**Equal variance assumption for log price variable:**

The equal variance assumption test results for the Log Price predictor indicate that the error variance is constant. The scatterplot of Log Love vs. Log Price and the residual vs. predictor plot show a random cloud pattern, suggesting that the variance of errors does not vary systematically with the predictor. Furthermore, Levene's statistical test, used to assess the equality of variances across different groups, yielded a p-value of 0.789. This p-value indicates no significant difference in variances across groups, failing to reject the null hypothesis (Ho). Therefore, the assumption of equal variance is sustained for the Log Price predictor. This suggests that the variability in the errors remains consistent across different levels of Log Price, supporting the validity of using Log Price as a predictor in regression analysis with Log Love as the response variable.

```{r}
# SLR plot for value_price
p6 <- ggplot(data = love_lm2_aug, aes(x = log_price, y = log_love)) +
 geom_point() +
#without CI band
geom_smooth(method = "lm", se = FALSE) +
ggtitle("Price Vs. log_price")

 # plot the residuals vs the predictors
p7 <- ggplot(data = love_lm2_aug, aes(y = .resid, x = log_price)) +
geom_point() +
ggtitle("Residual plot against log_price")

plot_grid(p6, p7, nrow = 1)
```

Plots of log Love vs. Log price and plot residual vs. Log price

Price Vs. log_price | Residual plot against log_price
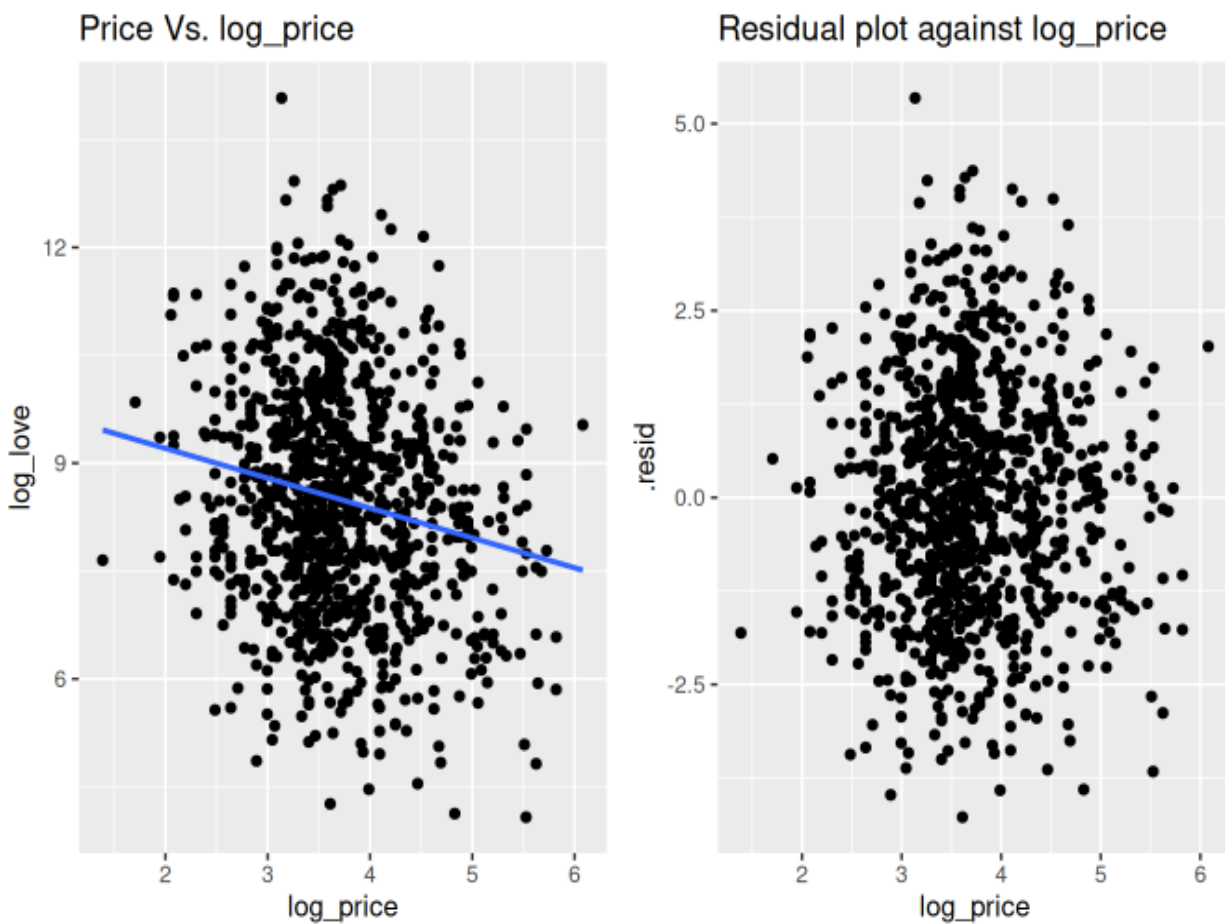
Levene's Test for Homogeneity of Variance

Ho: error variance is constant

HA: error variance is not constant

```{r}
# get the median
median <- median(love_lm2_aug$log_price)

print(paste("median of logprice : ", median))
```
```
[1] "median of logprice : 3.61091791264422"
```

```{r}
#split the data into two groups
love_lm2_aug <- love_lm2_aug %>%
    mutate(group = factor(if_else(log_price < median, 1, 2)))
```

```
# Checking the number of observations are in each group
love_lm2_aug %>%
count(group)
```
```
  # A tibble: 2 × 2
    group      n
    <fct> <int>
  1 1       494
  2 2       506
```

```{r}
# Levene's Test for Homogeneity of Variance
leveneTest(y = love_lm2_aug$.resid, group = love_lm2_aug$group) #from car
package
```
```
 Levene's Test for Homogeneity of Variance (center = median)
        Df F value Pr(>F)
 group    1  0.5528 0.4574
        998
```

Because p-value > 0.05, we fail to reject and conclude that the error variance is constant for all x

values, so there is no longer a significant issue with the normality or equal variance assumptions.