

```
# Load necessary library for visualization
install.packages("corrplot")
library(corrplot)
```

```
➔ Installing package into '/usr/local/lib/R/site-library'
(as 'lib' is unspecified)

corrplot 0.95 loaded
```

```
# Load and inspect the dataset
combined_dataset <- read.csv("/content/station00.csv") # Replace with your file path
cat("First few rows of the dataset:\n")
print(head(combined_dataset, 5))
```

```
➔ First few rows of the dataset:
      date_time nwp_globalirrad nwp_directirrad nwp_temperature
1 2018-08-15 16:00:00           0              0           22.78
2 2018-08-15 16:15:00           0              0           22.75
3 2018-08-15 16:30:00           0              0           22.71
4 2018-08-15 16:45:00           0              0           22.64
5 2018-08-15 17:00:00           0              0           22.57
  nwp_humidity nwp_windspeed nwp_winddirection nwp_pressure lmd_totalirrad
1          96.85          4.28          339.41        1007.27           0
2          96.91          4.30          337.27        1007.27           0
3          96.95          4.28          334.47        1007.48           0
4          97.12          4.28          331.52        1007.39           0
5          97.15          4.33          329.78        1007.09           0
  lmd_diffuseirrad lmd_temperature lmd_pressure lmd_winddirection lmd_windspeed
1              0          25.9        1006.3          353          1.1
2              0          25.9        1006.2          330          0.9
3              0          25.8        1006.3           1          1.9
4              0          25.6        1006.3          309          0.4
5              0          25.7        1006.3          335          1.6
  power
1     0
2     0
3     0
4     0
5     0
```

```
# Select columns 2 to 14 (2-13 for features, 14 as target 'power')
selected_data <- combined_dataset[, 2:15]
```

```
# Calculate the correlation matrix for the selected columns
cor_matrix <- cor(selected_data, use = "complete.obs")
```

```
# Display only correlations between columns 2-13 and the target column (14 - 'power')
cor_with_power <- cor_matrix[1:13, 14, drop = FALSE] # Only select correlations with 'power'
```

```
# Print the correlation values to examine the relationship numerically
cat("Correlation of each feature with power:\n")
print(cor_with_power)
```

```
➔ Correlation of each feature with power:
      power
nwp_globalirrad 0.92626824
nwp_directirrad 0.92152934
nwp_temperature 0.43025792
nwp_humidity    -0.37527281
nwp_windspeed   0.20509488
nwp_winddirection 0.01248865
nwp_pressure    -0.15798635
lmd_totalirrad  0.97777161
lmd_diffuseirrad 0.84156643
lmd_temperature 0.37912426
lmd_pressure    -0.17831318
lmd_winddirection 0.02242567
lmd_windspeed   0.38351396
```

```
# Visualize the correlation matrix with focus on the power relationship
corrplot(cor_matrix, method = "color", type = "upper", tl.col = "black", tl.cex = 0.8,
         title = "Correlation Heatmap of Features with Power", mar = c(0, 0, 2, 0))
# Highlight correlations with 'power' by displaying them in the plot title
```



Correlation Heatmap of Features with Power

