

# Working with Missing Data: Takeaways

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## Syntax

- Replacing matching values with a single value:

```
s.mask(s == var, value_to_replace)
```

- Replacing matching values with corresponding values from a series:

```
sl.mask(s == var, series_to_replace)
```

- A function to create a null matrix

```
def plot_null_matrix(df, figsize=(18,15)):  
    # initiate the figure  
    plt.figure(figsize=figsize)  
    # create a boolean dataframe based on whether values are null  
    df_null = df.isnull()  
    # create a heatmap of the boolean dataframe  
    sns.heatmap(~df_null, cbar=False, yticklabels=False)  
    plt.show()
```

- A function to create a null correlation heatmap

```
def plot_null_correlations(df):  
    # create a correlation matrix only for columns with at least  
    # one missing value  
    cols_with_missing_vals = df.columns[df.isnull().sum() > 0]  
    missing_corr = df[cols_with_missing_vals].isnull().corr()  
    # create a triangular mask to avoid repeated values and make  
    # the plot easier to read  
    missing_corr = missing_corr.iloc[1:, :-1]  
    mask = np.triu(np.ones_like(missing_corr), k=1)  
    # plot a heatmap of the values  
    plt.figure(figsize=(20,12))  
    ax = sns.heatmap(missing_corr, vmin=-1, vmax=1,  
                     cmap='RdBu', mask=mask, annot=True)  
    # round the labels and hide labels for values near zero  
    for text in ax.texts:  
        t = float(text.get_text())  
        if -0.05 < t < 0.01:  
            text.set_text('')  
        else:  
            text.set_text(round(t, 2))  
    plt.show()
```

## Concepts

- Imputation is the process of replacing missing values with other values.

- Imputing can be a better option than simply dropping values because you retain more of your original data.
- You might find values for imputation by:
  - Deriving the value from related columns.
  - Using the most common non-null value from a column.
  - Using an placeholder for missing values.
  - Augmenting factual data (e.g. location data) using an external resource.
- Using plots can help identify patterns in missing values which can help with imputation.

## Resources

- [pandas documentation](#)