1. **Normalization/Standardization:**
    - **When to use:** Use normalization (scaling to a [0, 1] range) or standardization (scaling to have mean=0 and standard deviation=1) when your features have different scales. Many machine learning algorithms, like k-means clustering or support vector machines, perform better when the features are on a similar scale.

2. **Log Transformation:**
    - **When to use:** Log transformation is useful when your data exhibits a significant right-skew or when the relationship between variables is multiplicative rather than additive. It can help make the data more normally distributed and stabilize variance.

3. **Box-Cox Transformation:**
    - **When to use:** The Box-Cox transformation is a generalized power transformation that can be used when the data's distribution is not a good fit for the log transformation. It's particularly useful when dealing with non-constant variance and skewed data.

4. **PCA (Principal Component Analysis):**
    - **When to use:** Principal Component Analysis is used for dimensionality reduction. It's beneficial when you have a high-dimensional dataset and want to reduce the number of features while preserving as much information as possible. This can help reduce the risk of overfitting and improve model performance.

5. **One-Hot Encoding:**
    - **When to use:** Use one-hot encoding when you have categorical variables that are not ordinal. It transforms categorical variables into binary (0/1) columns, making them suitable for algorithms that require numerical input.

6. **Feature Engineering:**
    - **When to use:** Feature engineering involves creating new features from existing ones to capture important patterns or relationships in the data. You should use feature engineering when you have domain knowledge or believe that certain transformations will improve your model's performance.

7. **Text Processing (e.g., TF-IDF, Word Embeddings):**
    - **When to use:** In natural language processing (NLP) tasks, you'll often use text processing techniques like TF-IDF (Term Frequency-Inverse Document Frequency) or word embeddings (e.g., Word2Vec or GloVe) to convert text data into numerical form for modeling.

8. **Imputation:**
    - **When to use:** Imputation techniques like mean imputation, median imputation, or more advanced methods (e.g., k-Nearest Neighbors imputation) are used when you have missing data. The choice of imputation method depends on the nature of the data and the reason for missing values.

9. **Feature Scaling:**
    - **When to use:** Feature scaling techniques, such as Min-Max scaling or Z-score scaling, are used when your algorithm is sensitive to the magnitude of features. Some algorithms, like gradient descent-based optimization algorithms, perform better with scaled features.

10. **Time Series Decomposition:**
    - **When to use:** When working with time series data, you may use decomposition techniques (e.g., seasonal decomposition) to separate the time series into its trend, seasonal, and residual components. This can help in modeling and forecasting time series data.