Appendix M

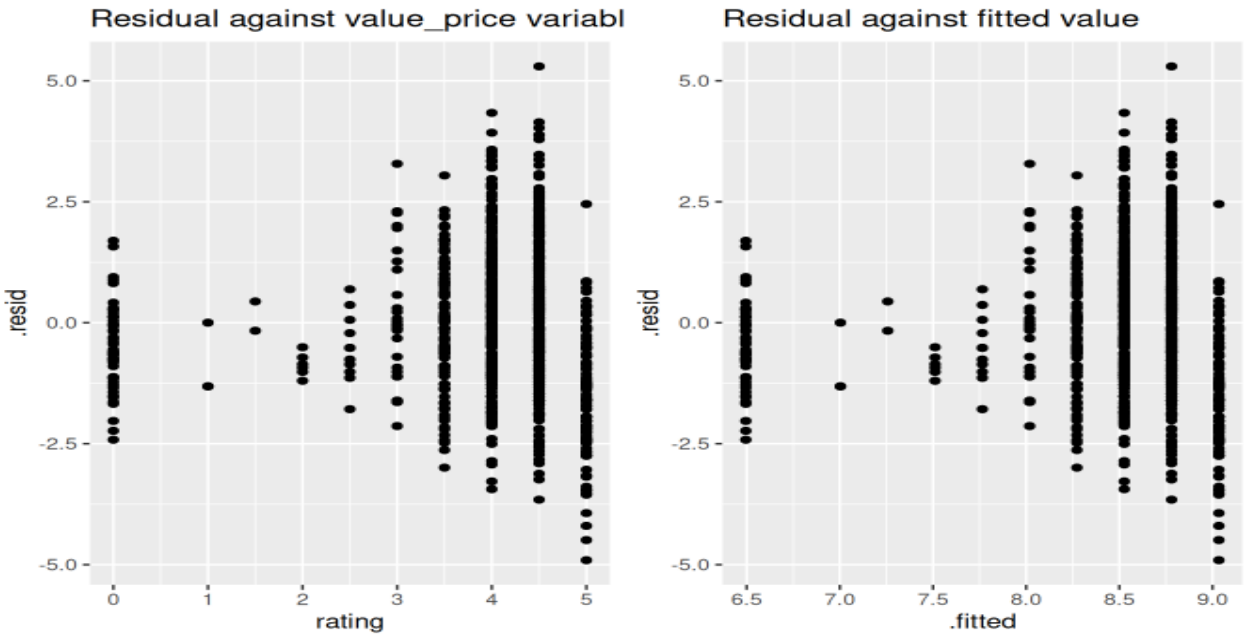
L.I.N.E. assumptions analysis for rating variable

Linearity Assumption for rating variable:

Both plots, Residual vs. predictor and Residual vs. fitted values, show no discernible pattern, indicating no violation of linearity assumptions. Therefore, it can be concluded that log love and rating exhibit a linear relationship, supporting linear regression techniques.

```{r}
# fit linear model love_
lm4 <- lm(log_love ~ rating, data = sephoraData)

# Augment LR for love
love_lm4_aug <- augment(love_lm4)

# plot the residuals vs the predictors
p1 <- ggplot(data = love_lm4_aug, aes(y = .resid, x = rating)) +
      geom_point() +
      ggtitle("Residual against value_price variable")

# plot the residuals vs the fitted values
p2 <- ggplot(data = love_lm4_aug, aes(y = .resid,
      x = .fitted)) +
      geom_point() +
      ggtitle("Residual against fitted value")

plot_grid(p1, p2, nrow = 1)
```

Plots of residual vs. Log price and plot residual vs. Fitted value

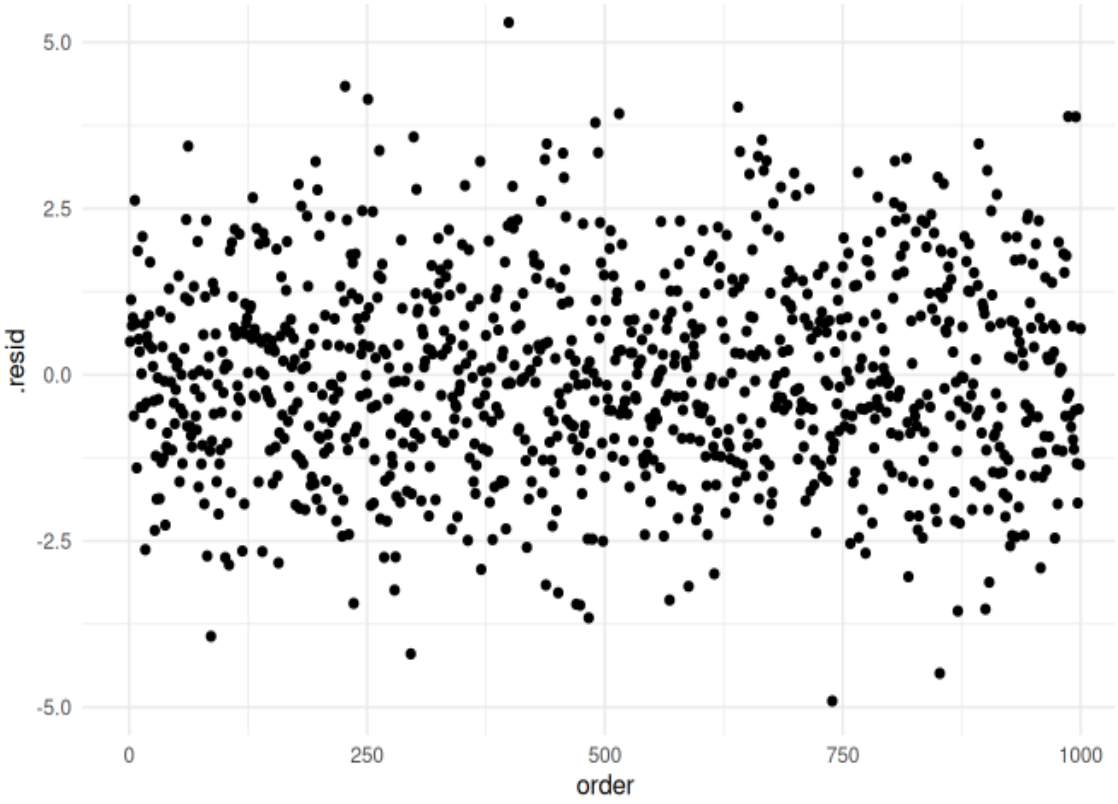


Independence assumption for rating variable:

The residual vs. order plot displays a scattered distribution of residuals, suggesting no discernible pattern or trend. This random sequence sustains the independence assumption between log love response and rating predictor, indicating no violation of this assumption in the regression model.

```{r}
# Plot residual vs. time or order
love_lm4_aug <- love_lm4_aug %>%
      mutate(order = seq(1:dim(love_lm3_aug)[1]))

ggplot(love_lm4_aug, aes(x = order, y = .resid)) +
      geom_point() +
      theme_minimal() +
      ggtitle("redisual vs. order")
```

Residual vs order for rating variable


5.0
2.5
0.0
-2.5
-5.0
.resid
0
250
500
750
1000
order