Creates GUI Component

__init__
- Initialize component and store app_state
- Declares all the GUI component variables
- Calls **create_components**
- Calls **setup_layout**

create_widgets
- Initializes all of the GUI component variables
- Adds bindings to required GUI components
- Adds the styling arguments to GUI components

setup_layout
- Creates a row and column configuration for the GUI
- Adds all of the GUI components to itself

Creates PCA Plot During Runtime

visualize_pca
- Shows an error message and exits if the df has not been cleaned
- Calls **main.run_analysis**
- Gets the transformed data from the pca_results and converts it to a df
- Calls **get_target**
- Calls **main.create_blank_fig**
- Creates a title and x and y label for the ax
- **If a target is selected**
    - Gets unique target values
    - Assigns group target colors using plt.cm.tab10
    - Creates a scatter plot of each group using the assigned colors
    - Adds a legend to the ax
- **Else**
    - Creates a scatter plot
- Calls **main.update_figure**

get_target
- Gets the user inputted target mode
- Strips the target and sets it to lowercase
- **If none is selected as the target mode**
    - Return None
- **If bbch is selected as the target mode**
    - **If target mode is in the df**

        - Return ‘bbch’
    - **Else**
        - Show an error message and return None
- **If input specific target is selected as the target mode**
    - Gets the user specified target from the app_state
    - Shows an error message and returns None if the target is empty or whitespace
    - Shows and error message and returns None if the target is not found in the df
    - Returns the target
- **Else**
    - Shows an error message that an application error has occurred
    - Returns None

Event Handlers

toggle_target_entry

- Sets the custom target entry box to normal if the target mode is “Input Specific Target”
- Otherwise sets the target entry box to disabled

on_entry

- Saves value in widget to original_value

on_exit

- Gets the current value in the widget
- Sets the minimum value based on the attribute name
- Sets the widget to the default value if the current value is smaller than the minimum
- If the attribute is ‘pca_num’ sets the widget to the default value if it is too large
- Sets df_updated to True if the current value differs from original_value, the entry value

validate_int

- Returns True if the proposed_value is blank or a digit
- Returns False otherwise

validate_non_neg_float

- Returns True if the proposed_value is blank, ‘.’, or a number greater than 0
- Ignores exceptions
- Returns False otherwise