

|                      | fixed acidity | volatile acidity | citric acid | residual sugar | chlorides | free sulfur dioxide | total sulfur dioxide | density | pH    | sulphates | alcohol | quality |
|----------------------|---------------|------------------|-------------|----------------|-----------|---------------------|----------------------|---------|-------|-----------|---------|---------|
| fixed acidity        | 1.0           | -0.26            | 0.67        | 0.11           | 0.09      | -0.15               | -0.11                | 0.67    | -0.68 | 0.18      | -0.06   | 0.12    |
| volatile acidity     | -0.26         | 1.0              | -0.55       | 0.0            | 0.06      | -0.01               | 0.08                 | 0.02    | 0.23  | -0.26     | -0.2    | -0.39   |
| citric acid          | 0.67          | -0.55            | 1.0         | 0.14           | 0.2       | -0.06               | 0.04                 | 0.36    | -0.54 | 0.31      | 0.11    | 0.23    |
| residual sugar       | 0.11          | 0.0              | 0.14        | 1.0            | 0.06      | 0.19                | 0.2                  | 0.36    | -0.09 | 0.01      | 0.04    | 0.01    |
| chlorides            | 0.09          | 0.06             | 0.2         | 0.06           | 1.0       | 0.01                | 0.05                 | 0.2     | -0.27 | 0.37      | -0.22   | -0.13   |
| free sulfur dioxide  | -0.15         | -0.01            | -0.06       | 0.19           | 0.01      | 1.0                 | 0.67                 | -0.02   | 0.07  | 0.05      | -0.07   | -0.05   |
| total sulfur dioxide | -0.11         | 0.08             | 0.04        | 0.2            | 0.05      | 0.67                | 1.0                  | 0.07    | -0.07 | 0.04      | -0.21   | -0.19   |
| density              | 0.67          | 0.02             | 0.36        | 0.36           | 0.2       | -0.02               | 0.07                 | 1.0     | -0.34 | 0.15      | -0.5    | -0.17   |
| pH                   | -0.68         | 0.23             | -0.54       | -0.09          | -0.27     | 0.07                | -0.07                | -0.34   | 1.0   | -0.2      | 0.21    | -0.06   |
| sulphates            | 0.18          | -0.26            | 0.31        | 0.01           | 0.37      | 0.05                | 0.04                 | 0.15    | -0.2  | 1.0       | 0.09    | 0.25    |
| alcohol              | -0.06         | -0.2             | 0.11        | 0.04           | -0.22     | -0.07               | -0.21                | -0.5    | 0.21  | 0.09      | 1.0     | 0.48    |
| quality              | 0.12          | -0.39            | 0.23        | 0.01           | -0.13     | -0.05               | -0.19                | -0.17   | -0.06 | 0.25      | 0.48    | 1.0     |