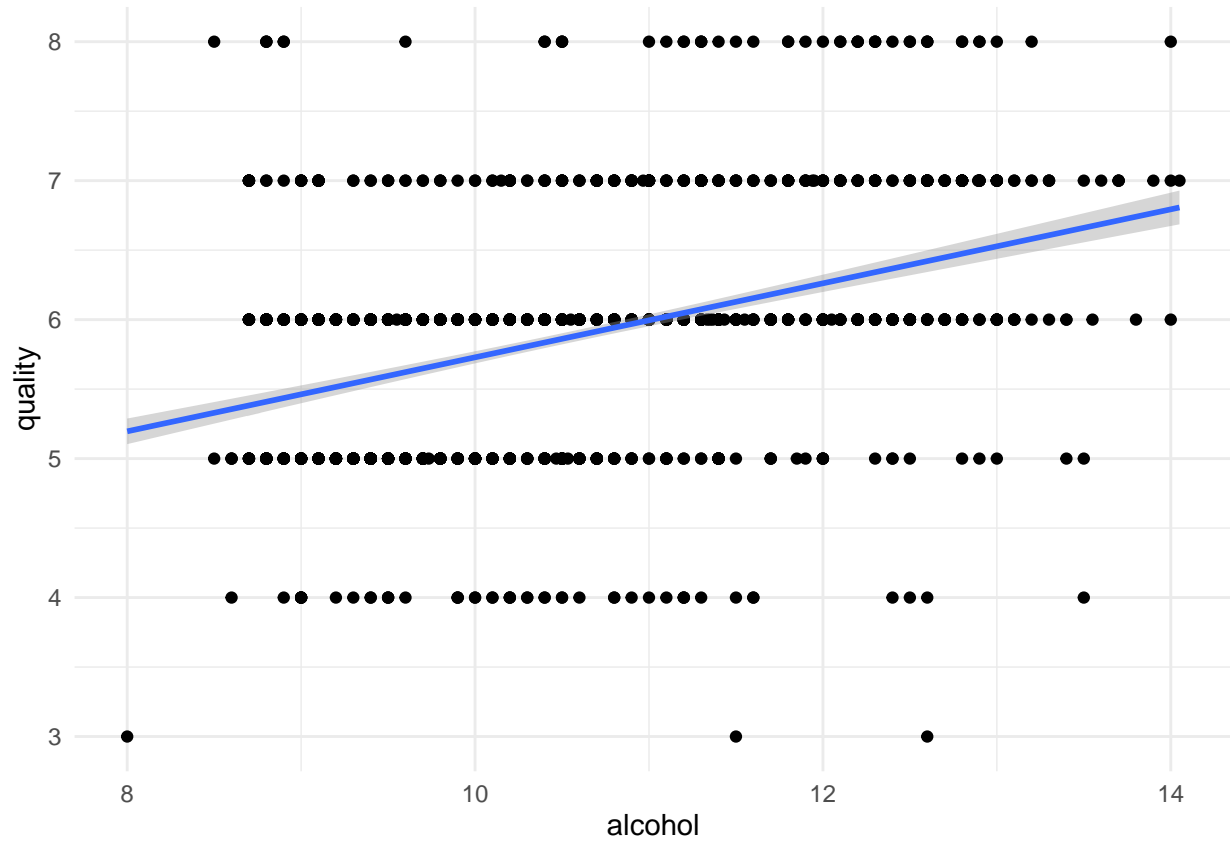
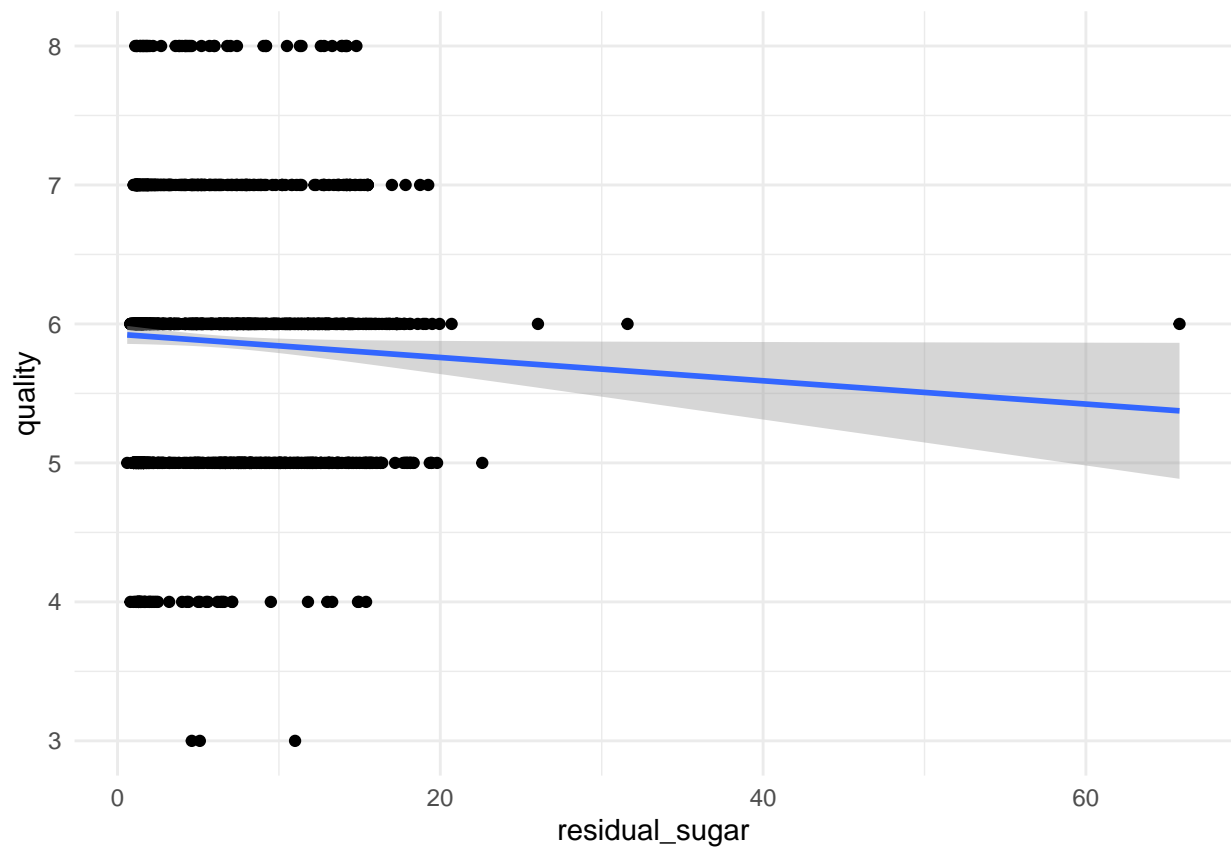
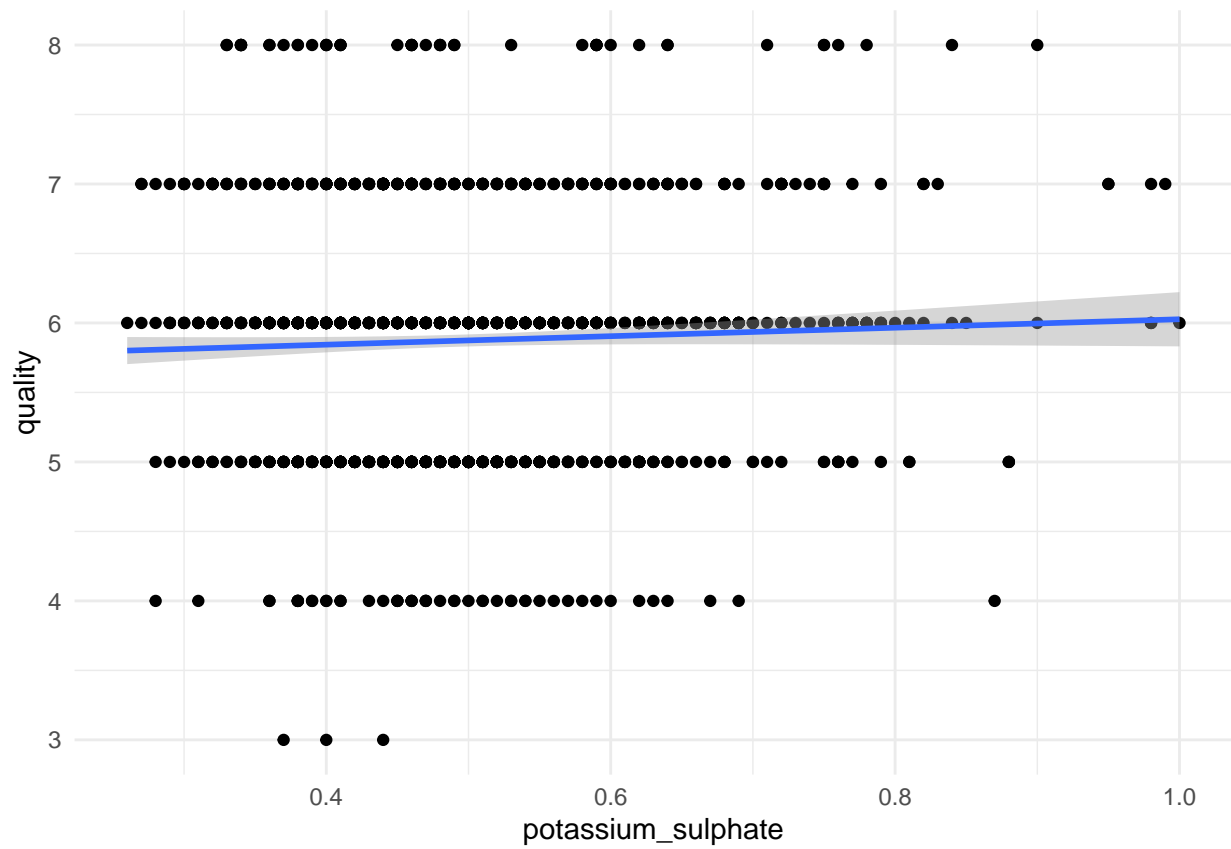
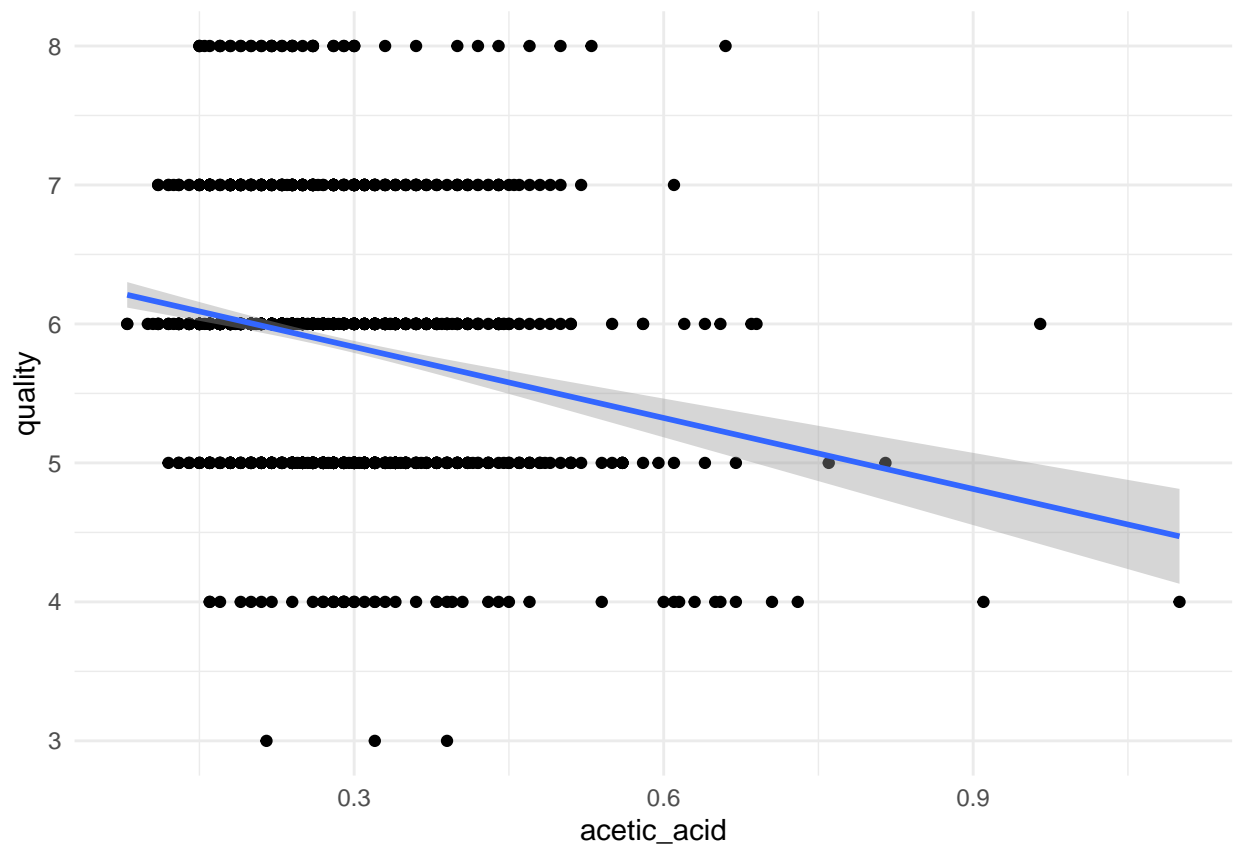
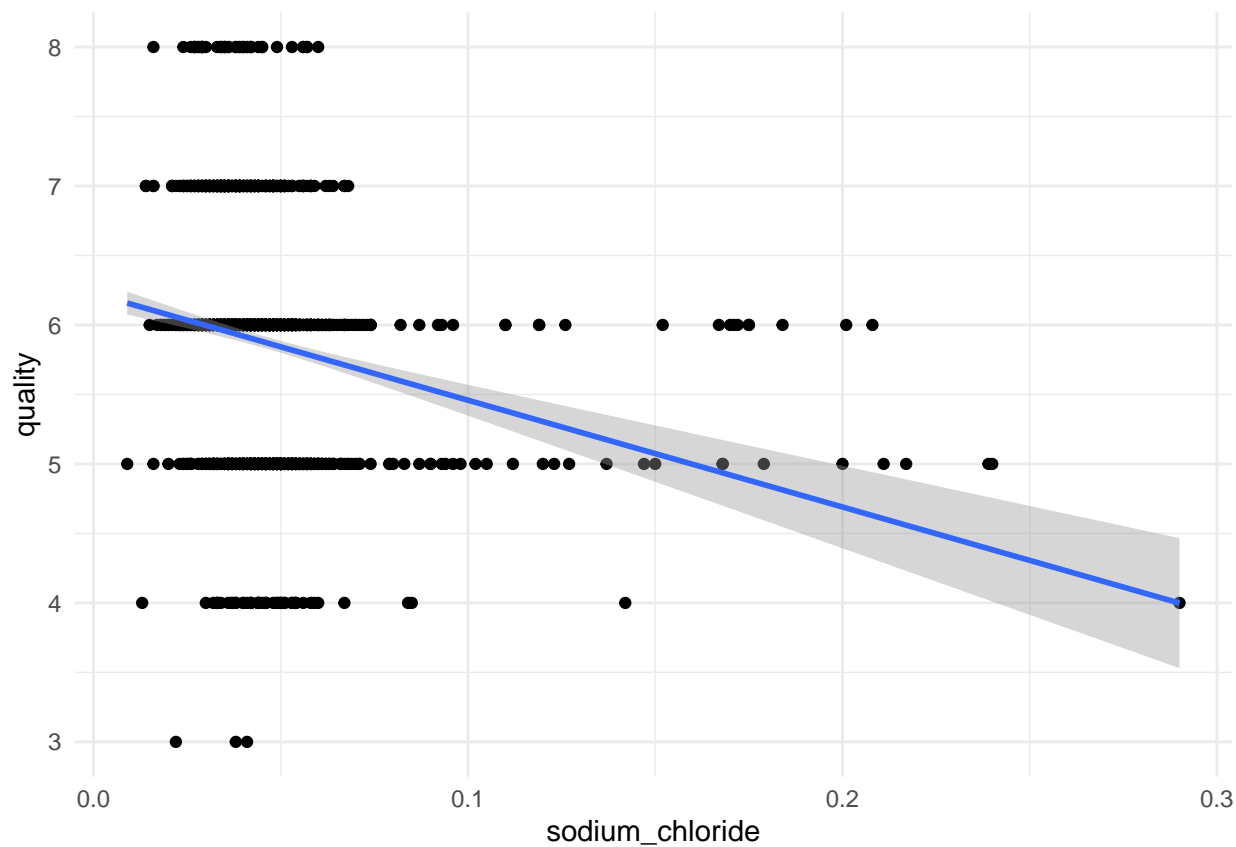
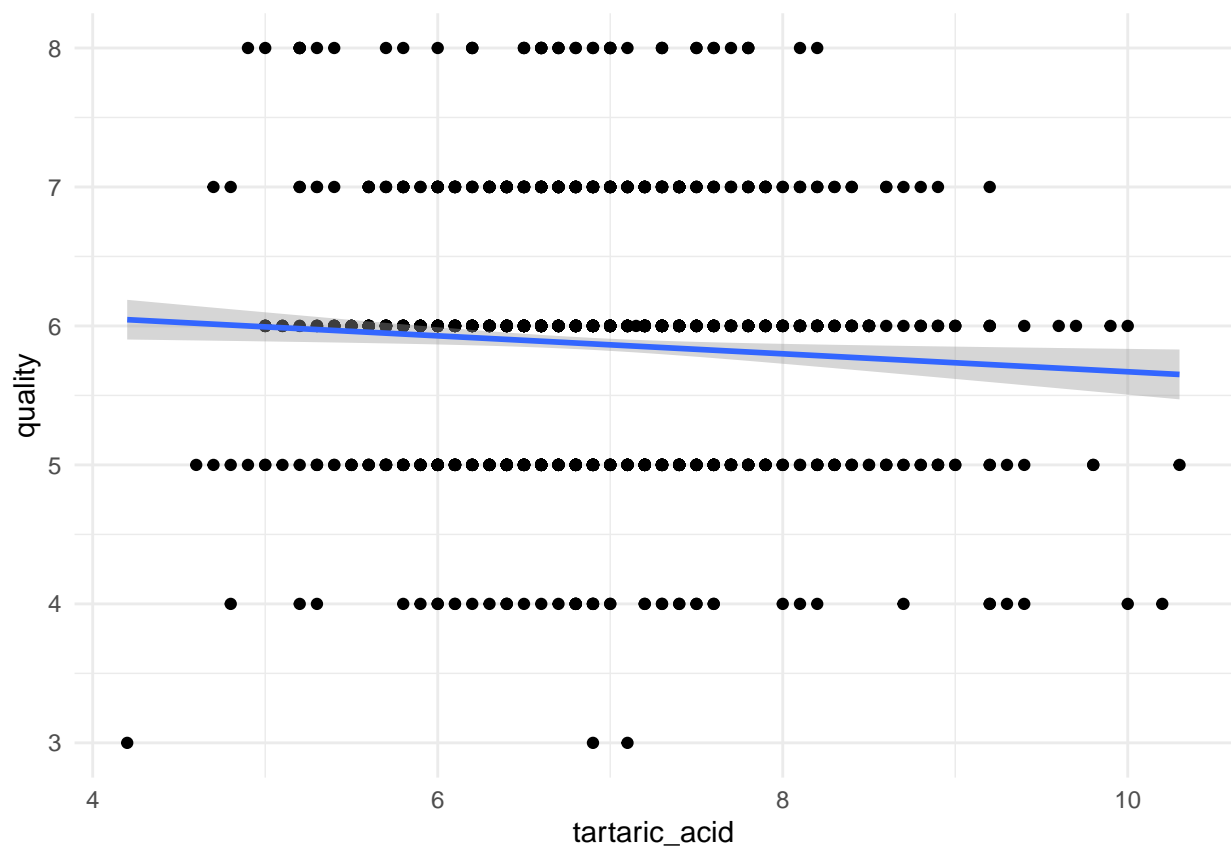
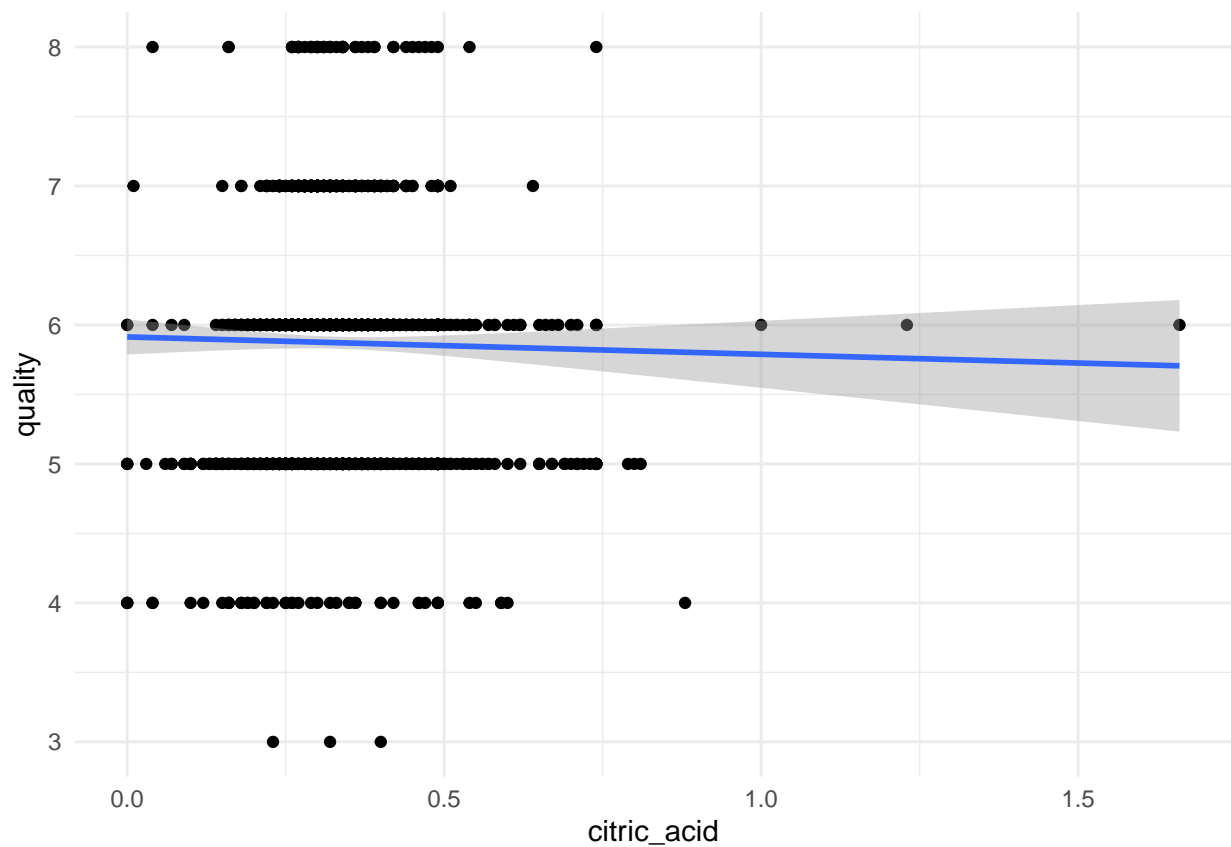


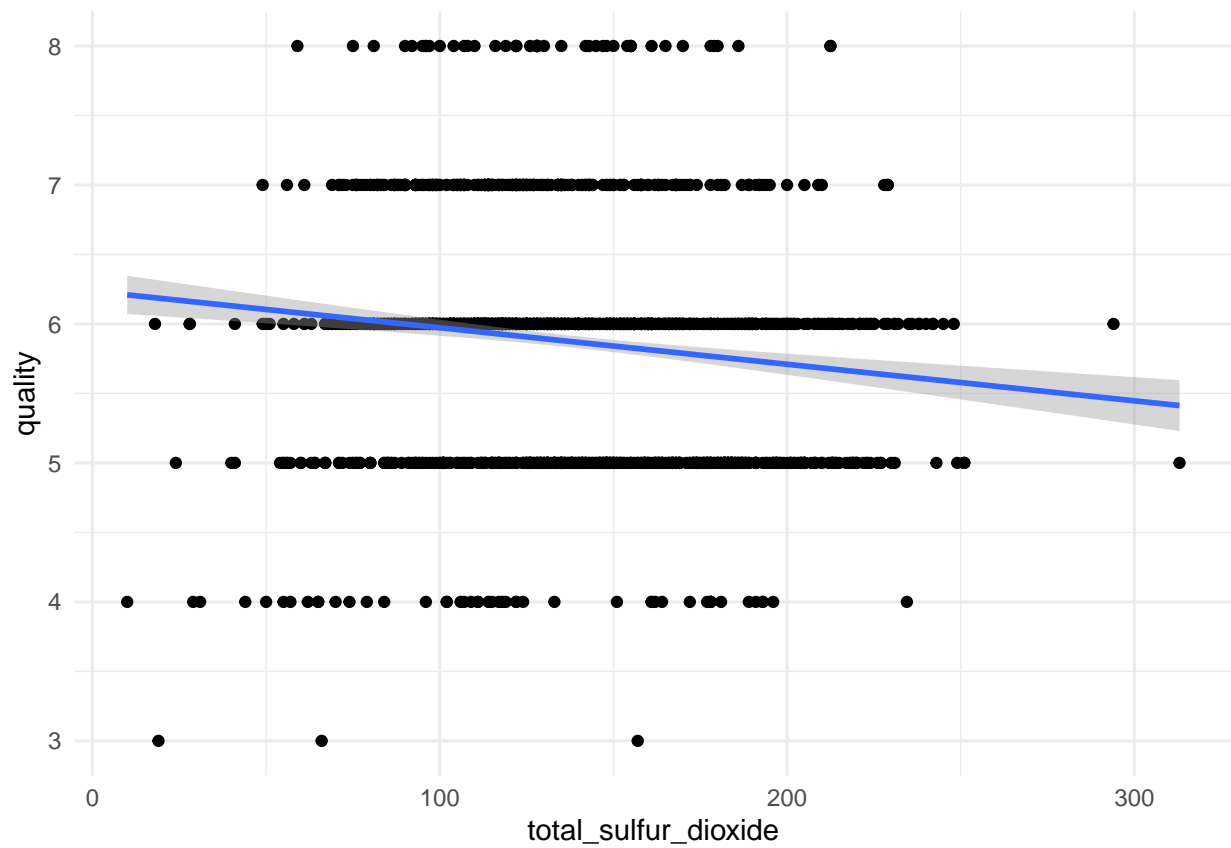
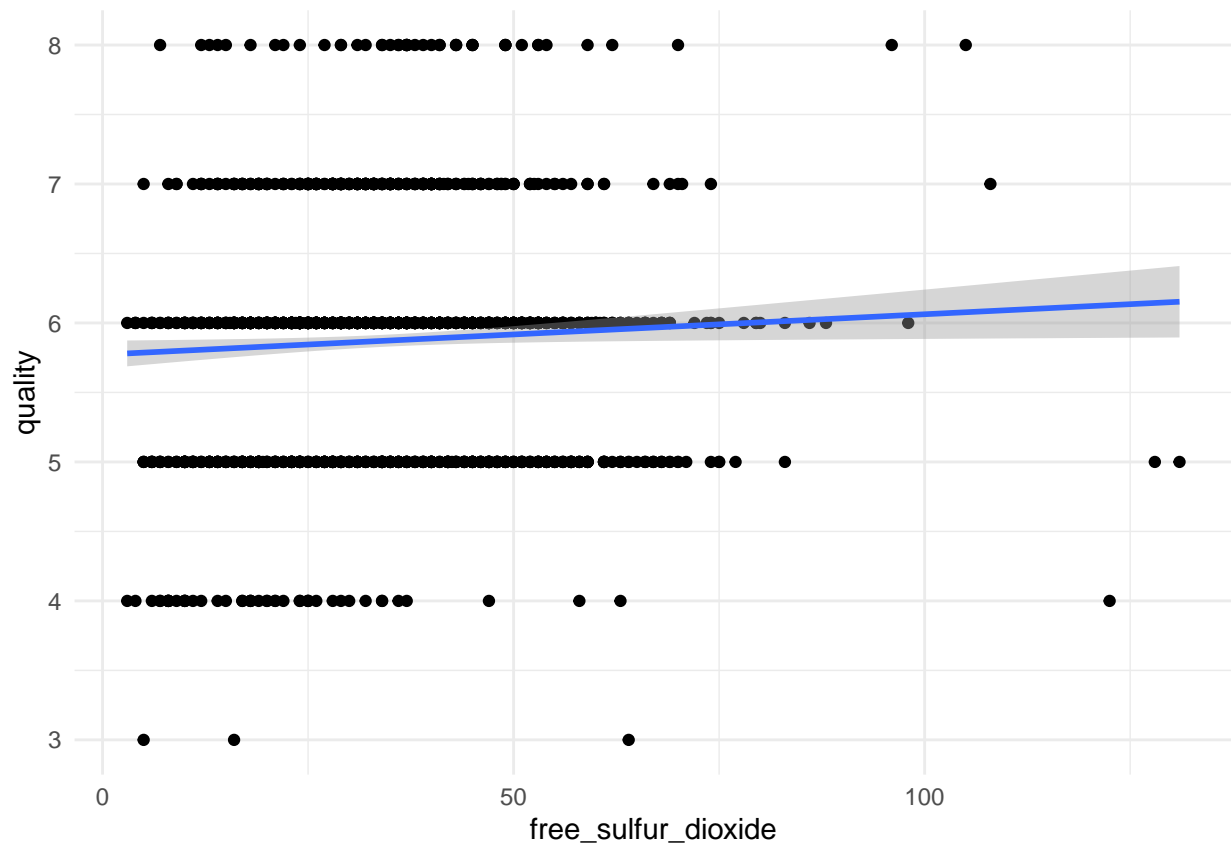
Initial Exploration, Modeling, and Visualizations

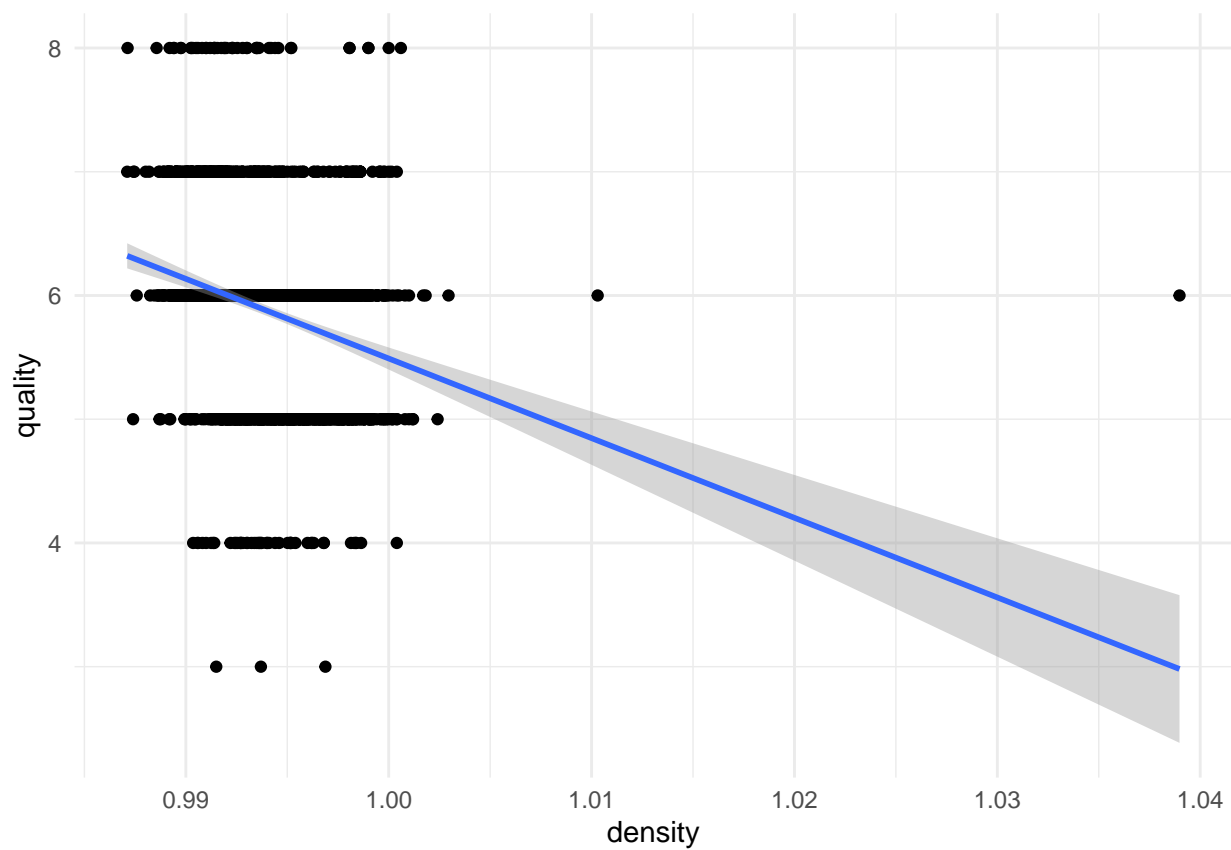
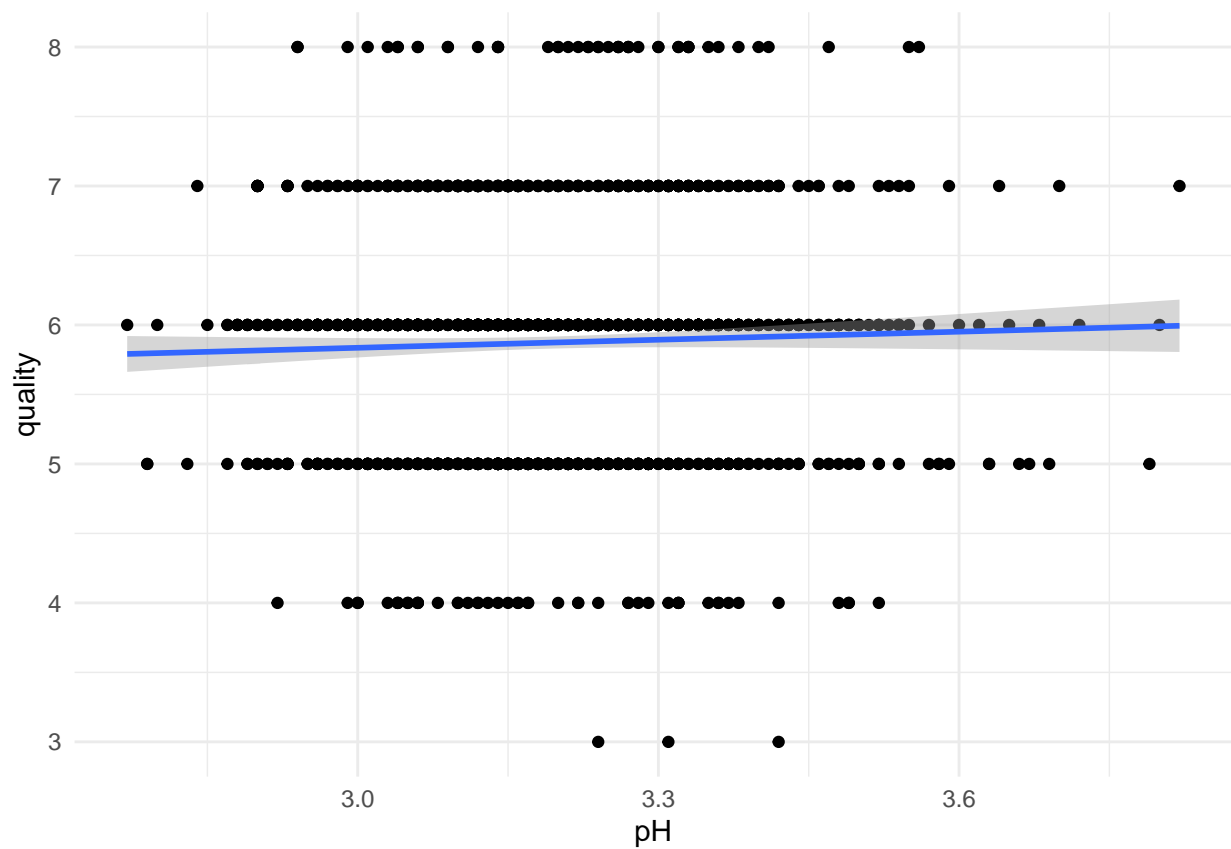












regression with potassium sulphate as primary X variable

Table 1: Estimated Regressions

| | Output Variable: Wine Quality Score | | | |
|----------------------|-------------------------------------|--------------------|---------------------|--------------------|
| | (1) | (2) | (3) | (4) |
| potassium_sulphate | 0.30 (0.20) | 0.49** (0.17) | 0.64*** (0.18) | 0.46** (0.17) |
| alcohol | | 0.33*** (0.02) | 0.25*** (0.04) | 0.34*** (0.02) |
| sodium_chloride | | -1.14 (0.80) | -0.93 (0.82) | -1.19 (0.80) |
| acetic_acid | | -2.19*** (0.21) | -2.12*** (0.20) | -2.21*** (0.21) |
| citric_acid | | -0.25 (0.16) | -0.25 (0.16) | -0.28 (0.16) |
| tartaric_acid | | -0.03 (0.02) | 0.02 (0.03) | -0.03 (0.02) |
| residual_sugar | | 0.03*** (0.004) | 0.06*** (0.01) | 0.03*** (0.004) |
| total_sulfur_dioxide | | | 0.001* (0.001) | 0.001 (0.001) |
| density | | | -81.26** (29.59) | |
| Constant | 5.72*** (0.10) | 2.90*** (0.31) | 83.73** (29.54) | 2.70*** (0.32) |
| Observations | 1,470 | 1,470 | 1,470 | 1,470 |
| R ² | 0.002 | 0.24 | 0.25 | 0.24 |
| Residual Std. Error | 0.85 (df = 1468) | 0.74 (df = 1462) | 0.74 (df = 1460) | 0.74 (df = 1461) |

Note:

*HC*₁ robust standard errors in parentheses.

regression with sodium_chloride as primary X variable

regression with acetic_acid as primary X variable

Equation for linear regression:

$$\widehat{quality} = \beta_0 + \beta_1 \cdot (\text{insert variable}) + \mathbf{Z}\gamma$$

Table 2: Estimated Regressions

| | Output Variable: Wine Quality Score | | | |
|----------------------|-------------------------------------|--------------------|---------------------|--------------------|
| | (1) | (2) | (3) | (4) |
| sodium_chloride | -7.68*** (0.92) | -1.14 (0.80) | -0.93 (0.82) | -1.19 (0.80) |
| acetic_acid | | -2.19*** (0.21) | -2.12*** (0.20) | -2.21*** (0.21) |
| potassium_sulphate | | 0.49** (0.17) | 0.64*** (0.18) | 0.46** (0.17) |
| alcohol | | 0.33*** (0.02) | 0.25*** (0.04) | 0.34*** (0.02) |
| citric_acid | | -0.25 (0.16) | -0.25 (0.16) | -0.28 (0.16) |
| tartaric_acid | | -0.03 (0.02) | 0.02 (0.03) | -0.03 (0.02) |
| residual_sugar | | 0.03*** (0.004) | 0.06*** (0.01) | 0.03*** (0.004) |
| total_sulfur_dioxide | | | 0.001* (0.001) | 0.001 (0.001) |
| density | | | -81.26** (29.59) | |
| Constant | 6.23*** (0.05) | 2.90*** (0.31) | 83.73** (29.54) | 2.70*** (0.32) |
| Observations | 1,470 | 1,470 | 1,470 | 1,470 |
| R ² | 0.04 | 0.24 | 0.25 | 0.24 |
| Residual Std. Error | 0.83 (df = 1468) | 0.74 (df = 1462) | 0.74 (df = 1460) | 0.74 (df = 1461) |

*Note:**HC*₁ robust standard errors in parentheses.

Table 3: Estimated Regressions

| | Output Variable: Wine Quality Score | | | |
|------------------------------------|-------------------------------------|--------------------|---------------------|--------------------|
| | (1) | (2) | (3) | (4) |
| Acetic acid (g/dm^3) | -1.70*** (0.23) | -2.19*** (0.21) | -2.12*** (0.20) | -2.21*** (0.21) |
| Sodium chloride (g/dm^3) | | -1.14 (0.80) | -0.93 (0.82) | -1.19 (0.80) |
| Potassium sulphate (g/dm^3) | | 0.49** (0.17) | 0.64*** (0.18) | 0.46** (0.17) |
| Alcohol (<i>vol.%</i>) | | 0.33*** (0.02) | 0.25*** (0.04) | 0.34*** (0.02) |
| Citric acid (g/dm^3) | | -0.25 (0.16) | -0.25 (0.16) | -0.28 (0.16) |
| Tartaric acid (g/dm^3) | | -0.03 (0.02) | 0.02 (0.03) | -0.03 (0.02) |
| Residual sugar (g/dm^3) | | 0.03*** (0.004) | 0.06*** (0.01) | 0.03*** (0.004) |
| Total sulfur dioxide (mg/dm^3) | | | 0.001* (0.001) | 0.001 (0.001) |
| Density (g/cm^3) | | | -81.26** (29.59) | |
| Constant | 6.35*** (0.06) | 2.90*** (0.31) | 83.73** (29.54) | 2.70*** (0.32) |
| Observations | 1,470 | 1,470 | 1,470 | 1,470 |
| R ² | 0.04 | 0.24 | 0.25 | 0.24 |
| Residual Std. Error | 0.83 (df = 1468) | 0.74 (df = 1462) | 0.74 (df = 1460) | 0.74 (df = 1461) |

Note:

 HC_1 robust standard errors in parentheses.