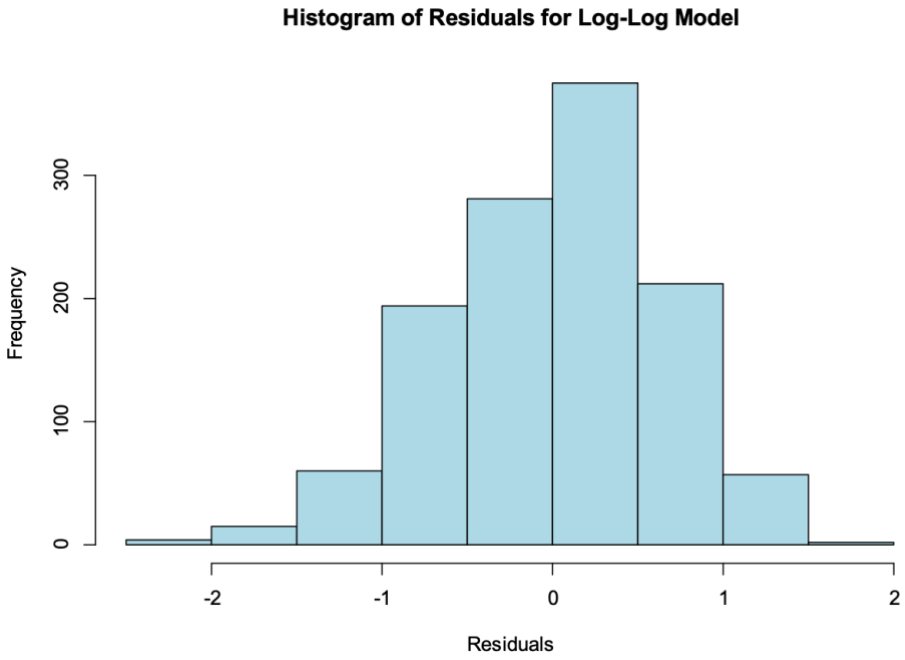
HW0317

Question 29

g.





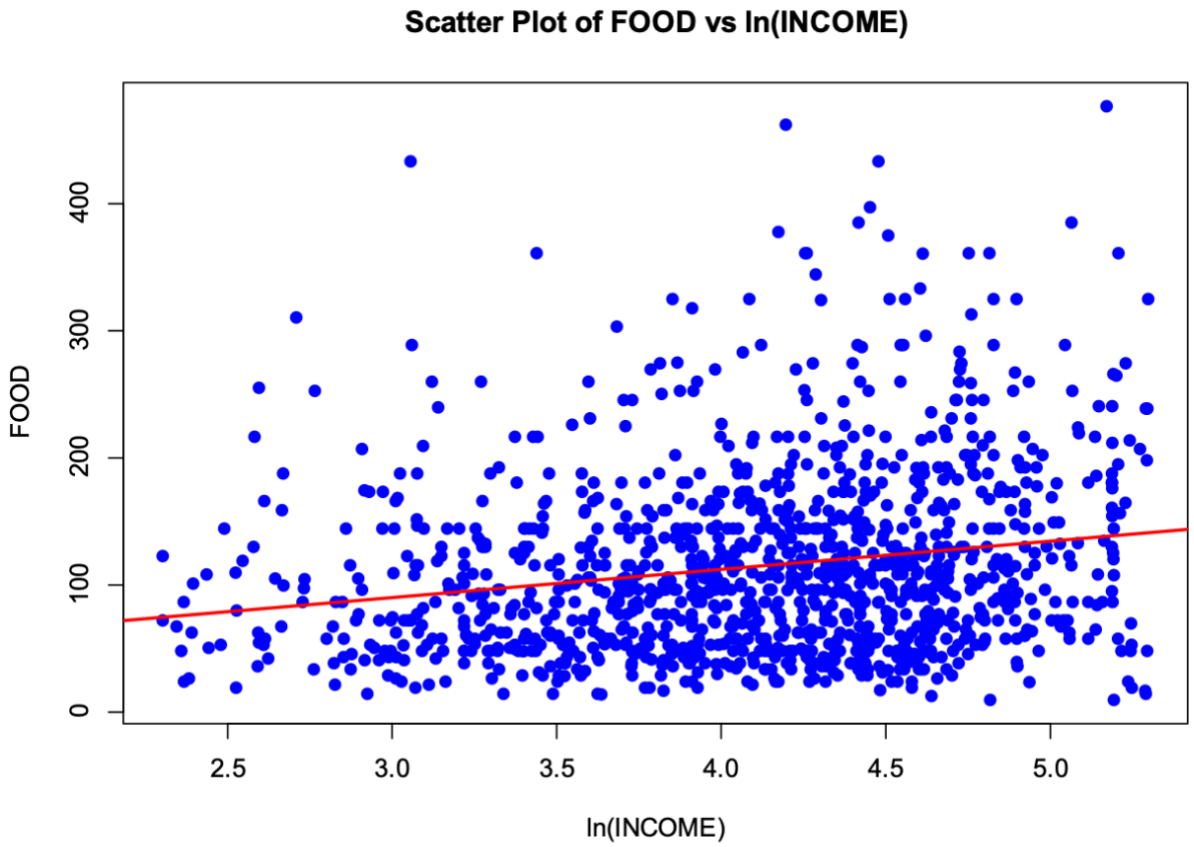

```
    Jarque Bera Test

data:  log_log_resid
X-squared = 25.85, df = 2, p-value = 2.436e-06
```

The scatters are quite random and no pattern.

The Jarque Bera Test results suggest that null hypothesis is rejected.

h.

```
> print(model_comparison)
                      Model         R2
1                    Linear 0.04228120
2                Linear-Log 0.03799984
3 Log-Log (Generalized R²) 0.03965161
```



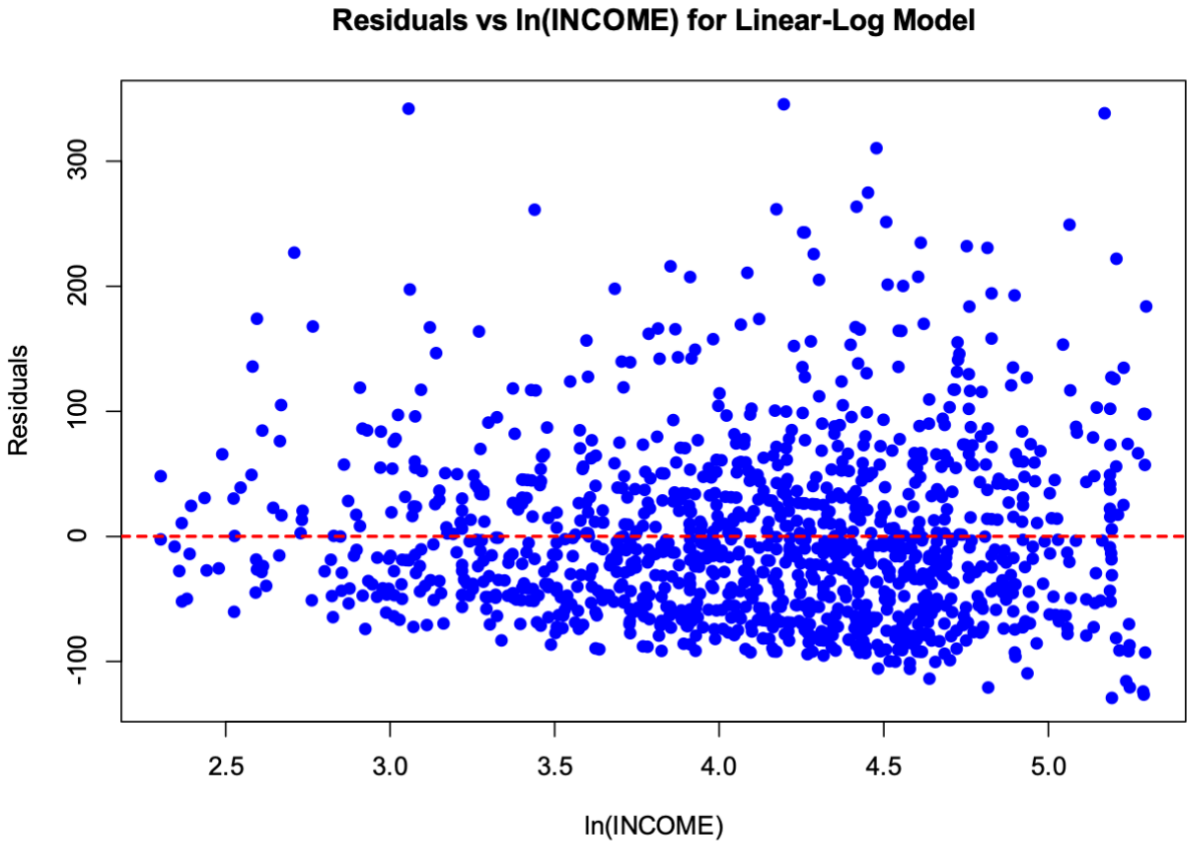
Based on the result R2 of linear is slightly higher than others; therefore, it is better fit.

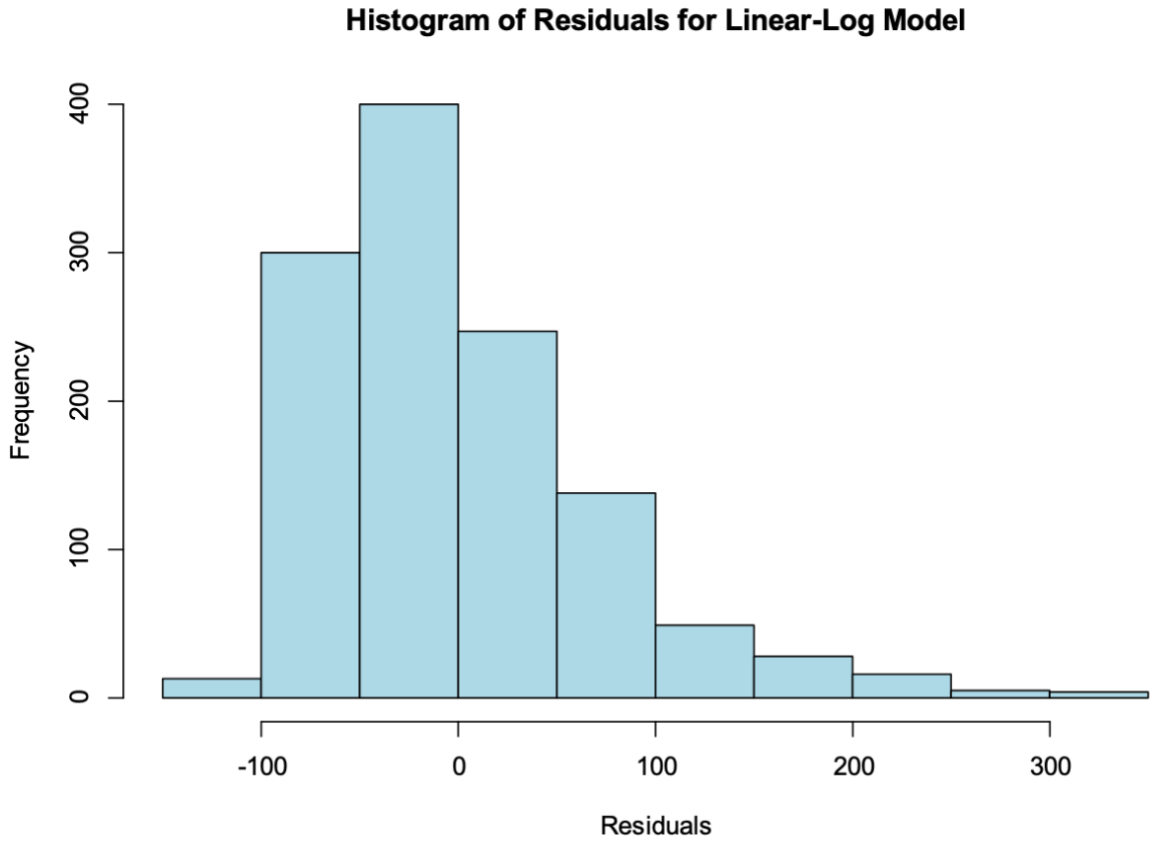
i.

```
> print(results_lin_log)
  Income Fitted_Food Elasticity         SE  CI_Lower  CI_Upper
1     19    88.89788  0.2495828 0.04706296 0.1572478 0.3419178
2     65   116.18722  0.1909624 0.02755151 0.1369078 0.2450169
3    160   136.17332  0.1629349 0.02005756 0.1235830 0.2022867
```

Based on the results the elasticity of income at 65 is quite similar to Log_log model as well as linear one. However, it is dissimilar to linear one at low and high level of income. The model choice could affect the estimated elasticity at different range of income.

j.


Residuals vs ln(INCOME) for Linear-Log Model
Residuals
300
200
100
0
-100
2.5
3.0
3.5
4.0
4.5
5.0
ln(INCOME)




```
    Jarque Bera Test

data:  lin_log_resid
X-squared = 628.07, df = 2, p-value < 2.2e-16
```

The results support right skewed distribution of residuals where most of residuals becomes negative, and just several ones being positive ones. To confirm it again, the Jarque Bera test results show that there is insignificant statistically and reject the null hypothesis of normality.

k.

I prefer log_log model which income elasticity is constant for all income levels. The residual scatters most random. Therefore, I choose log_log model.