Dashboards - supplement

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Control flow: what code exactly does streamlit run?

- Every time the user loads the app or interacts with an input widget:

  - the entire `.py` file re-runs from top to bottom

  - the UI is rebuilt

  - the app refreshes

- To avoid re-running unnecessary parts of the dashboard, you can wrap it in a function and only call it when necessary

  - We can extend this further by wrapping the function in a decorator so that it only runs *the first time* it is called (more on this later)

- This is how the multipage and uber dashboards examples used functions

Multipage + selection box: simple example

3/multipage_simple.py: (link)

```python
import streamlit as st

# This message is always displayed
st.write("Welcome message")

# define functions for what each page displays
def my_first_page():
    st.write("my first page")
def my_second_page():
    st.write("my second page")

# define dictionary for what is in the selection box
page_names_to_funcs = {
    "First Page": my_first_page,
    "Second Page": my_second_page
}

```

Syntax for conditional call to each function

The following two code snippets will do the same thing. First one:

```python
if demo_name == "First Page":
    my_first_page()
elif demo_name == "Second Page":
    my_second_page()
```

Second one (seen in `multipage.py`):

```python
page_names_to_funcs[demo_name]()
```

Second snippet uses `demo_name` as key, looks up corresponding function in `page_names_to_funcs` dictionary, and then calls it (by adding `()` to the end)

Ordering of code within your `app.py`

- Because streamlit reads your code from top to bottom, you need to define all functions first *before* you define any streamlit widgets that call those functions

- The following code would lead to an error (next slide)

Ordering of code within your `app.py`

3/multipage_simple_wrongorder.py: (link)

```python
import streamlit as st

# This message is always displayed
st.write("Welcome message")

# define dictionary for what is in the selection box
page_names_to_funcs = {
    "First Page": my_first_page,
    "Second Page": my_second_page
}

# define the selection box
demo_name = st.sidebar.selectbox(
    "Choose a page",
    page_names_to_funcs.keys()
)

# only run a function if the user has selected that page
```

What you would have seen in terminal

```
 1  ───────────────────────── Traceback (most recent call last) ───────────
 2  /Users/mengdishi/anaconda3/envs/dap/lib/python3.13/site-packages/streamli
 3  criptrunner/exec_code.py:129 in exec_func_with_error_handling
 4
 5  /Users/mengdishi/anaconda3/envs/dap/lib/python3.13/site-packages/streamli
 6  criptrunner/script_runner.py:672 in code_to_exec
 7
 8  /Users/mengdishi/Github/dashboards/3/multipage_simple_wrongorder.py:8 in
 9
10      5
11      6 # define dictionary for what is in the selection box
12      7 page_names_to_funcs = {
13  ❯   8 |     "First Page": my_first_page,
14      9 |     "Second Page": my_second_page
15     10 }
16     11
17  ─────────────────────────────────────────────────────────────────────────
18  NameError: name 'my_first_page' is not defined
```