main Function

- Purpose of function: The main function initializes and configures the main page of the UVSim application.
- Input: page (ft.Page) - The page object associated with the main page.
- Return Value: None.
- Pre-conditions: None.
- Post-conditions: The main page of the UVSim application is initialized and configured.

EventHandler Class

- Purpose of class: The EventHandler class manages event handling for displaying output and getting user input.

display_output

- Purpose of function: Displays output.
- Input: Output value ("output").
- Return Value: None.
- Pre-conditions: None.
- Post-conditions: Output is displayed using the OutputControl instance.

get_user_input

- Purpose of function: Retrieves user input.
- Input: None.
- Return Value: User input.
- Pre-conditions: None.
- Post-conditions: User input is retrieved using the InputControl instance.

FileEditor Class

- Purpose of class: The FileEditor class is responsible for managing file editing functionality within the UVSim application.

build

- Purpose of function: Builds the UI layout for the file editor.
- Return Value: ft.Column - The column containing UI elements.
- Pre-conditions: FileEditor instance must be initialized.
- Post-conditions: The UI layout for the file editor is constructed and returned.

go_to_UVSim

- Purpose of function: Navigates to the UVSim view.
- Input: e (Event) - Event triggering the function call.
- Return Value: None.

- Pre-conditions: FileEditor instance must be initialized.
- Post-conditions: The UVSim view is displayed.

file_picker_result
- Purpose of function: Handles the result of file picking operation.
- Input: e (ft.FilePickerResultEvent) - Result event from file picker.
- Return Value: None.
- Pre-conditions: FileEditor instance must be initialized.
- Post-conditions: File path is retrieved and file content is displayed.

save_file_result
- Purpose of function: Handles the result of file saving operation.
- Input: e (ft.FilePickerResultEvent) - Result event from file saving.
- Return Value: None.
- Pre-conditions: FileEditor instance must be initialized.
- Post-conditions: File is saved to the specified path.

save_text
- Purpose of function: Saves text content to a file.
- Input: path (str) - Path to save the file, value (str) - Content to be saved.
- Return Value: None.
- Pre-conditions: FileEditor instance must be initialized.
- Post-conditions: Text content is saved to the specified file path.

open_file
- Purpose of function: Opens a file and reads its content.
- Input: user_file (str) - Path of the file to be opened.
- Return Value: str - Content of the file.
- Pre-conditions: FileEditor instance must be initialized.
- Post-conditions: File content is read and returned.

get_text_field_value
- Purpose of function: Retrieves the value of the text field.
- Return Value: str - Value of the text field.
- Pre-conditions: FileEditor instance must be initialized.
- Post-conditions: Value of the text field is returned.

- Purpose of function: Retrieves the current file path.
- Input: None.
- Return Value: Current file path.
- Pre-conditions: None.
- Post-conditions: None.

set_file_path

- Purpose of function: Sets the file path.
- Input: File path.
- Return Value: None.
- Pre-conditions: None.
- Post-conditions: File path is set.

open_file

- Purpose of function: Opens the specified file and returns its content. If the file is not found, it sets a hint text indicating that the file is not found.
- Input: File path ("user_file").
- Return Value: Content of the file.
- Pre-conditions: The file specified by "user_file" must exist and be accessible.
- Post-conditions: None.

FileHandler Class

- Purpose of class: The FileHandler class is responsible for managing file handling functionality within the UVSim application.

build

- Purpose of function: Builds the UI layout for the file handler.
- Return Value: ft.Column - The column containing UI elements.
- Pre-conditions: FileHandler instance must be initialized.
- Post-conditions: The UI layout for the file handler is constructed and returned.

save_load_file

- Purpose of function: Saves or loads a file depending on the current state.
- Input: e (Event) - Event triggering the function call.
- Return Value: None.
- Pre-conditions: FileHandler instance must be initialized.
- Post-conditions: If a file path is available, the file is saved and then loaded into the operation.

file_picker_result

- Purpose of function: Handles the result of file picking operation.
- Input: e (ft.FilePickerResultEvent) - Result event from file picker.
- Return Value: None.
- Pre-conditions: FileHandler instance must be initialized.

- Post-conditions: File path is retrieved and file content is displayed.

save_file_result
- Purpose of function: Handles the result of file saving operation.
- Input: e (ft.FilePickerResultEvent) - Result event from file saving.
- Return Value: None.
- Pre-conditions: FileHandler instance must be initialized.
- Post-conditions: File is saved to the specified path.

save_text
- Purpose of function: Saves text content to a file.
- Input: path (str) - Path to save the file, value (str) - Content to be saved.
- Return Value: None.
- Pre-conditions: FileHandler instance must be initialized.
- Post-conditions: Text content is saved to the specified file path.

open_file
- Purpose of function: Opens a file and reads its content.
- Input: user_file (str) - Path of the file to be opened.
- Return Value: str - Content of the file.
- Pre-conditions: FileHandler instance must be initialized.
- Post-conditions: File content is read and returned.

get_text_field_value
- Purpose of function: Retrieves the value of the text field.
- Return Value: str - Value of the text field.
- Pre-conditions: FileHandler instance must be initialized.
- Post-conditions: Value of the text field is returned.

run_program
- Purpose of function: Runs the program operation.
- Return Value: None.
- Pre-conditions: FileHandler instance must be initialized.
- Post-conditions: Program operation is executed.

stop_program
- Purpose of function: Stops the program operation.
- Return Value: None.
- Pre-conditions: FileHandler instance must be initialized.
- Post-conditions: Program operation is stopped.

InputControl Class

- Purpose of class: The InputControl class manages the input control functionality within the UVSim application.

build

- Purpose of function: Builds the UI layout for the input control.
- Return Value: None.
- Pre-conditions: InputControl instance must be initialized.
- Post-conditions: The UI layout for the input control is constructed and returned.

get_input

- Purpose of function: Retrieves user input.
- Return Value: str - User input.
- Pre-conditions: InputControl instance must be initialized.
- Post-conditions: User input is obtained and returned.

close_dlg

- Purpose of function: Closes the input dialog and updates the page.
- Return Value: None.
- Pre-conditions: InputControl instance must be initialized.
- Post-conditions: The dialog is closed, and the page is updated.

textfield_change

- Purpose of function: Handles text field changes and updates the send button state.
- Return Value: None.
- Pre-conditions: InputControl instance must be initialized.
- Post-conditions: The send button state is updated based on text field changes.

Operations Class

- Purpose of class: The Operations class manages the execution of operations within the UVSim application.

read_file

- Purpose of function: Reads instructions from a file and stores them in memory.
- Input: filename (str) - The name of the file to be read.
- Return Value: None.
- Pre-conditions: Operations instance must be initialized.
- Post-conditions: Instructions are read from the file and stored in memory.

set_got_input

- Purpose of function: Sets the flag indicating if input is received.
- Input: got_input (bool) - Flag indicating if input is received.
- Return Value: None.

- Pre-conditions: Operations instance must be initialized.
- Post-conditions: The flag indicating if input is received is set.

set_u_input
- Purpose of function: Sets the user input.
- Input: u_input (str) - The user input.
- Return Value: None.
- Pre-conditions: Operations instance must be initialized.
- Post-conditions: The user input is set.

get_output
- Purpose of function: Retrieves the output value.
- Return Value: str - The output value.
- Pre-conditions: Operations instance must be initialized.
- Post-conditions: The output value is retrieved.

stop_execution
- Purpose of function: Stops the program execution.
- Return Value: None.
- Pre-conditions: Operations instance must be initialized.
- Post-conditions: The program execution is stopped.

IO_op
- Purpose of function: Performs Input/Output operation.
- Input: op (int) - The operation code, address (int) - The memory address.
- Return Value: None.
- Pre-conditions: Operations instance must be initialized.
- Post-conditions: Input/Output operation is performed.

load_store_op
- Purpose of function: Performs Load/Store operation.
- Input: op (int) - The operation code, address (int) - The memory address.
- Return Value: None.
- Pre-conditions: Operations instance must be initialized.
- Post-conditions: Load/Store operation is performed.

arithmetic_op
- Purpose of function: Performs Arithmetic operation.
- Input: op (int) - The operation code, address (int) - The memory address.
- Return Value: None.
- Pre-conditions: Operations instance must be initialized.
- Post-conditions: Arithmetic operation is performed.

branch_op

- Purpose of function: Performs Branch operation.
- Input: op (int) - The operation code, address (int) - The memory address.
- Return Value: None.
- Pre-conditions: Operations instance must be initialized.
- Post-conditions: Branch operation is performed.

execute
- Purpose of function: Executes the program.
- Return Value: None.
- Pre-conditions: Operations instance must be initialized.
- Post-conditions: The program is executed.

OperationsError Class
- Purpose of class: The OperationsError class represents an error that occurs during operations within the UVSim application.

OutputControl Class
- Purpose of class: The OutputControl class manages the output display within the UVSim application.

display_output
- Purpose of function: Constructs the UI layout for displaying output.
- Return Value: ft.Column - The column containing output display elements.
- Pre-conditions: OutputControl instance must be initialized.
- Post-conditions: The UI layout for displaying output is constructed and returned.

update_output
- Purpose of function: Updates the output display with new content.
- Input: output (str) - The output content to be displayed.
- Return Value: None.
- Pre-conditions: OutputControl instance must be initialized.
- Post-conditions: The output display is updated with the new content.

build
- Purpose of function: Builds the UI layout for the output control.
- Return Value: ft.Row - The row containing output display elements.
- Pre-conditions: OutputControl instance must be initialized.
- Post-conditions: The UI layout for the output control is constructed and returned.

Topbar Class

- Purpose of class: The Topbar class manages the top app bar and theme selection within the UVSim application.

build

- Purpose of function: Builds the UI layout for the top app bar.
- Return Value: ft.AppBar - The constructed app bar.
- Pre-conditions: Topbar instance must be initialized.
- Post-conditions: The UI layout for the top app bar is constructed and returned.

green_theme, blue_theme, Teal_theme, purple_theme, custom_theme

- Purpose of function: Define different theme options for the UVSim application.
- Input: e (Event) - Event triggering the theme selection.
- Return Value: None.
- Pre-conditions: Topbar instance must be initialized.
- Post-conditions: The theme of the application is updated based on the selected theme option.

is_hex_color

- Purpose of function: Check if a given string represents a valid hexadecimal color code.
- Input: s (str) - The string to be checked.
- Return Value: bool - True if the string is a valid hexadecimal color code, False otherwise.
- Pre-conditions: None.
- Post-conditions: The validity of the color code is checked and returned.

custom_theme

- Purpose of function: Define a custom theme based on user-defined color inputs.
- Input: e (Event) - Event triggering the custom theme selection.
- Return Value: None.
- Pre-conditions: Topbar instance must be initialized.
- Post-conditions: The custom theme is applied to the UVSim application based on user-defined color inputs.

UVSimPage Class

- Purpose of class: The UVSimPage class manages the user interface layout for the UVSim simulation page within the UVSim application.

build

- Purpose of function: Builds the UI layout for the UVSim simulation page.
- Return Value: ft.Column - The column containing UI elements.
- Pre-conditions: UVSimPage instance must be initialized.

- Post-conditions: The UI layout for the UVSim simulation page is constructed and returned.

run_button_result, stop_button_result

- Purpose of function: Handles the result of clicking the run or stop button, respectively.
- Input: e (Event) - Event triggering the function call.
- Return Value: None.
- Pre-conditions: UVSimPage instance must be initialized.
- Post-conditions: The corresponding action (running or stopping the program) is executed.

program_layout

- Purpose of function: Defines the layout for the program control buttons (run and stop).
- Return Value: ft.Column - The column containing the program control buttons.
- Pre-conditions: UVSimPage instance must be initialized.
- Post-conditions: The layout for the program control buttons is defined and returned.

run_button, stop_button

- Purpose of function: Defines the run and stop button UI elements, respectively.
- Return Value: ft.ElevatedButton - The run or stop button.
- Pre-conditions: UVSimPage instance must be initialized.
- Post-conditions: The run or stop button UI element is defined and returned.