## quality

wei he

2025-08-12

## Load libraries

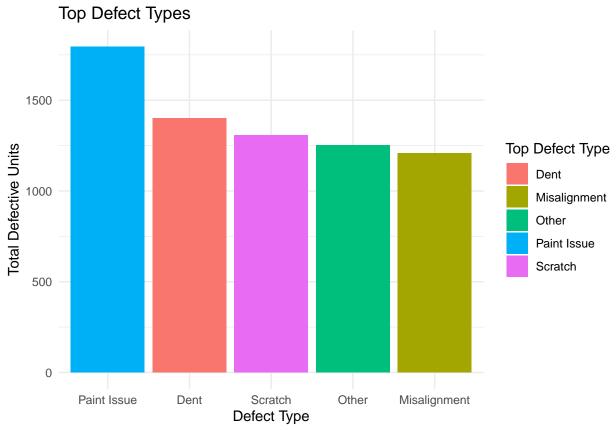
## \$ Supplier

```
library(tidyverse)
## -- Attaching core tidyverse packages ----- tidyverse 2.0.0 --
## v dplyr 1.1.2
                       v readr
                                    2.1.4
## v forcats 1.0.0
                        v stringr
                                    1.5.0
## v ggplot2 3.4.2
                        v tibble
                                    3.2.1
## v lubridate 1.9.2
                        v tidyr
                                    1.3.0
## v purrr
              1.0.1
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag() masks stats::lag()
## i Use the conflicted package (<a href="http://conflicted.r-lib.org/">http://conflicted.r-lib.org/</a>) to force all conflicts to become error
df <- read_csv("defect_rate_analysis_july2025.csv")</pre>
## Rows: 186 Columns: 9
## -- Column specification -----
## Delimiter: ","
## chr (6): Production Line, Product Type, Top Defect Type, Shift, Operator ID...
## dbl (2): Units Produced, Defective Units
## date (1): Date
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
# Quick view
glimpse(df)
## Rows: 186
## Columns: 9
## $ Date
                      <date> 2025-07-01, 2025-07-01, 2025-07-01, 2025-07-01, 202~
## $ `Production Line` <chr> "Line A", "Line A", "Line B", "Line B", "Line C", "L~
## $ `Product Type`
                      <chr> "Widget Z", "Widget X", "Widget X", "Widget Y", "Wid~
## $ `Units Produced` <dbl> 902, 1128, 1000, 1082, 1046, 960, 960, 825, 944, 107~
## $ `Defective Units` <dbl> 33, 56, 47, 33, 48, 57, 15, 38, 18, 58, 18, 44, 15, ~
## $ `Top Defect Type` <chr> "Dent", "Other", "Misalignment", "Other", "Misalignm~
                      <chr> "Day", "Night", "Day", "Night", "Day", "Night", "Day"
## $ Shift
                      <chr> "OP005", "OP007", "OP009", "OP006", "OP008", "OP007"~
## $ `Operator ID`
```

<chr> "Supplier 3", "Supplier 1", "Supplier 3", "Supplier ~

```
summary(df)
                        Production Line
                                          Product Type
                                                            Units Produced
##
        Date
                       Length:186
                                                            Min. : 801
## Min.
         :2025-07-01
                                          Length: 186
## 1st Qu.:2025-07-08
                        Class :character Class :character
                                                            1st Qu.: 917
                       Mode :character Mode :character
## Median :2025-07-16
                                                            Median:1012
## Mean :2025-07-16
                                                            Mean :1008
## 3rd Qu.:2025-07-24
                                                             3rd Qu.:1088
## Max.
          :2025-07-31
                                                            Max.
                                                                   :1198
## Defective Units Top Defect Type
                                        Shift
                                                        Operator ID
## Min. :11.00 Length:186
                                     Length: 186
                                                        Length: 186
## 1st Qu.:25.25
                  Class :character
                                     Class :character
                                                        Class : character
## Median :37.50 Mode :character
                                     Mode :character
                                                        Mode :character
## Mean :37.45
## 3rd Qu.:47.75
## Max. :79.00
##
     Supplier
## Length:186
## Class :character
## Mode :character
##
##
##
# Replace missing defect type with "None"
df <- df %>%
  mutate(`Top Defect Type` = ifelse(is.na(`Top Defect Type`), "None", `Top Defect Type`))
df %>%
  group_by(`Top Defect Type`) %>%
  summarise(Total_Defects = sum(`Defective Units`)) %>%
  arrange(desc(Total_Defects)) %>%
  ggplot(aes(x = reorder(`Top Defect Type`, -Total_Defects), y = Total_Defects, fill = `Top Defect Type
  geom_col() +
  labs(title = "Top Defect Types", x = "Defect Type", y = "Total Defective Units") +
```

theme\_minimal()



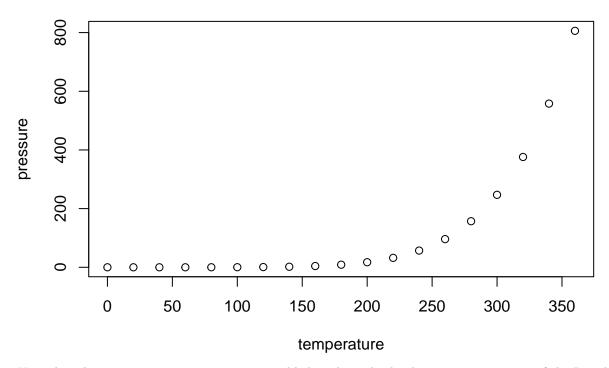
##R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the  $\mathbf{Knit}$  button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

## **Including Plots**

You can also embed plots, for example:



Note that the echo = FALSE parameter was added to the code chunk to prevent printing of the R code that generated the plot.