

# Correlations and Reshaping Data: Takeaways



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## Syntax

### RESHAPING DATA FOR VISUALIZATION

- Reshaping a dataframe so that variable names are values of a new variables:

```
combined_socio_longer <- combined %>%  
  pivot_longer(cols = c(frl_percent, ell_percent, sped_percent),  
               names_to = "socio_indicator",  
               values_to = "percent")
```

- Reshaping a dataframe so that a variable values are variable names of a new variables:

```
combined_socio_wider <- combined %>%  
  pivot_wider(names_from = socio_indicator,  
              values_from = percent)
```

### CALCULATING PEARSON'S CORRELATION COEFFICIENT

- Calculating Pearson's correlation coefficient for a pair of variables:

```
cor(combined$avg_sat_score, combined$asian_per, use = "complete.obs")
```

- Creating a correlation matrix to calculate Pearson's correlation coefficient for multiple pairs of variables:

```
cor_mat <- combined %>%  
  select_if(is.numeric) %>%  
  cor(use = "pairwise.complete.obs")
```

- Converting a correlation matrix to a tibble:

```
cor_tib <- cor_mat %>%
  as_tibble(rownames = "variable")
```

- Indexing a tibble to identify moderate to strong correlations:

```
ap_score_cors <- cor_tib %>%
  select(variable, high_score_percent) %>%
  filter(high_score_percent > 0.25 | high_score_percent < -0.25)
```

## Concepts

- Reshaping data is a common task we'll need to perform as we clean and analyze data.
- Most tidyverse functions work best when data are organized according to "tidy data principles":
  - Variables in columns.
  - Observations in rows.
  - Values in cells.

- The

```
pivot_longer()
```

function takes multiple columns and collapses them into key-value pairs, duplicating all other columns as needed, so that the dataframe is "tidy."

- The

```
pivot_wider()
```

function takes two parameters (

```
names_from
```

and

```
values_from
```

) and expands

```
names_from
```

variable into distinct columns containing values from

```
values_from
```

parameter.

- Calculating correlation coefficients (Pearson's  $r$ ) allows us to measure the strength of a relationship between a pair of variables.
  - Correlation coefficients have a value between +1 and -1.
  - The closer a correlation coefficient is to zero, the weaker the relationship between the two variables is.
  - The closer a correlation coefficient is to -1 or 1, the stronger the relationship is.
  - Positive values indicate a relationship where both variables' values increase.
  - Negative values indicate a relationship where one variable decreases as another increases.
  - Values above 0.25 or below -0.25 are enough to qualify a correlation as potentially interesting and worthy of further investigation.
  - Values above 0.75 or below -0.75 indicate strong relationships.

## Resources

- [Documentation for tidyr](#)
- [Tidyr package's release changelog](#)
- [Article on Pearson's correlation coefficient](#)



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