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De-Escher-ing SOAR Playbook Development

Simplifying the Stairwell
SEC1475C

Mhike Funderburk
Principal Security Engineer | UltraViolet Cyber

Luke Summers
SOAR Technical Lead | UltraViolet Cyber

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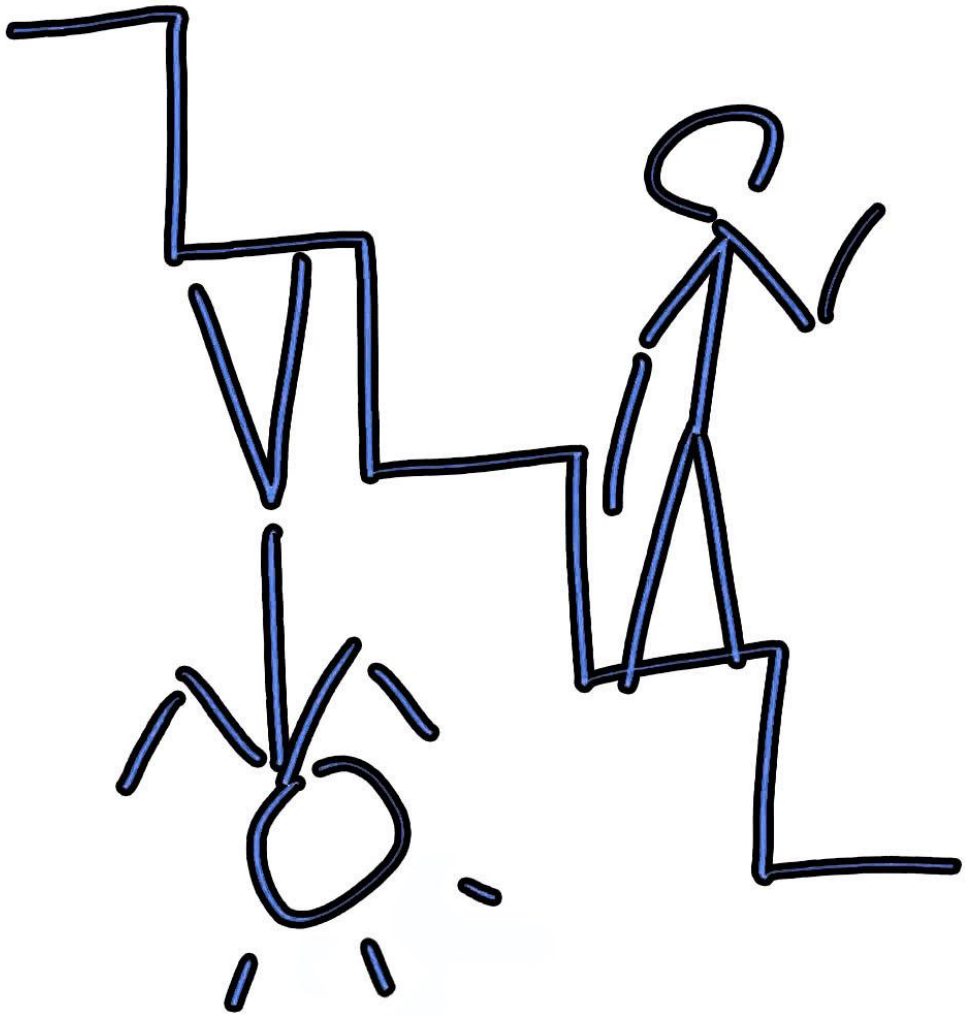
De-Escher-ing SOAR Playbook Development

Simplifying the Stairwell
SEC1475C



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Luke Summers
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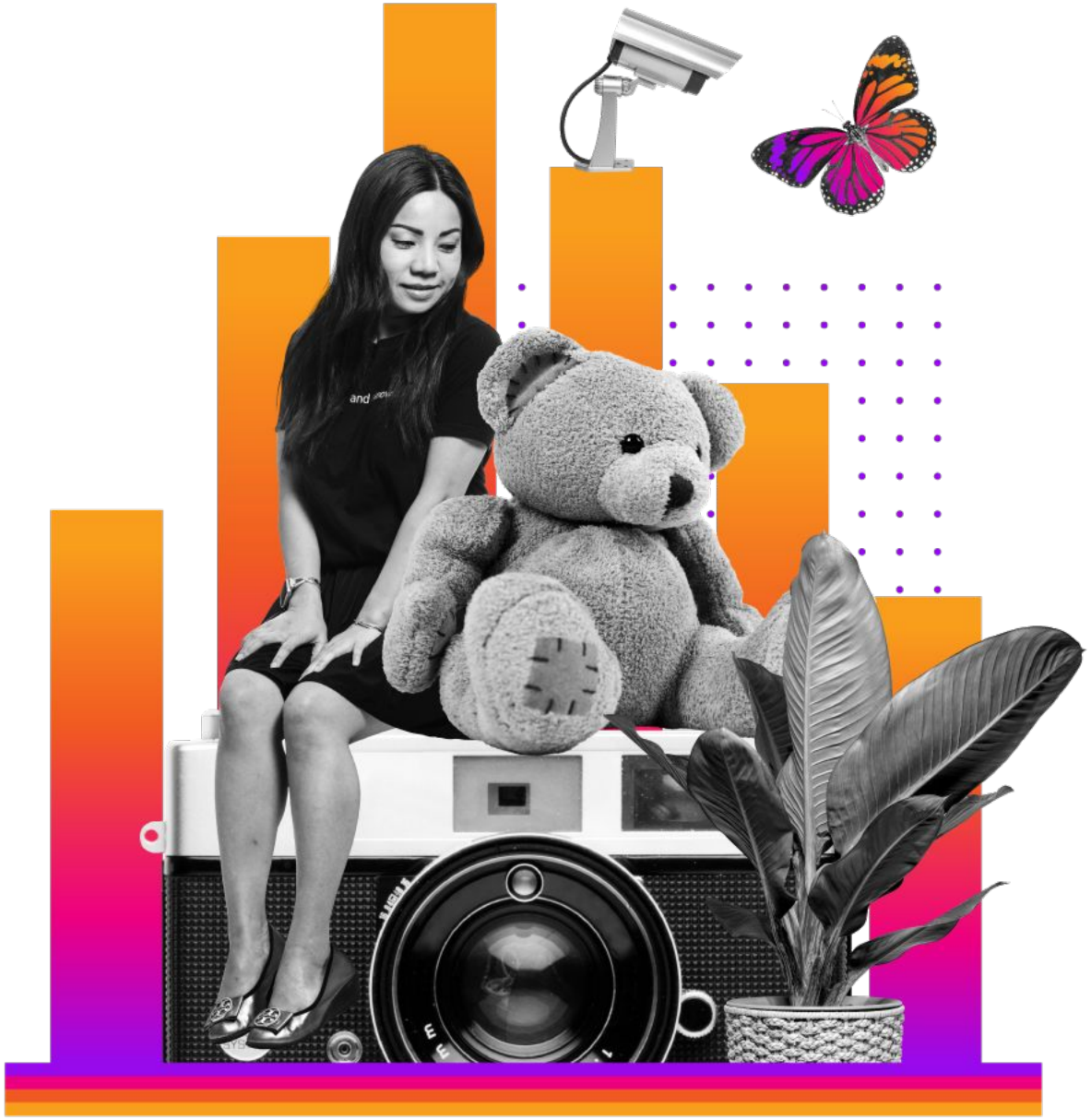

Datapaths

Starting simple

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Datapath Structure

artifact:* .cef.src

Artifacts are JSON representations of events and data

artifact:*

Retrieves all artifacts in the container

.cef

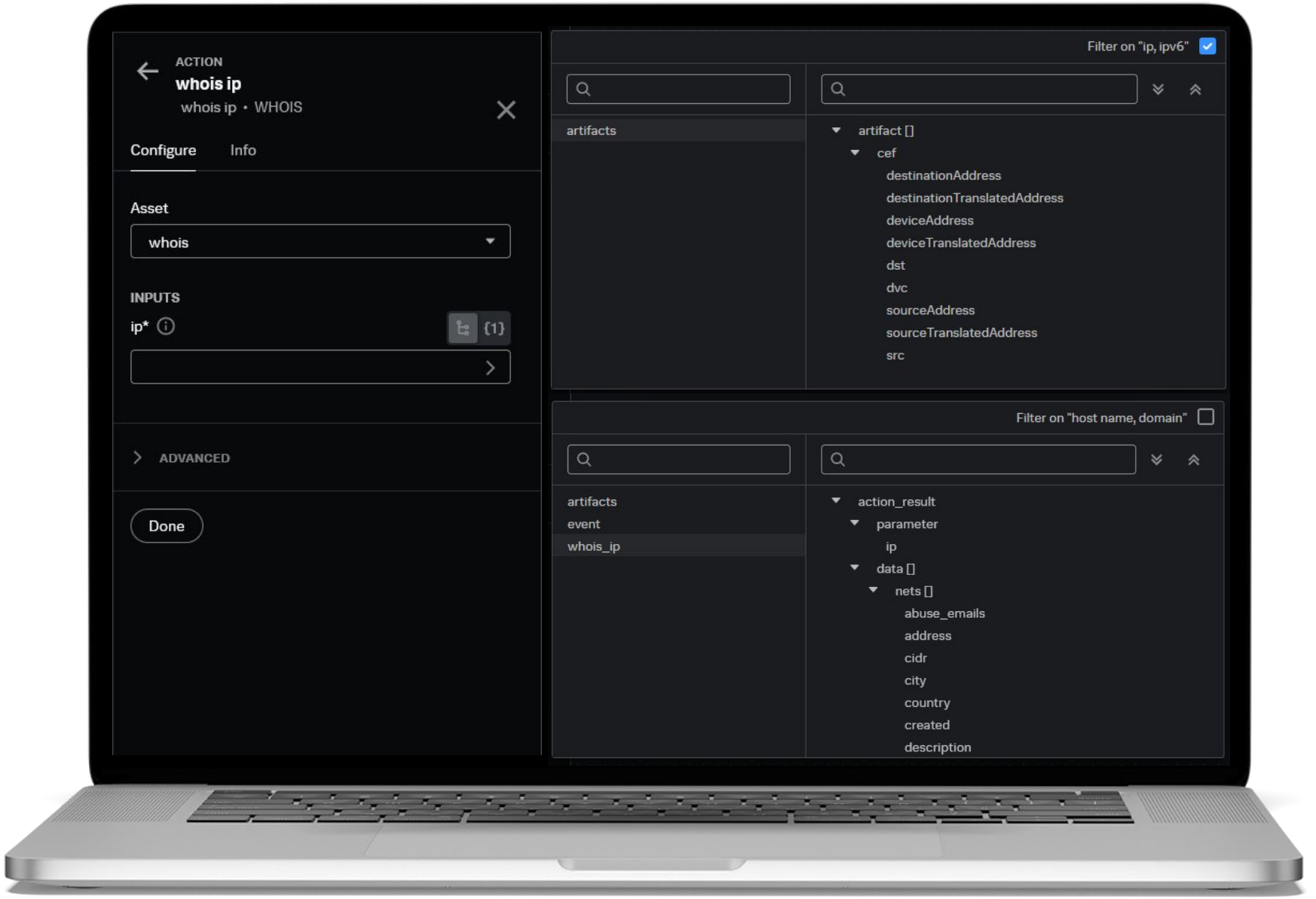
Literal name of the JSON dictionary containing the key-value pairs

.src

The name of the field which contains the value you want

Selecting Datapaths

- Artifact field names based on the CEF naming convention
- Action result field names configured by the utilized app
- The options in this menu are not exhaustive



Datapath Overrides

Some modifications to datapaths can get help get what you need. Others that look like they would work return null.

- `artifact:*.cef.my_field`
  - Normal Operation

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- `artifact:*.cef.my_field`
  - Normal Operation
- `artifact:*.cef`
  - Get the entire cef dictionary for the artifacts
- `artifact:*`
  - Invalid datapath
- `my_action_1:action_result.data.my_field`
  - Normal Operation
- `my_action_1:action_result.data`
  - Get the entire data dictionary from the action result
- `my_action_1:action_result`
  - Invalid datapath. Returns a null list

test_datapaths Function

Copy

```
@phantom.playbook_block()
def test_datapaths(action=None, success=None, container=None, results=None, handle=None, filtered_artifac
    phantom.debug("test_datapaths() called")

    container_artifact_data = phantom.collect2(container=container, datapath=["artifact:*.cef.my_field"])

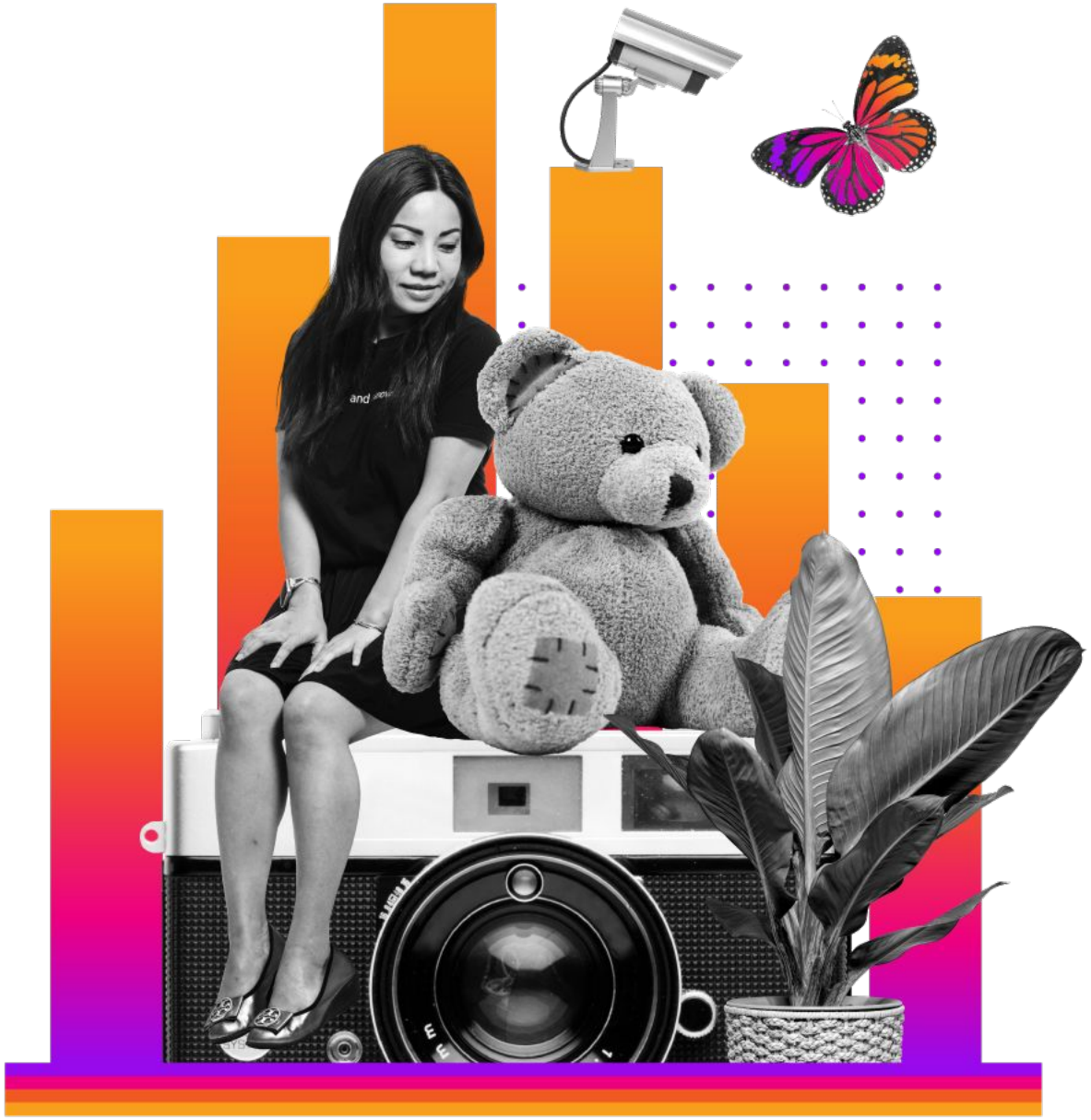
    container_artifact_cef_item_0 = [item[0] for item in container_artifact_data]



    container_artifact_data = phantom.collect2(container=container, datapath=["artifact:*.cef"])

    container_artifact_header_item_0 = [item[0] for item in container_artifact_data]


    input_parameter_0 = "artifact:*"
```



Decisions & Filters

Ramping up a little

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What's The Difference?

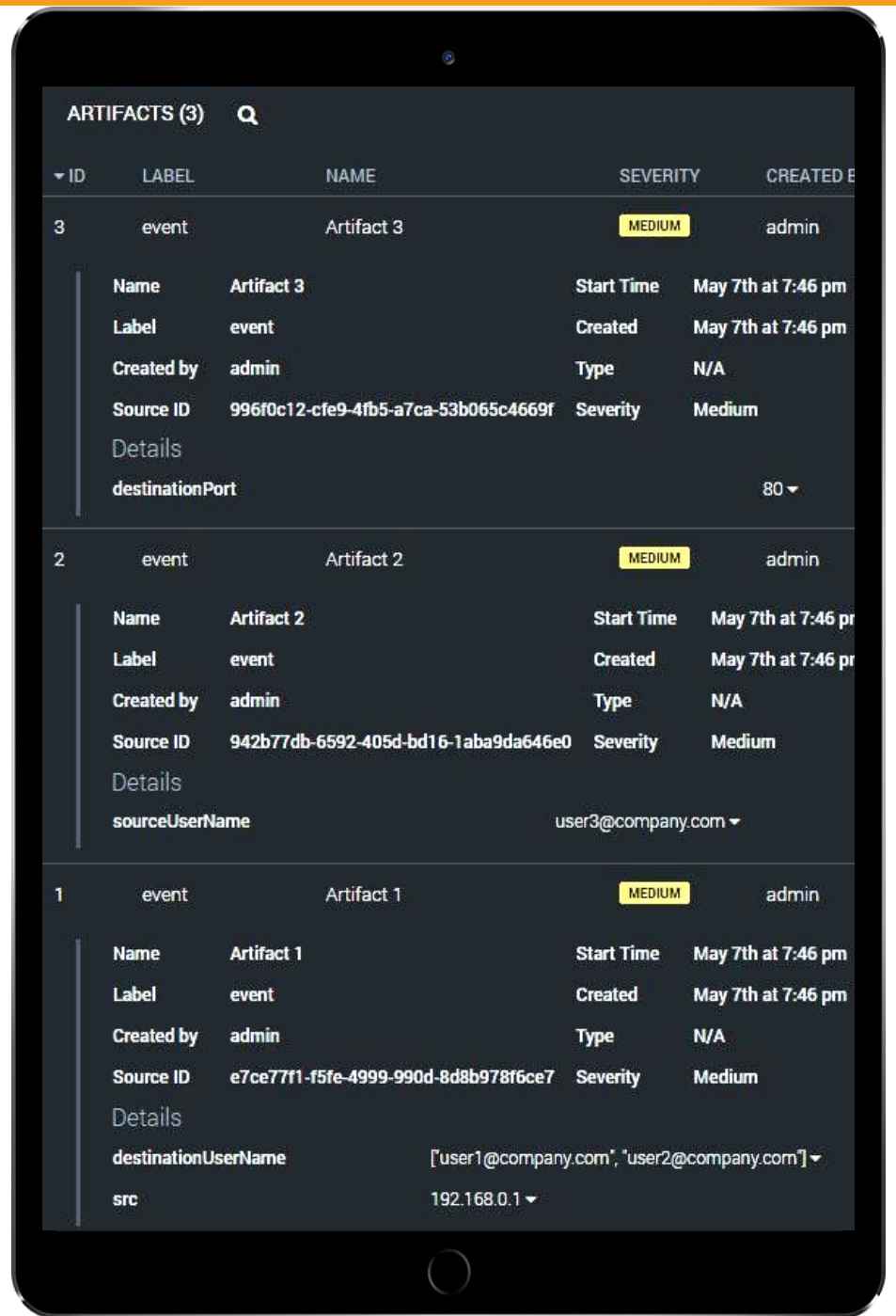
Don't they both contain if statement operators?

Decision Blocks

- Works like an if…else statement
- Only executes one branch
- Has no effect on the data

Filter Blocks

- Functions as back-to-back if statements
- Any and all branches can be executed
- Returns a subset of the given data



I Want the Src

➔ artifact:*.cef.src

A **[‘192.168.0.1’]**

B **[None]**

C **[‘192.168.0.1’, None, None]**

D **[None, None, None, None]**

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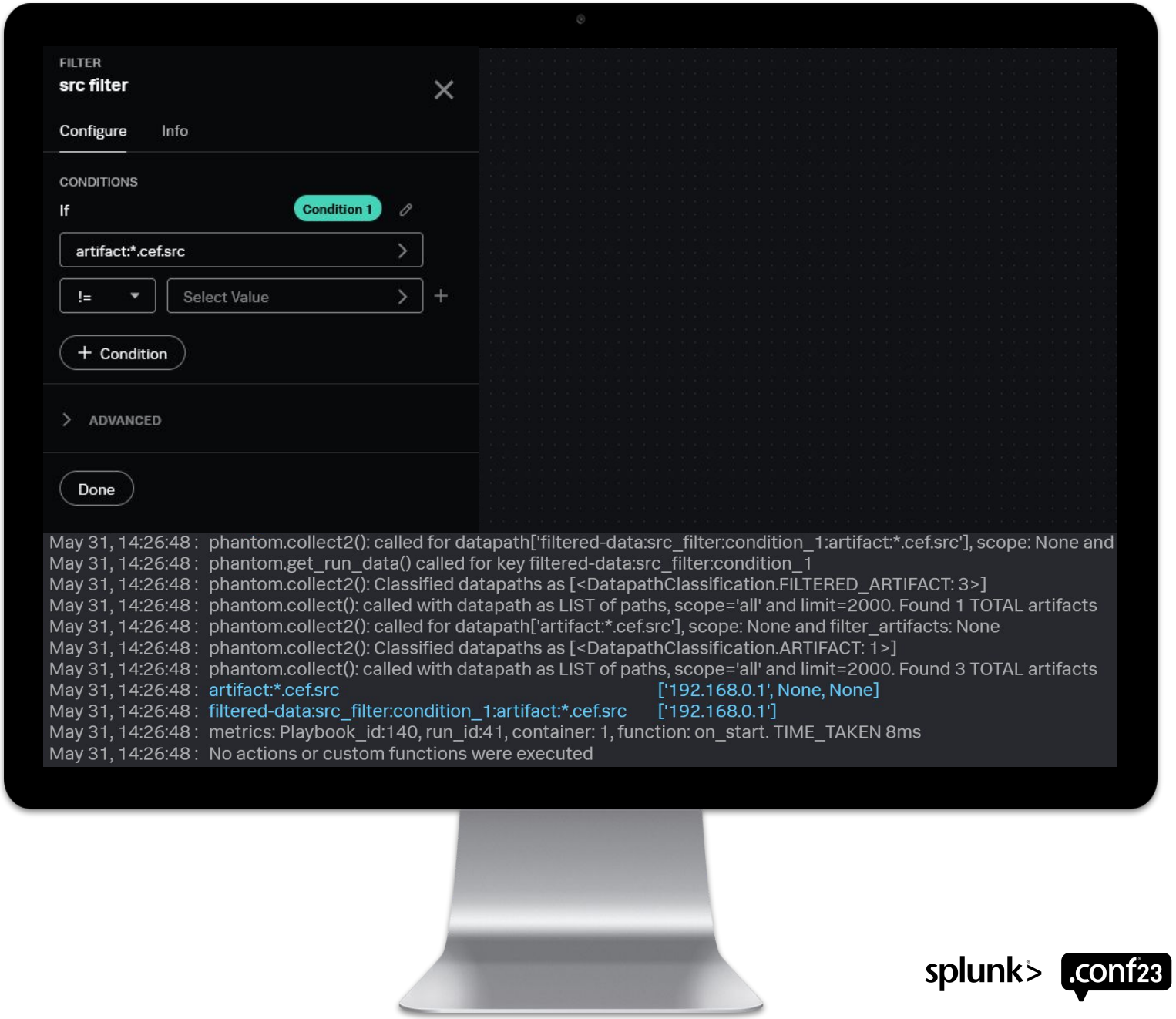
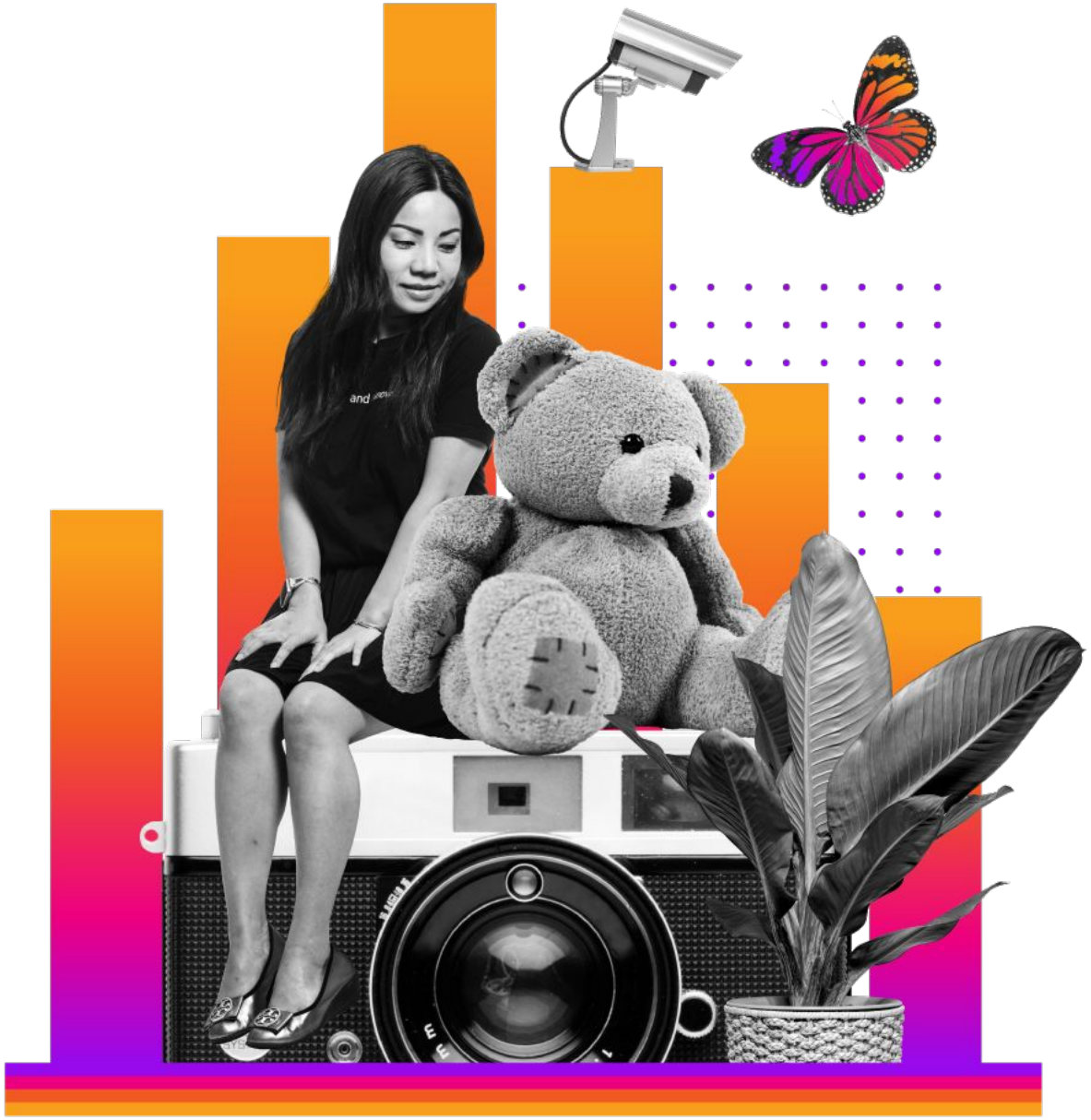
Filter Example

- Filter blocks return a subset of the given data
- Compare the field to a blank input
- If you want less data than you have:
  Filter Blocks





The Joy of Joins

Spoiler Alert not a joy

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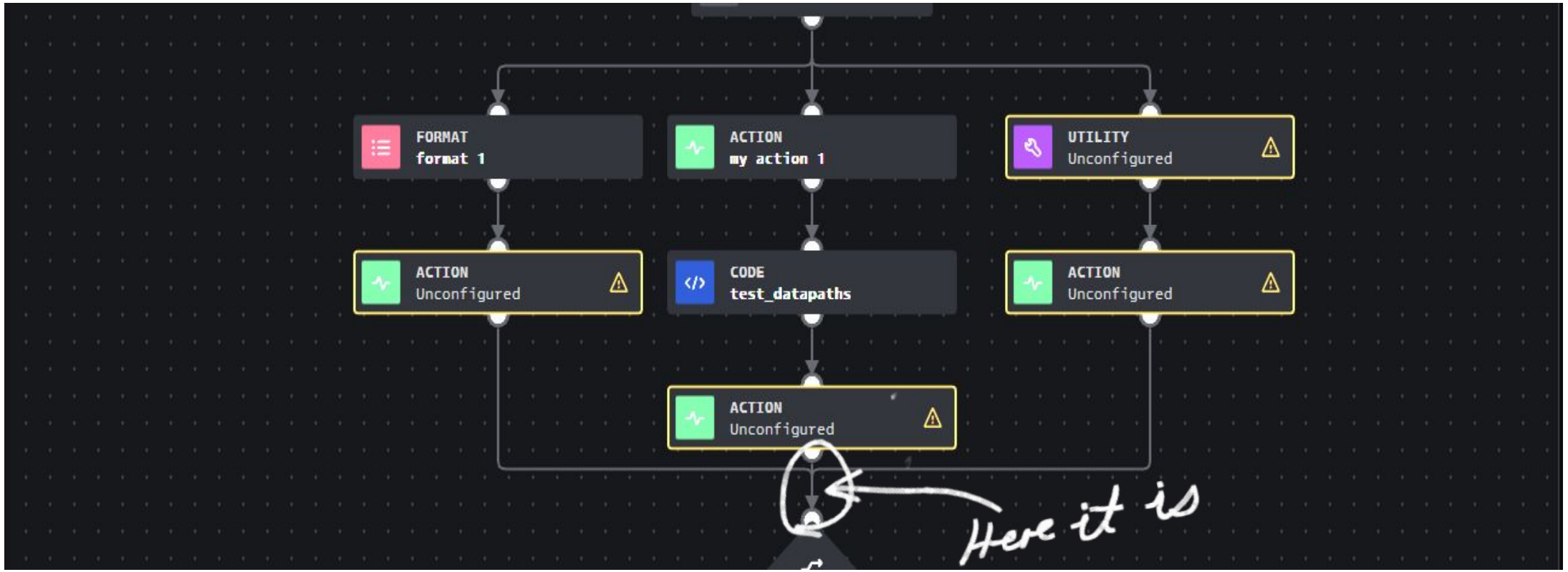
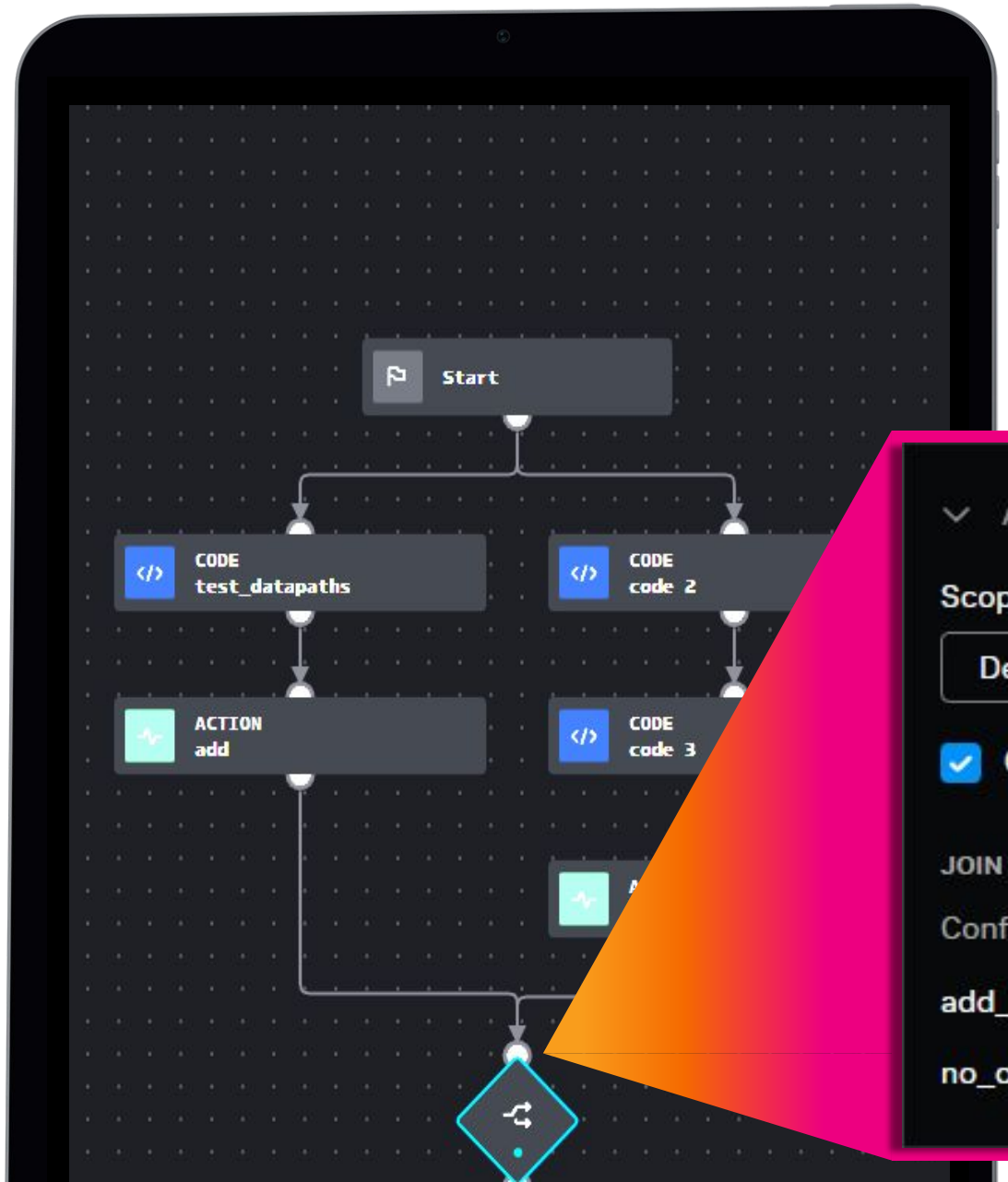
Find the Join

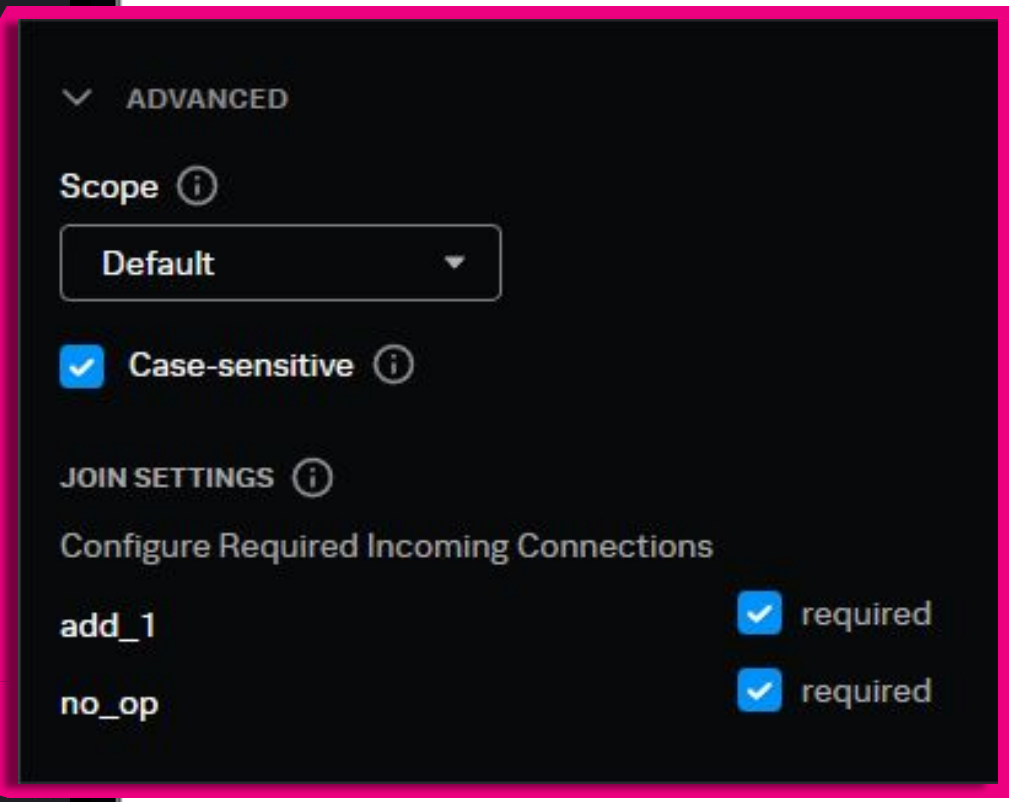
And then try not to use them



Configuring Joins

Everything is on





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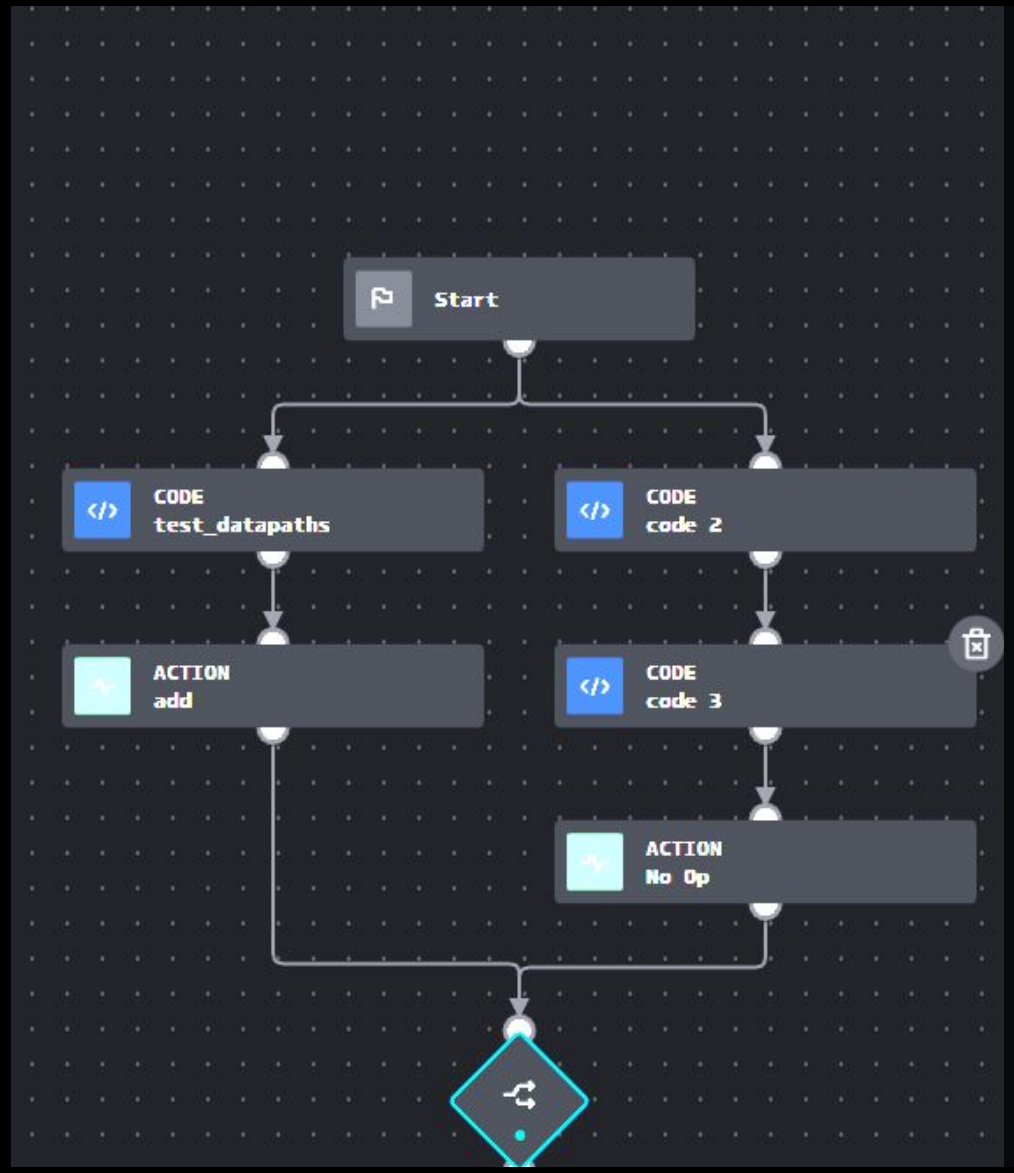

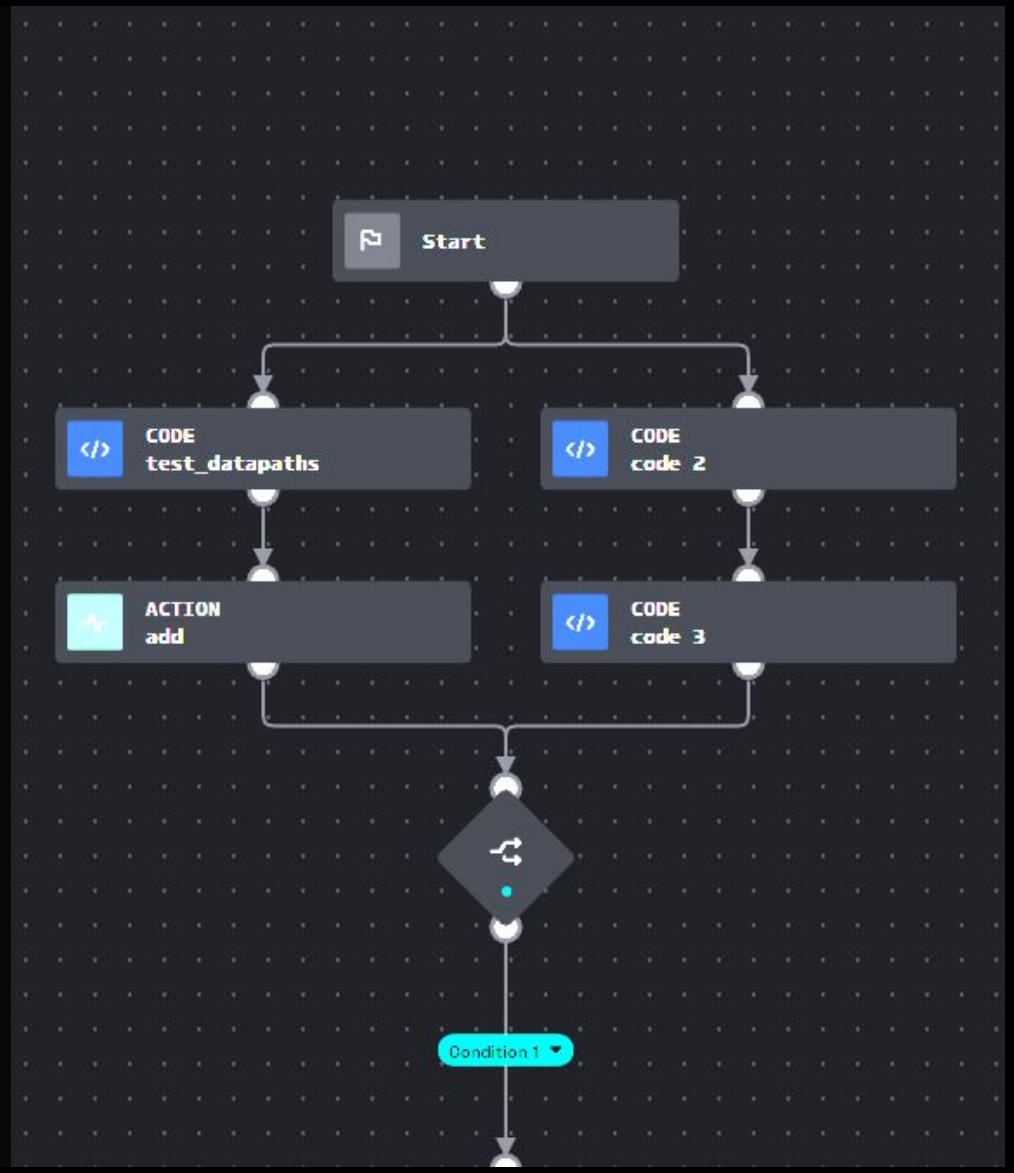

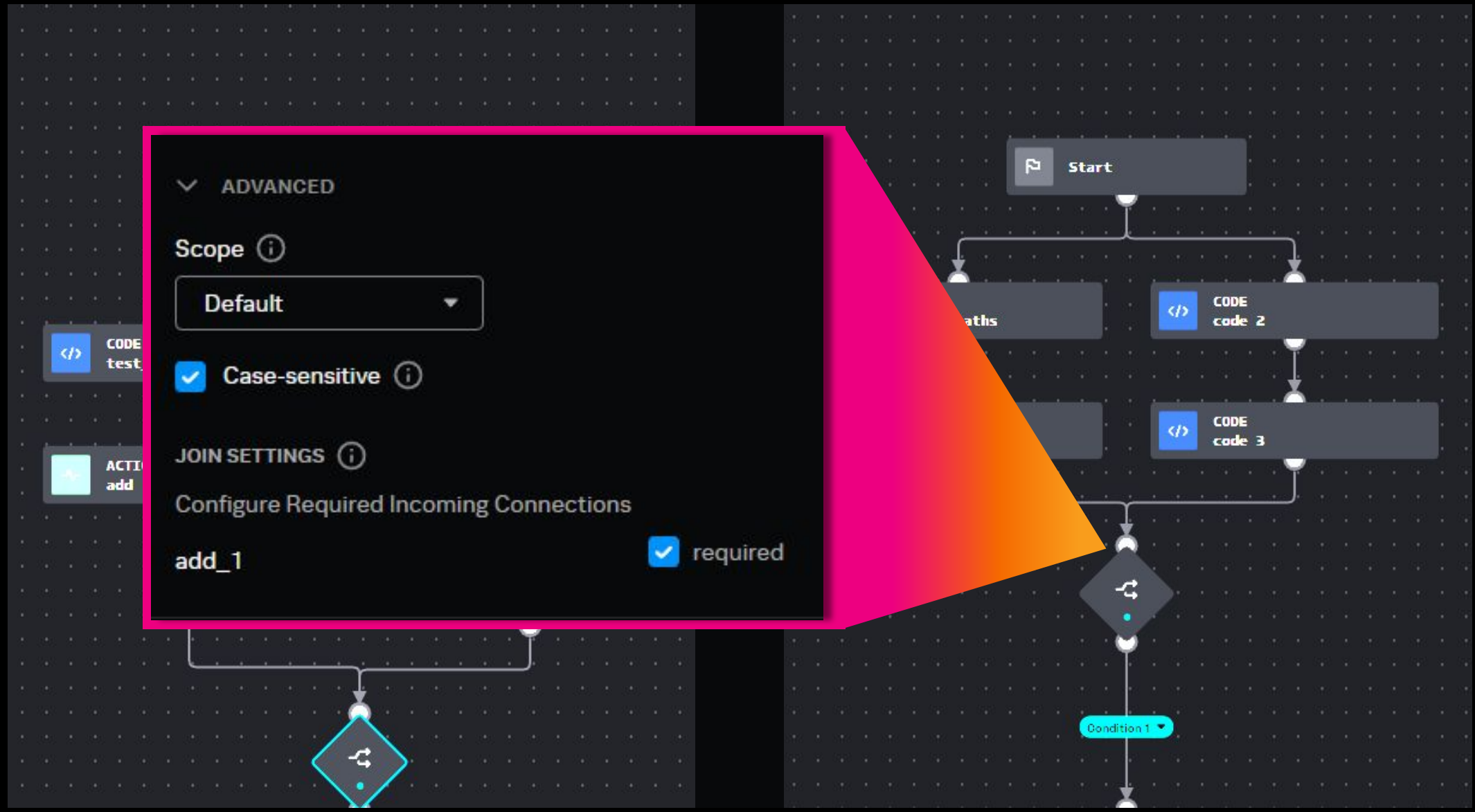

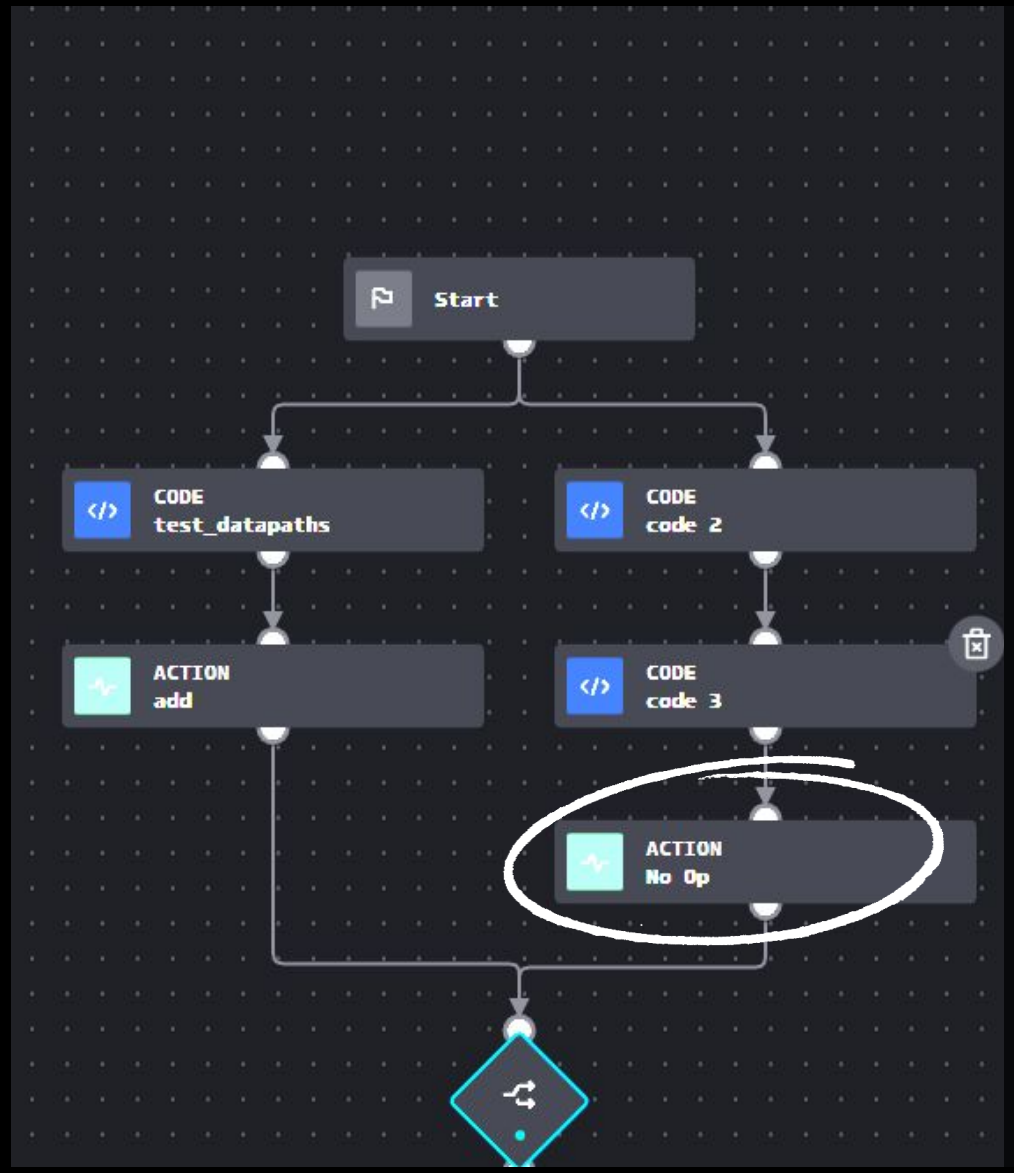

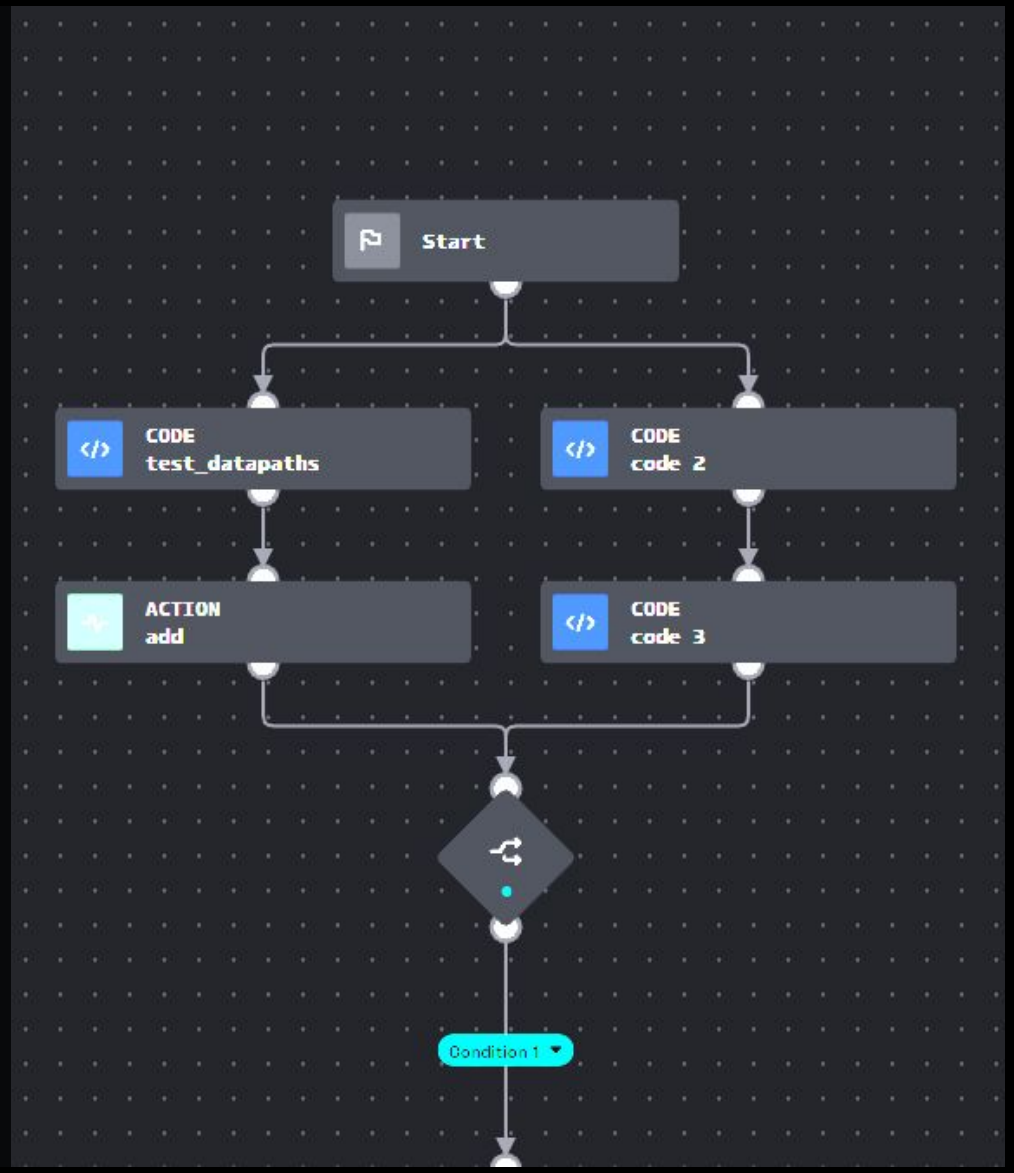

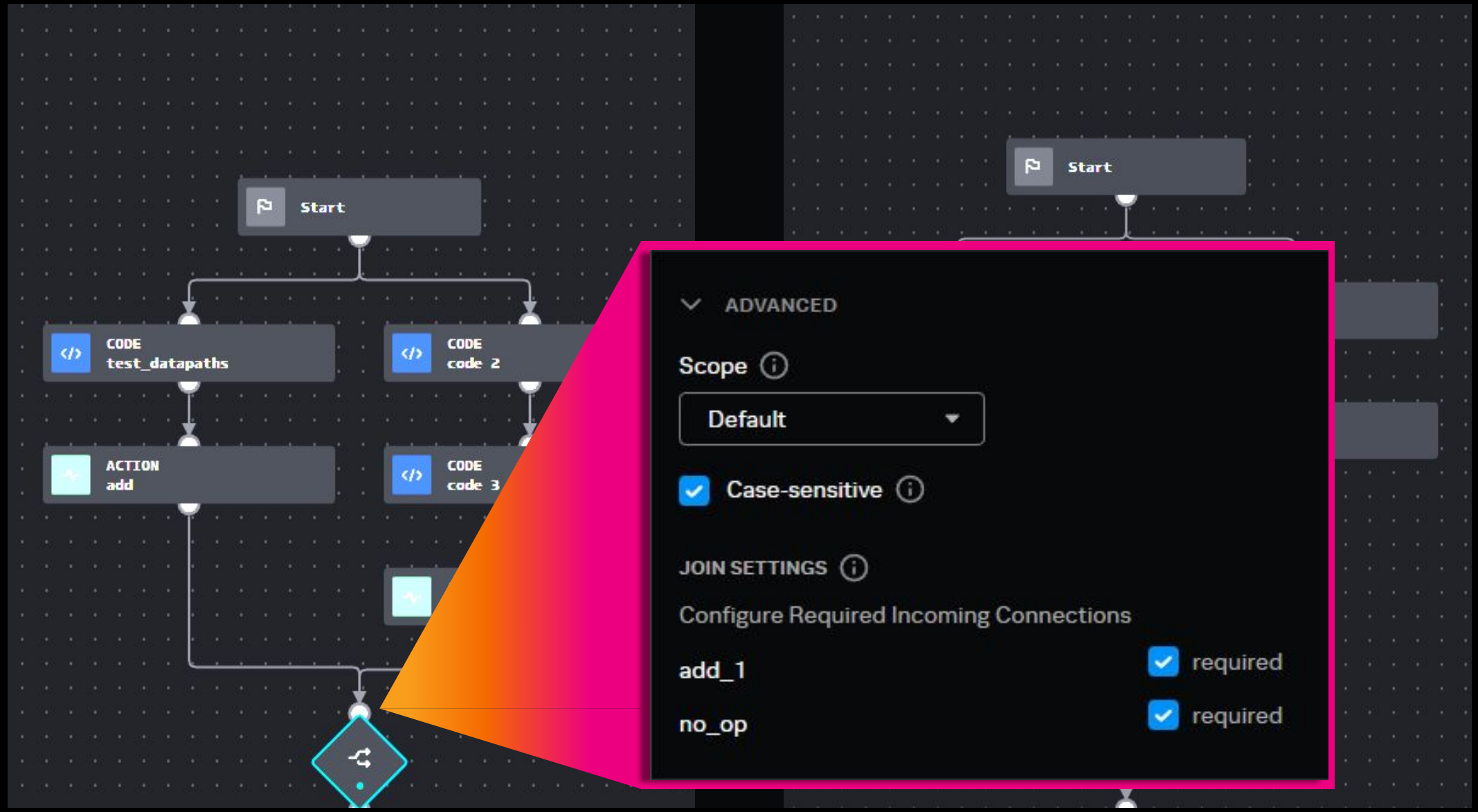

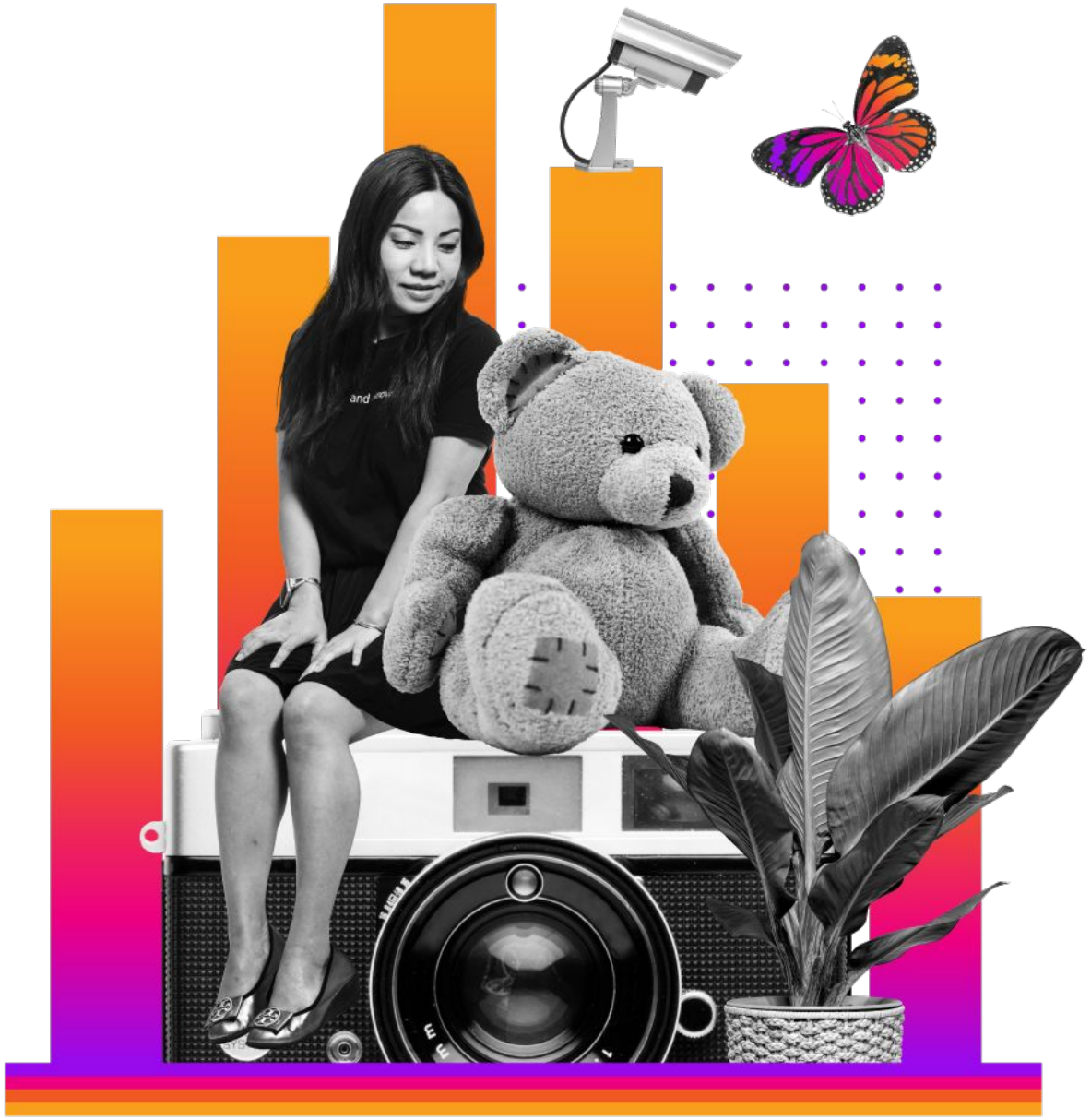

Capturing Variables

Are we sure this is “no code”?

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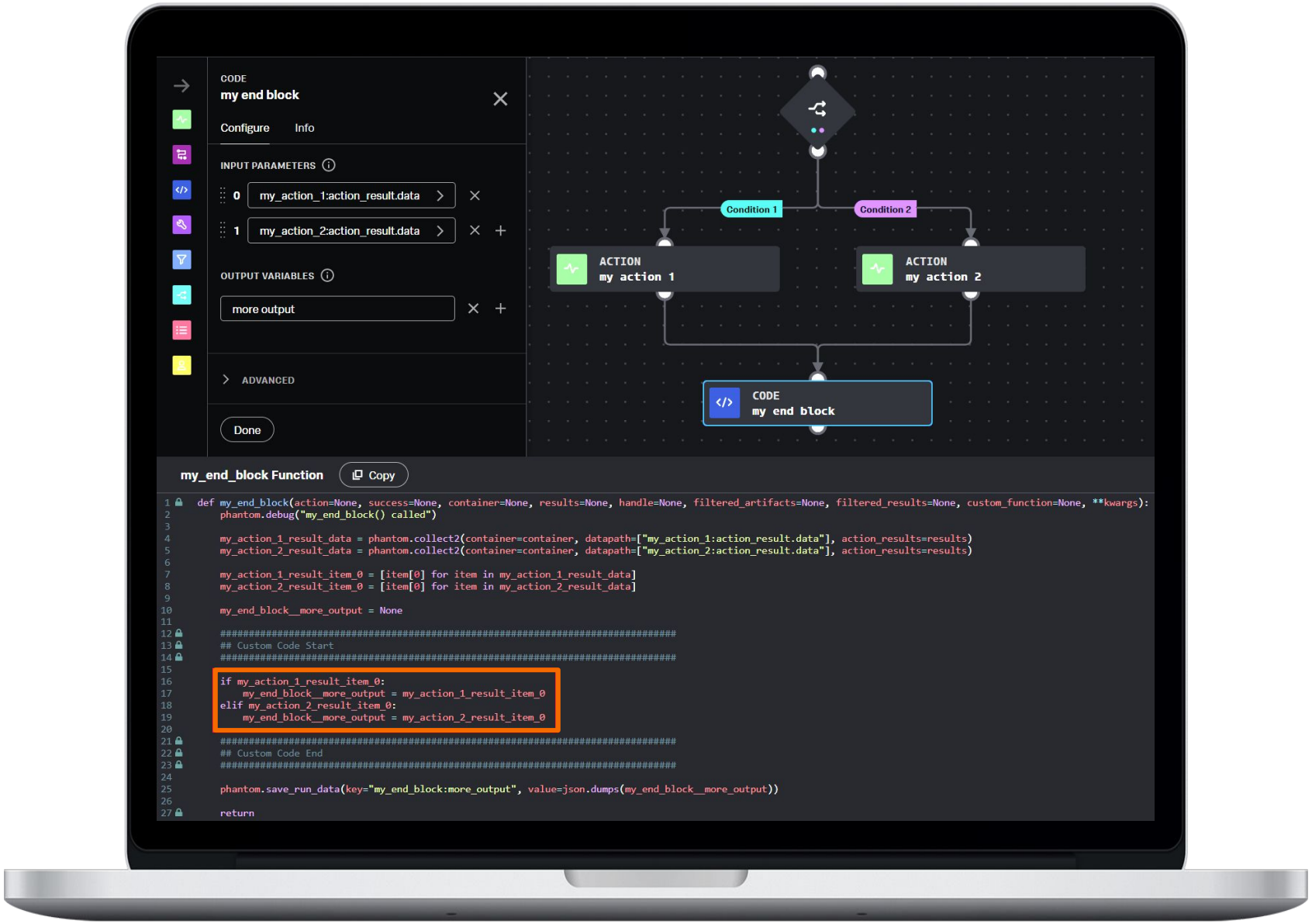
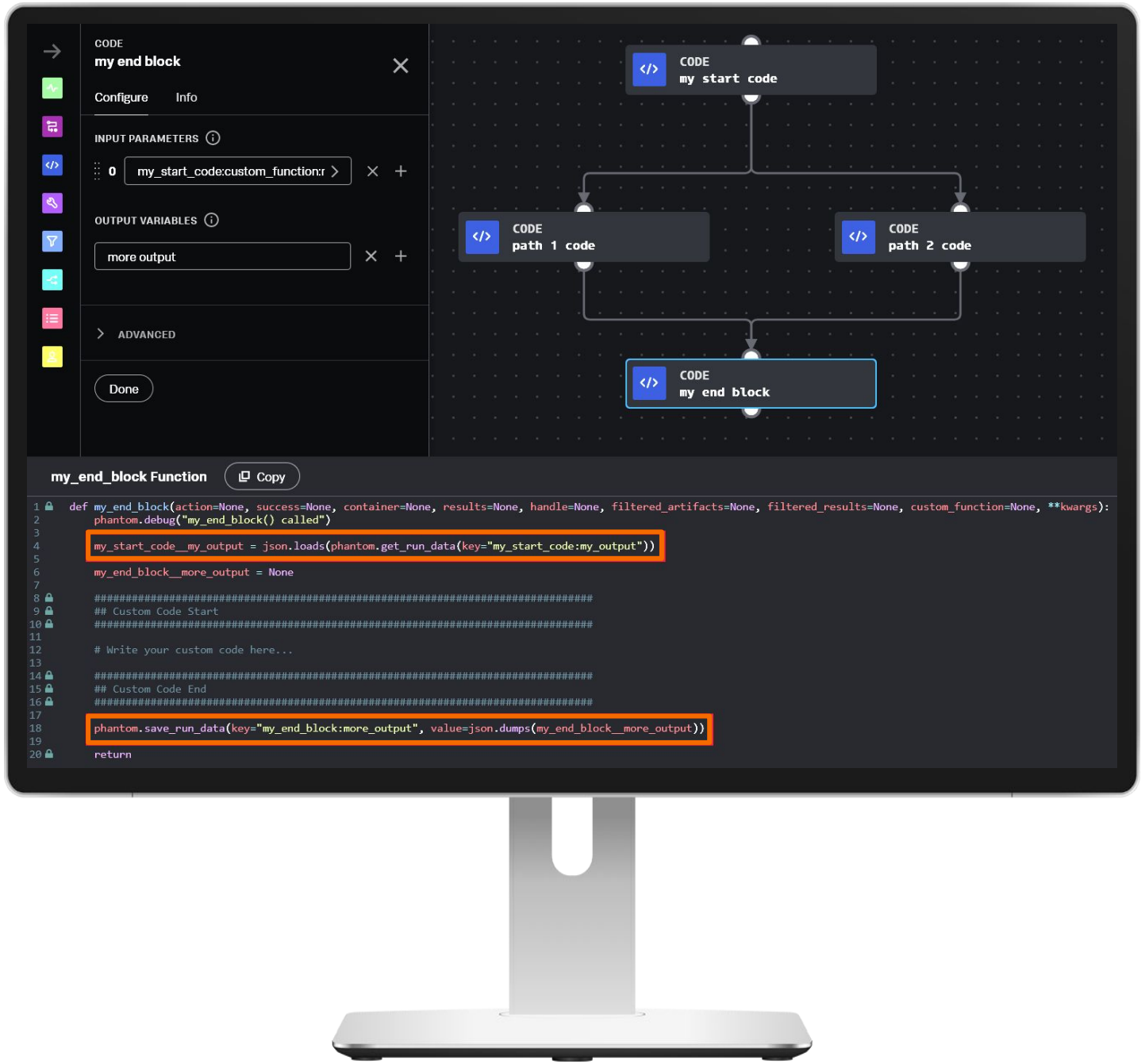
Global Variables?

- Global variables can be made in the global block
  - Can be accessed and modified in custom code blocks
  - Cannot be used as action inputs
  - Not recommended
- Using a code block to manually join the outputs of the two branches
  - Reasonable solution
  - Can be used for action inputs





Global Vars the SOAR Way (Sort Of)

- phantom.save_run_data( )
  - Stores your data with the given key
- phantom.get_run_data( )
  - Retrieves your data from the given key
- Can also be used as the input parameter of a subsequent action

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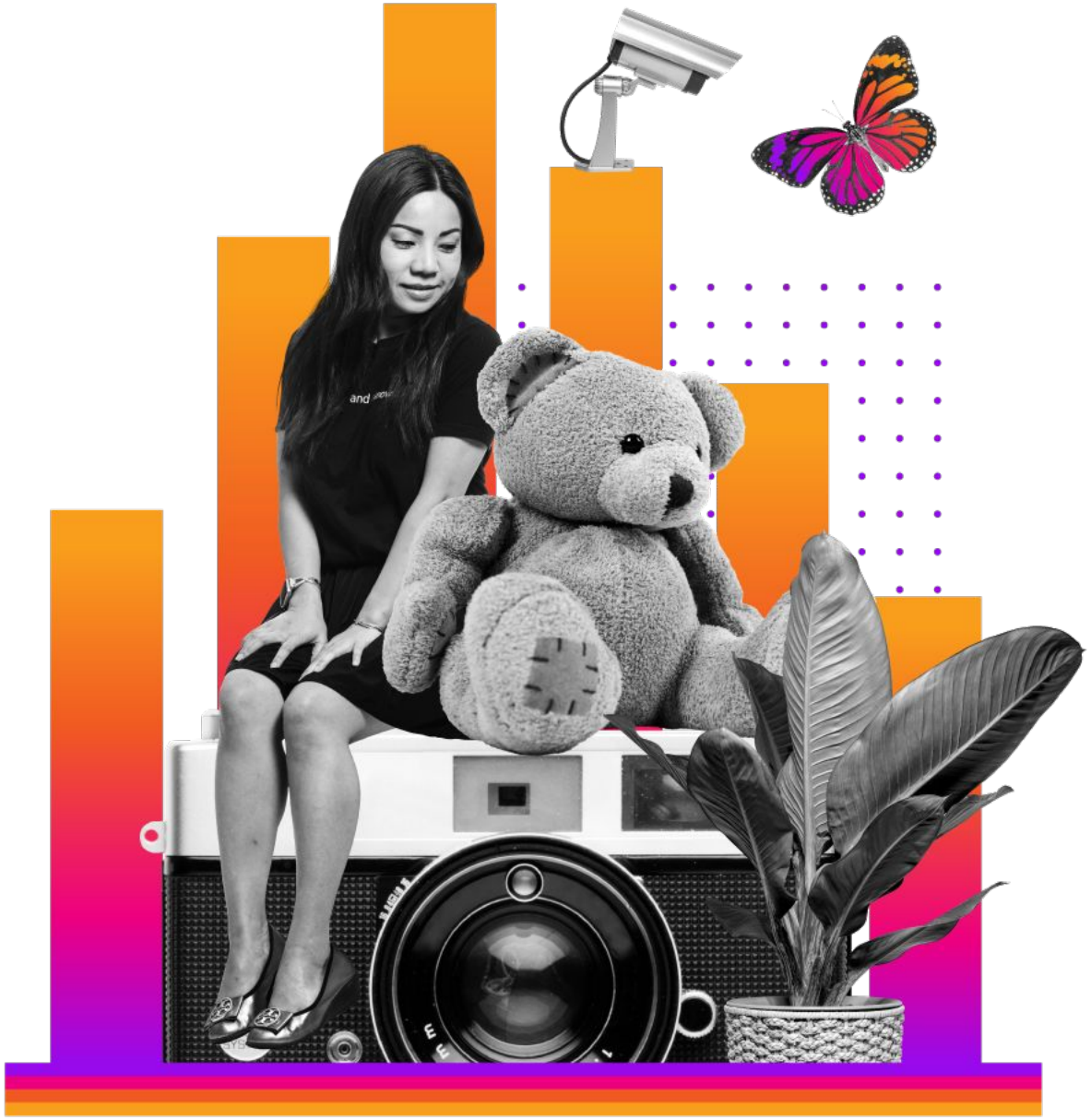

Format Loops

Well this is just not intuitive

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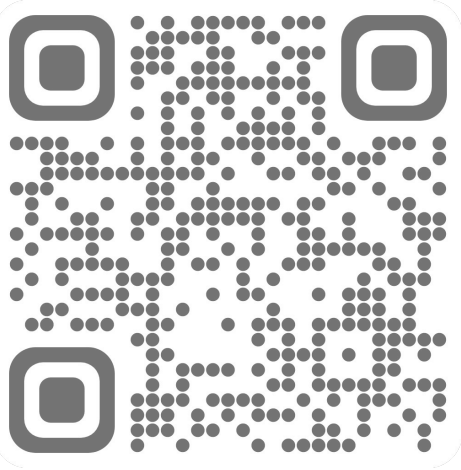
Format Input Looping

Making lists out of not lists



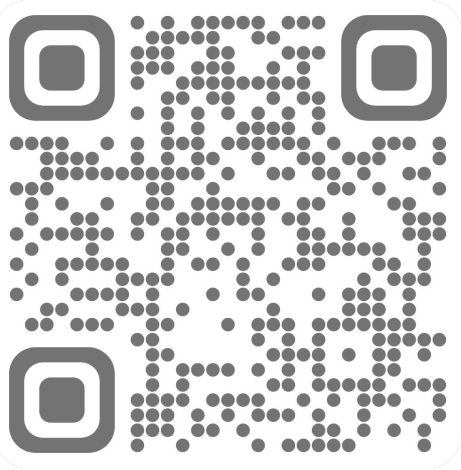
Standard Format

```
Hello {0},
The SOC has identified some
suspicious activity using your
enterprise credentials: {1}

As part of the response to this
discovery, your account password is
going to be reset etc etc blah blah
blah it’s going to be a bad day for
you
```

Format Input Looping

Making lists out of not lists



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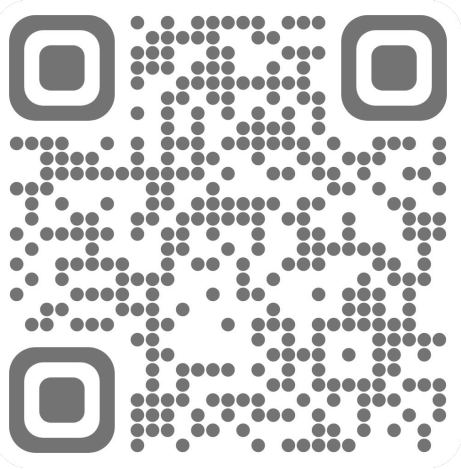
```

Loop Format

```
%%
{0}
%%
```

Format Input Looping

Making lists out of not lists



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The SOC has identified some
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As part of the response to this
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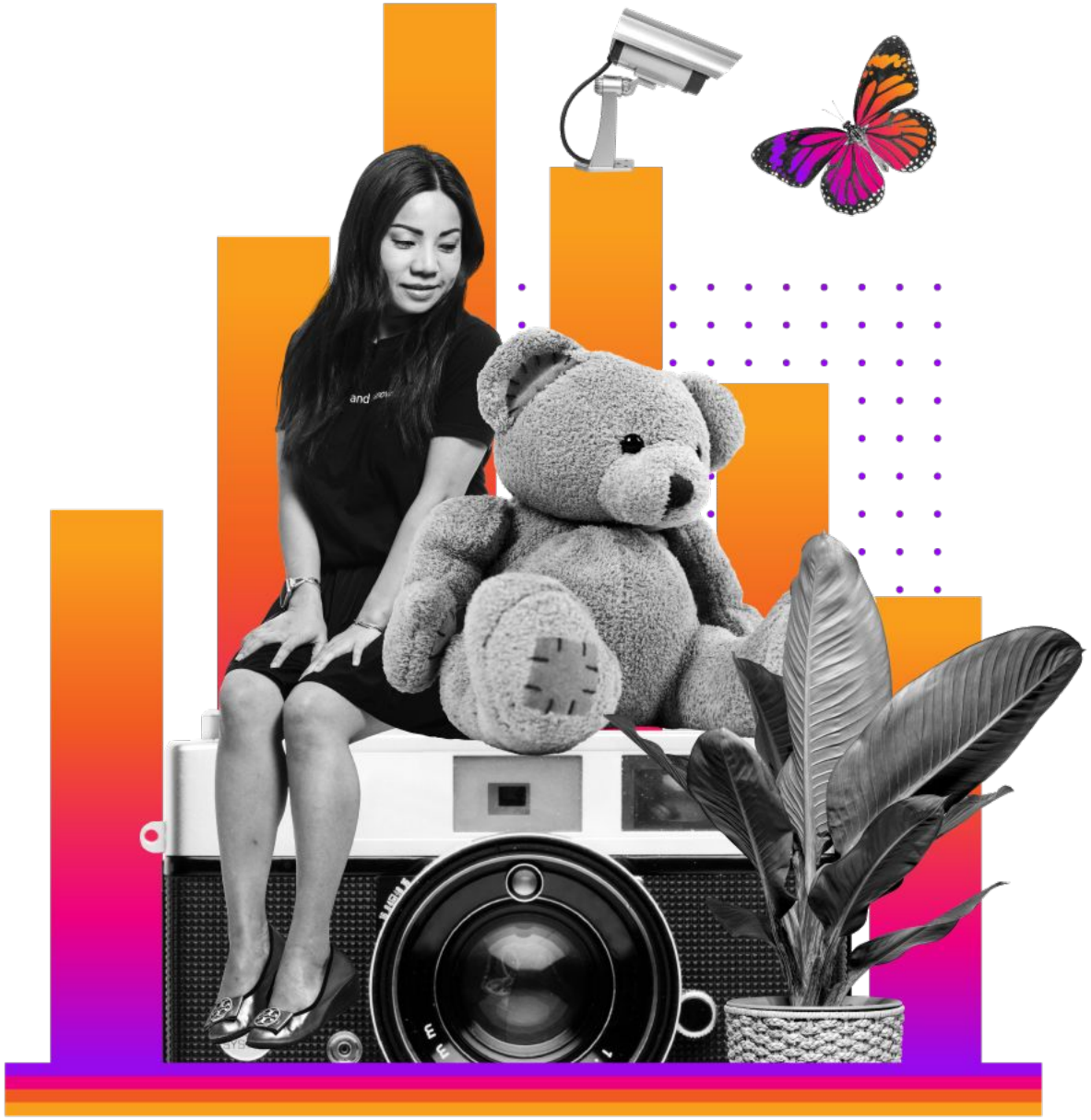
going to be reset etc etc blah blah
blah it’s going to be a bad day for
you
```

Loop Format

```
Hello {0},
The SOC has identified some
suspicious activity using your
enterprise credentials:
%%
Suspicious application: {1}
%%

Please remove these items ASAP.
```



Utility Functions

Wield the power of reusable code!

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Inputs: List vs Item

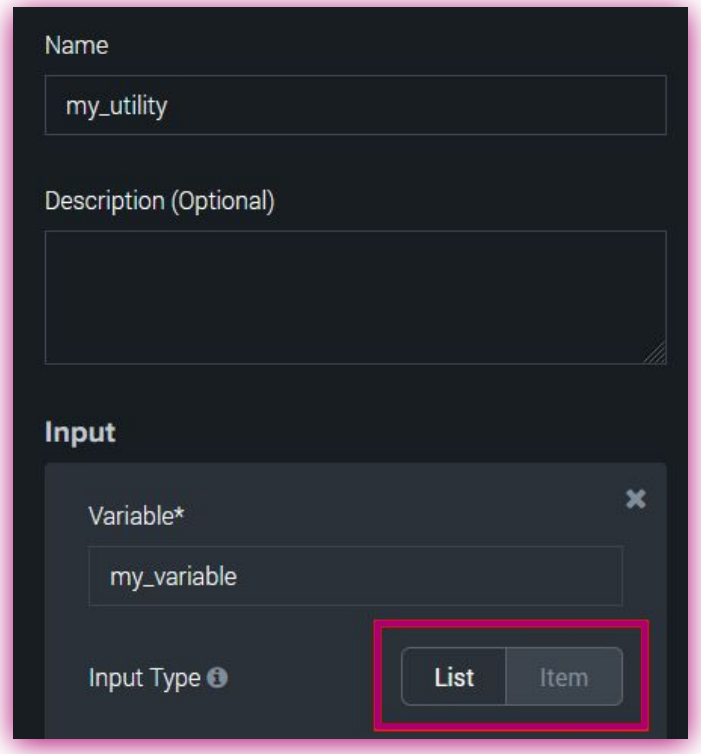
Input variables need an input type

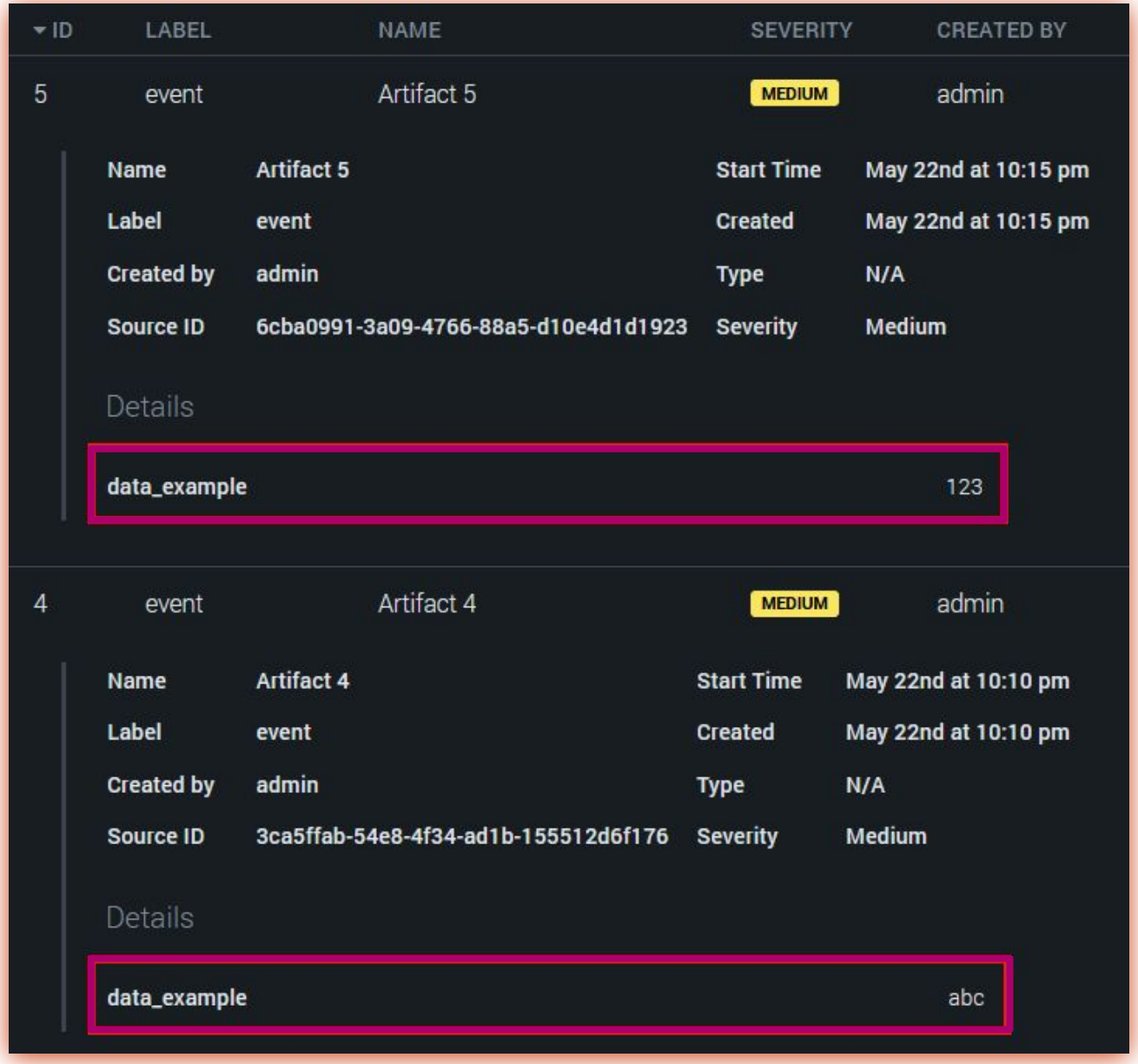
List

- The utility is run just one time
- Useful for taking care of everything with code

Item

- The utility is run once for each value
- Useful for taking a more SOAR-like approach





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1 | Test | Scope | All Artifacts | Run as current user

Copy | Status: Done

```
May 30, 13:20:48 :  my_list_utility() called
May 30, 13:20:48 :  phantom.collect2(): called for datapath['filtered-data:filter_3:condition_1:artifact:*.cef.data_example', 'filtered-data:filter_3:condition_1:artifact:*.id'], scope: None and filter_artifacts: None
May 30, 13:20:48 :  phantom.get_run_data() called for key filtered-data:filter_3:condition_1
May 30, 13:20:48 :  phantom.get_run_data() called for key filtered-data:filter_3:condition_1
May 30, 13:20:48 :  phantom.collect2(): Classified datapaths as [<DatapathClassification.FILTERED_ARTIFACT: 3>]
May 30, 13:20:48 :  phantom.collect(): called with datapath as LIST of paths, scope='all' and limit=2000. Found 2 TOTAL artifacts
May 30, 13:20:48 :  phantom.custom_function(): The custom function "local/my_utility_1" is being called with parameters: [{'my_input': ['abc', '123']}]
May 30, 13:20:48 :  metrics: Playbook_id:131, run_id:33, container: 1, function: on_start. TIME_TAKEN 8ms
May 30, 13:20:48 :  Input Type: List
May 30, 13:20:48 :
[
  "abc",
  "123"
]
May 30, 13:20:48 :  metrics: Playbook_id:131, run_id:33, container: 1, function: Execute Custom Function. TIME_TAKEN 35889104ms
May 30, 13:20:48 :  CustomFunctionRun with id=21 SUCCEEDED
May 30, 13:20:48 :  Completed Custom Function run: 'my_list_utility' (id: 21)
May 30, 13:20:48 :  calling cf my_list_utility's callback function 'my_item_utility()'
May 30, 13:20:48 :  my_item_utility() called
May 30, 13:20:48 :  phantom.collect2(): called for datapath['filtered-data:filter_3:condition_1:artifact:*.cef.data_example', 'filtered-data:filter_3:condition_1:artifact:*.id'], scope: None and filter_artifacts: None
May 30, 13:20:48 :  phantom.get_run_data() called for key filtered-data:filter_3:condition_1
May 30, 13:20:48 :  phantom.get_run_data() called for key filtered-data:filter_3:condition_1
May 30, 13:20:48 :  phantom.collect2(): Classified datapaths as [<DatapathClassification.FILTERED_ARTIFACT: 3>]
May 30, 13:20:48 :  phantom.collect(): called with datapath as LIST of paths, scope='all' and limit=2000. Found 2 TOTAL artifacts
May 30, 13:20:48 :  phantom.custom_function(): The custom function "local/my_utility_2" is being called with parameters: [{'my_input': 'abc'}, {'my_input': '123'}]
May 30, 13:20:48 :  metrics: Playbook_id:131, run_id:33, container: 1, function: my_item_utility. TIME_TAKEN 45180904ms
May 30, 13:20:48 :  finished cf my_list_utility's callback function 'my_item_utility'
May 30, 13:20:48 :  Input Type: Item
May 30, 13:20:48 :  abc
May 30, 13:20:48 :  Input Type: Item
May 30, 13:20:48 :  123
May 30, 13:20:48 :  metrics: Playbook_id:131, run_id:33, container: 1, function: Execute Custom Function. TIME_TAKEN 26647984ms
May 30, 13:20:48 :  CustomFunctionRun with id=22 SUCCEEDED
May 30, 13:20:48 :  Completed Custom Function run: 'my_item_utility' (id: 22)
May 30, 13:20:48 :  cf run 'my_item_utility' did not have any callback. The custom function is now marked completed
May 30, 13:20:48 :

Playbook 'conf playbook' (playbook id: 131) executed (playbook run id: 33) on events 'test event'(container id: 1).
  Playbook execution status is 'success'
    Total actions executed: 0

May 30, 13:20:48 :  on_finish() called
May 30, 13:20:48 :  metrics: Playbook_id:131, run_id:33, container: 1, function: on_finish. TIME_TAKEN 5781272ms
```

Python Playbook Editor

splunk> .conf23

Utility Output Formatting

Standard vs Modified

1

The “outputs” variable is a dict

```
outputs = {}
```

1

The “outputs” variable is a list

```
outputs = []
```

Utility Output Formatting

Standard vs Modified

1. **The “outputs” variable is a dict**

```
outputs = {}
```

2. **Keys and values added to outputs**

```
outputs[‘fruit’] = ‘apple’
```

1. **The “outputs” variable is a list**

```
outputs = []
```

2. **Keys and values added to a dict**

```
outputs.append({‘fruit’: ‘apple’})
```

Utility Output Formatting

Standard vs Modified

1. **The “outputs” variable is a dict**
   ```
   outputs = {}
   ```
2. **Keys and values added to outputs**
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   outputs[‘fruit’] = ‘apple’
   ```
3. **Output paths are var names**
   ```
   fruit
   ```

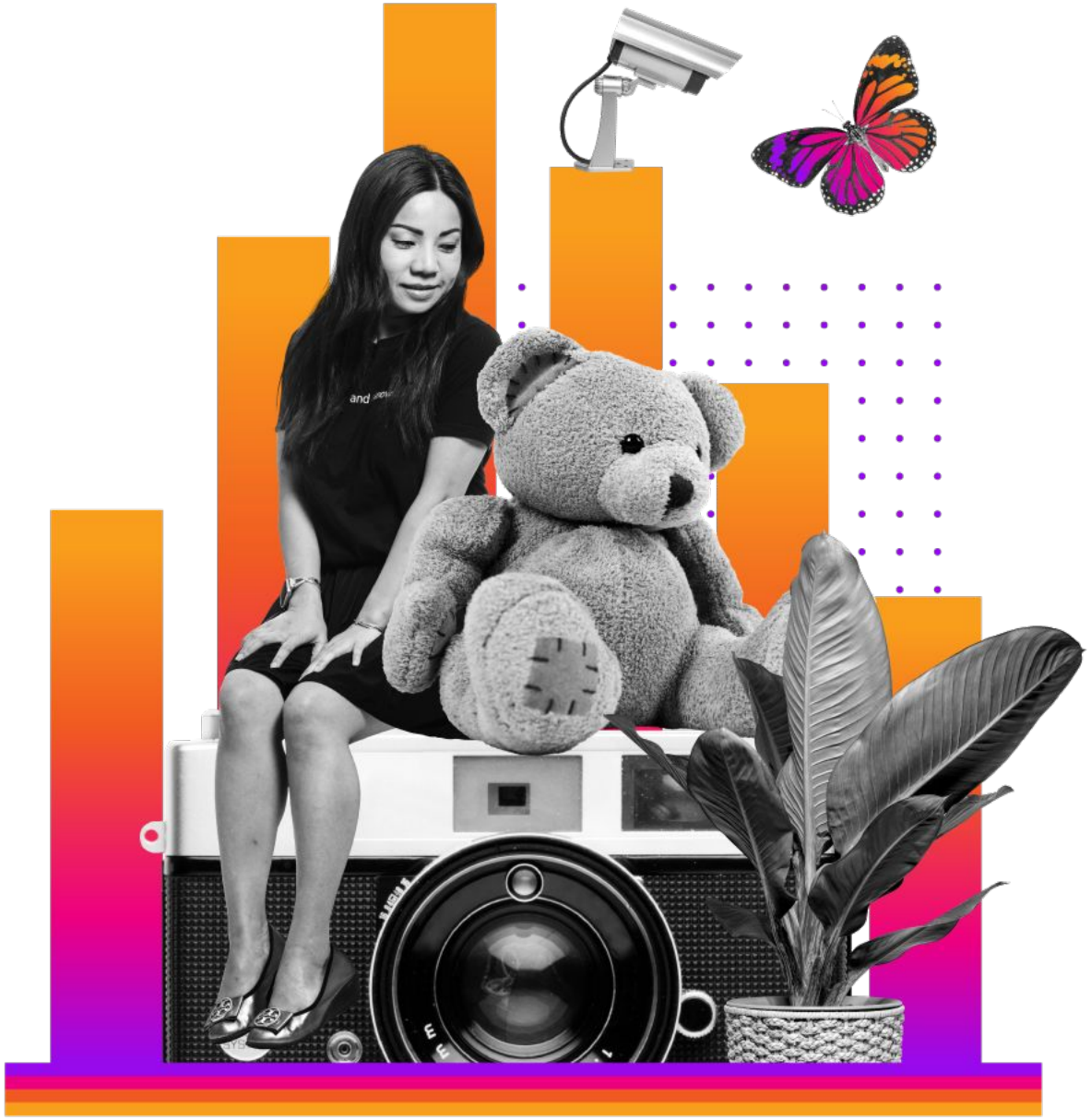
1. **The “outputs” variable is a list**
   ```
   outputs = []
   ```
2. **Keys and values added to a dict**
   ```
   outputs.append({‘fruit’: ‘apple’})
   ```
3. **Output paths are *. var names**
   ```
   *.fruit
   ```

Utility Output Formatting

Standard vs Modified

1. **The “outputs” variable is a dict**
   `outputs = {}`
2. **Keys and values added to outputs**
   `outputs[‘fruit’] = ‘apple’`
3. **Output paths are var names**
   `fruit`
4. **Datapaths point to the literal values**
   ‘apple’

1. **The “outputs” variable is a list**
   `outputs = []`
2. **Keys and values added to a dict**
   `outputs.append({‘fruit’: ‘apple’})`
3. **Output paths are *. var names**
   `*.fruit`
4. **Datapaths point to list of values**
   `[‘apple’, ‘banana’, ‘cherry’, ‘durian’]`



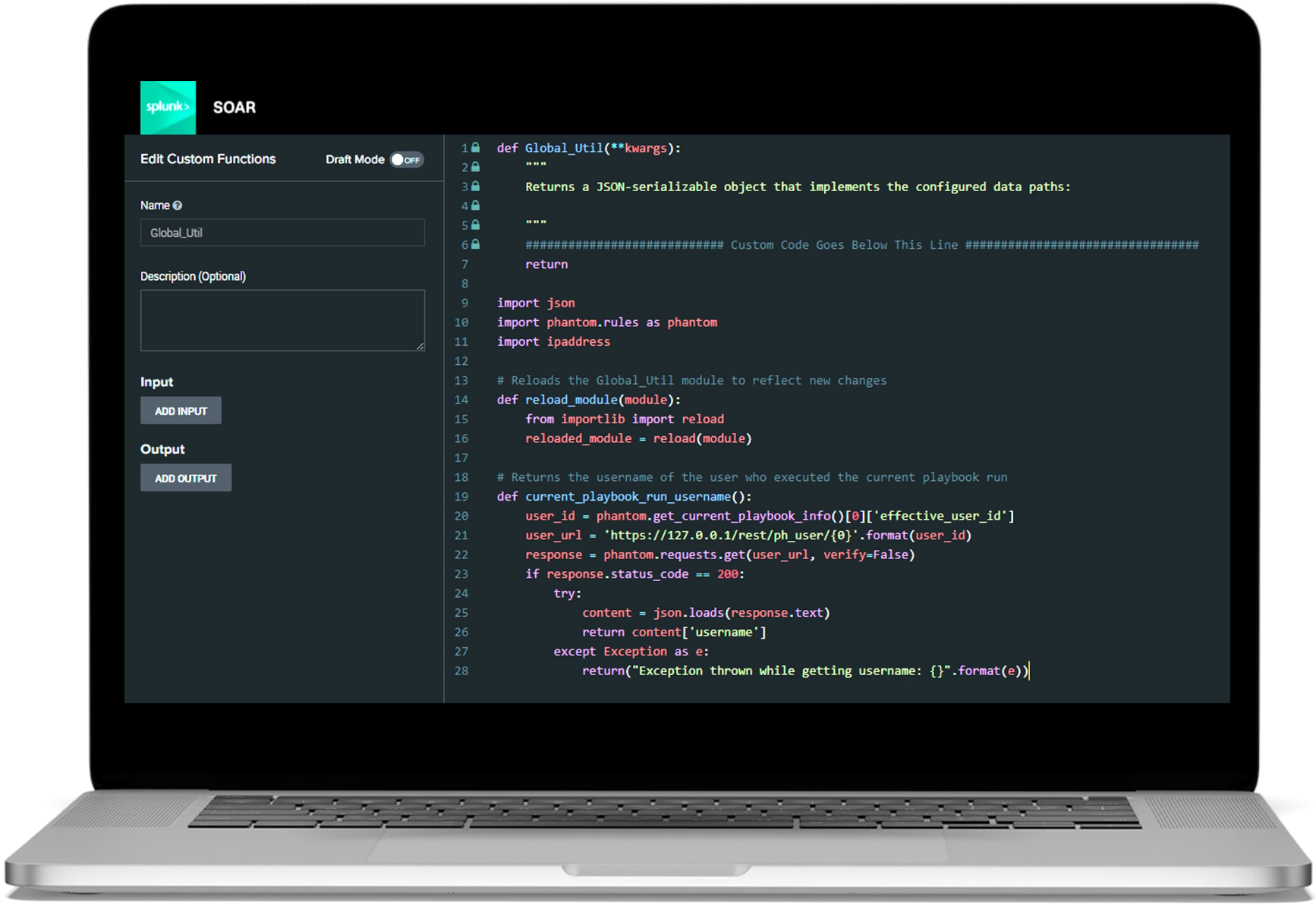
Global Utilities

Let’s get a little crazy

splunk> .conf23

Hijacking a Utility Block

- Don’t cross the streams



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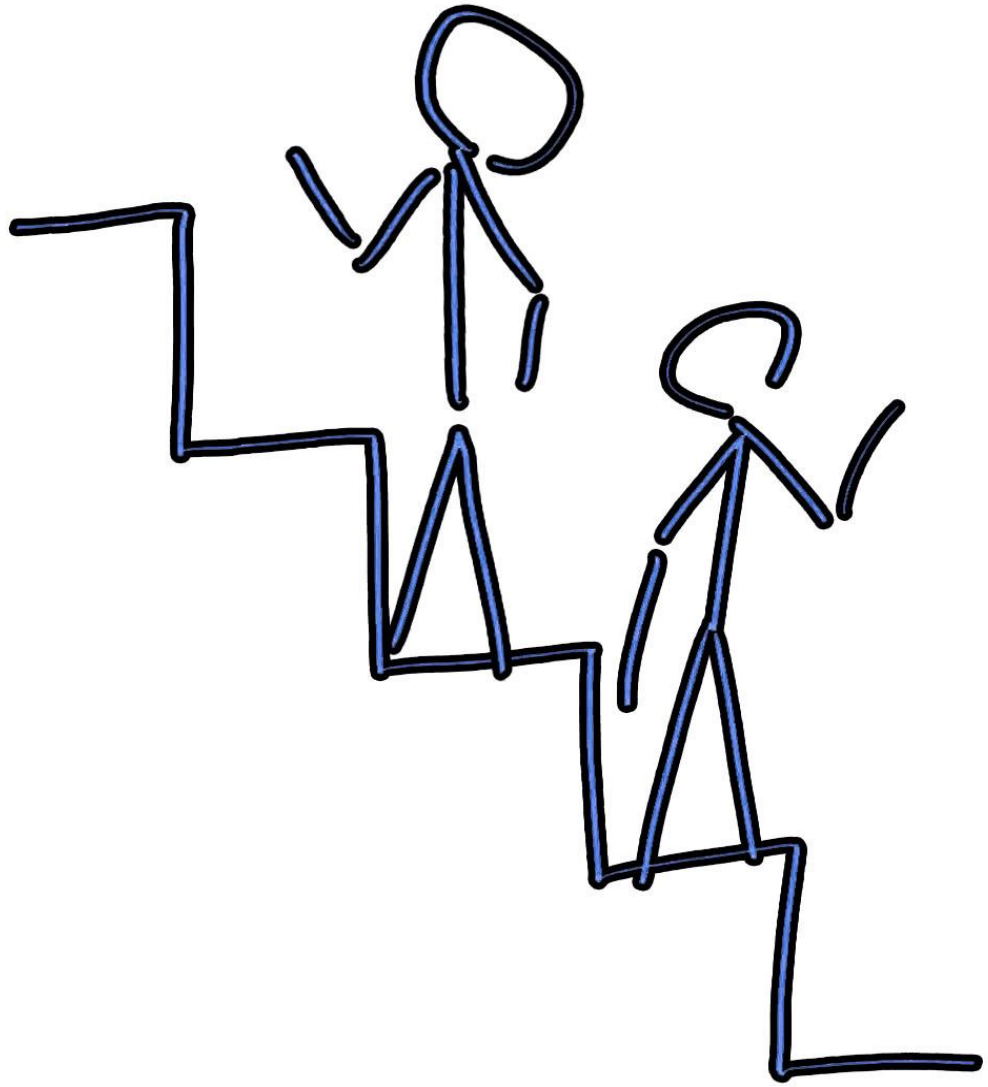


.conf23 Learning Quest

Explore all .conf23 has to offer!

SCAN ME in the .conf23 mobile app game

splunk> .conf23

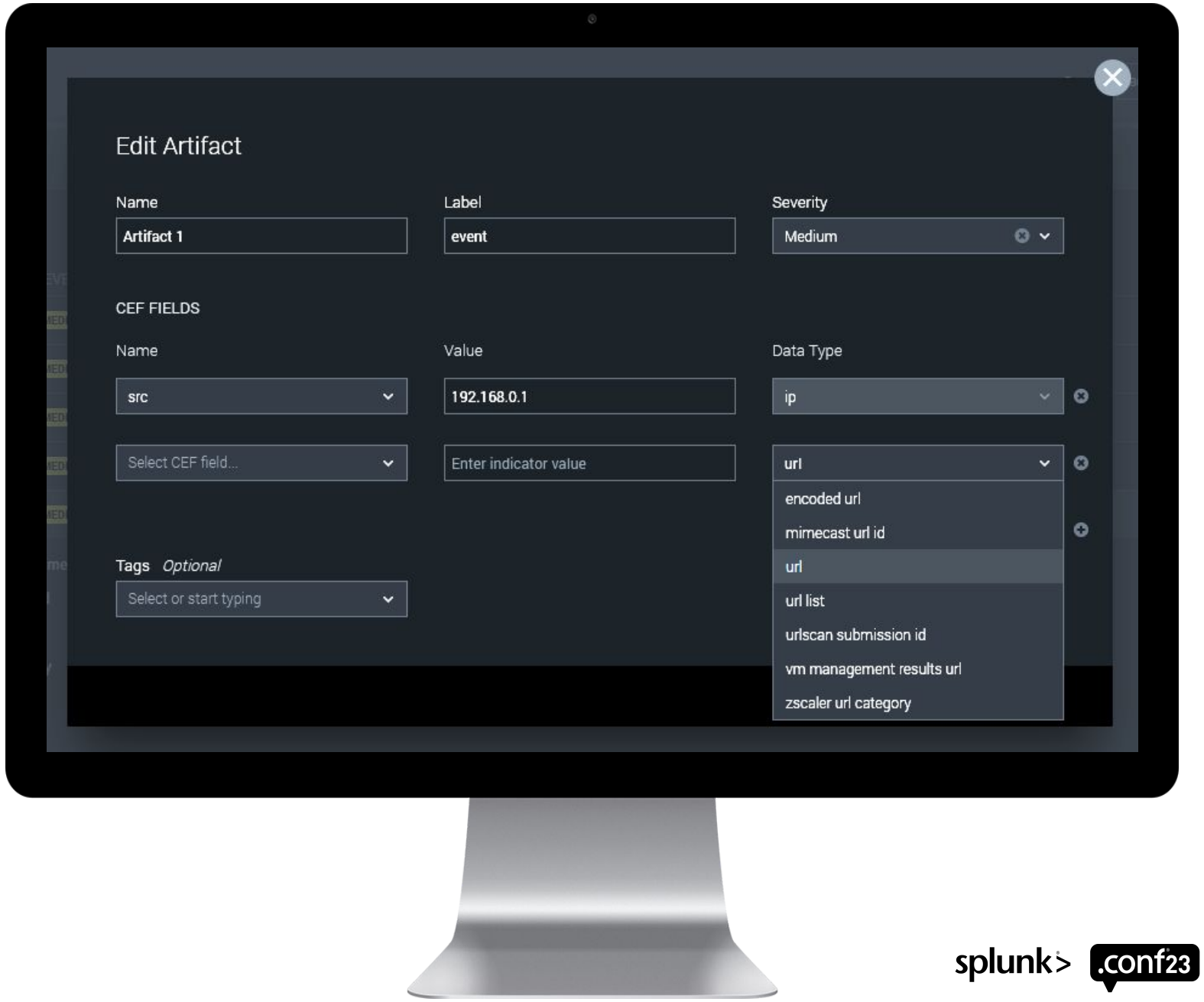
Thank You

phantom_mhike Git repo

splunk> .conf23

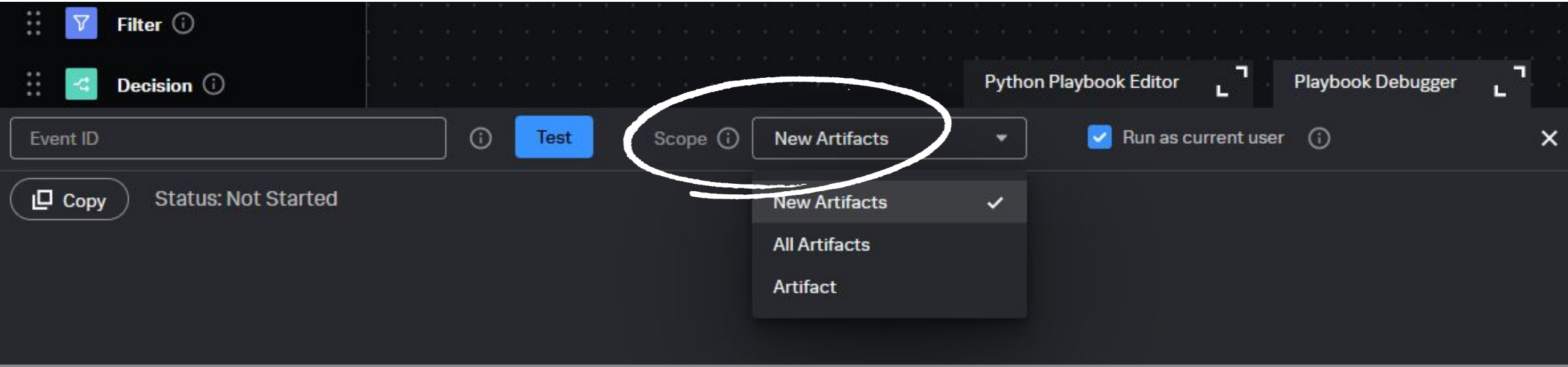
Data Type

- Contextual Actions
  - Example: the drop-down arrow next to the field value in an artifact
- Associates a given field with app-configured action input types

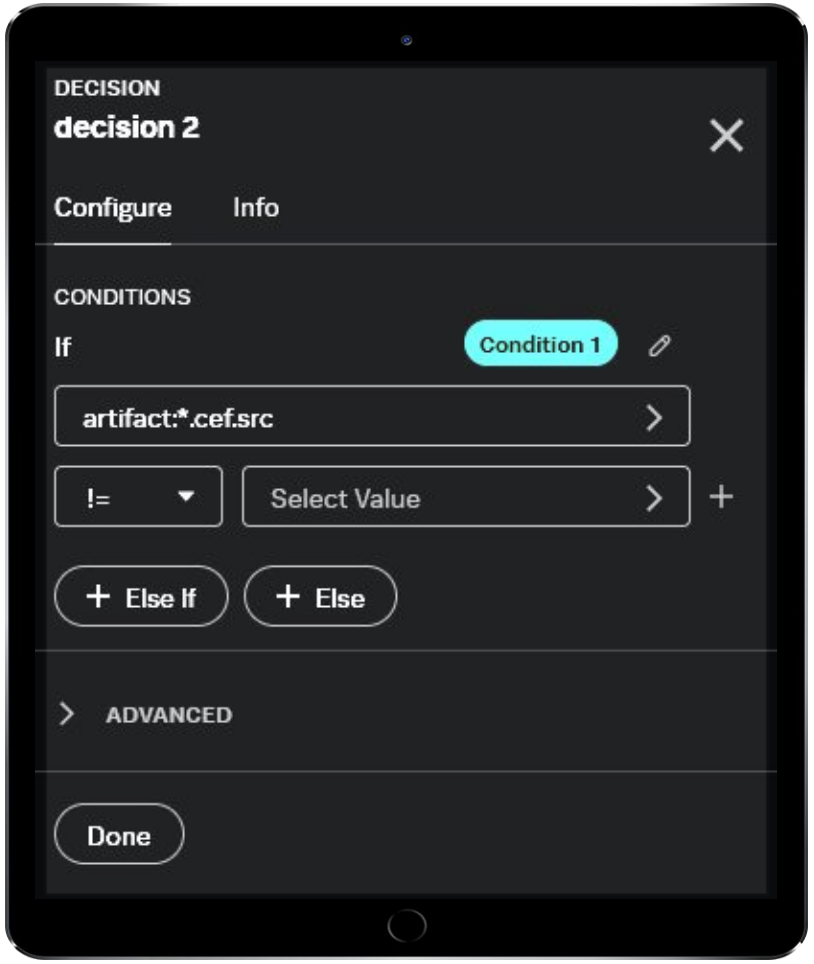


Mind the Scope!

Why did your playbook only work the first time?



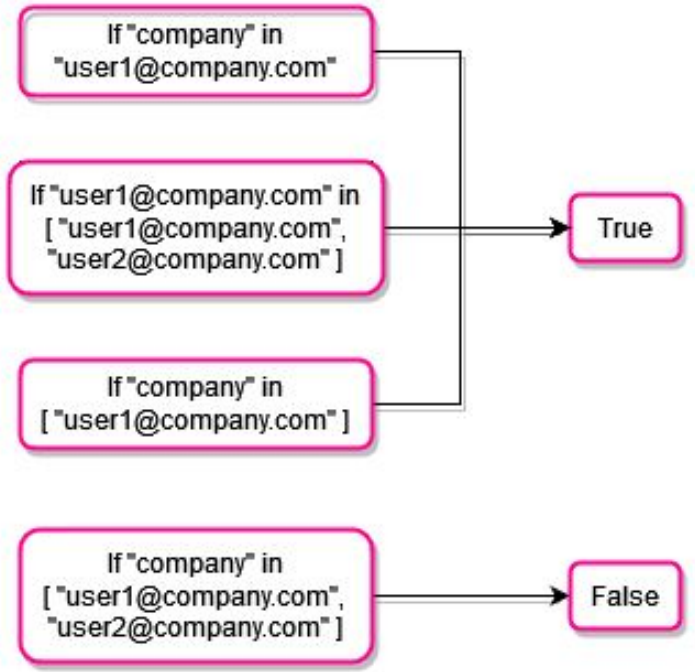
Decision Examples



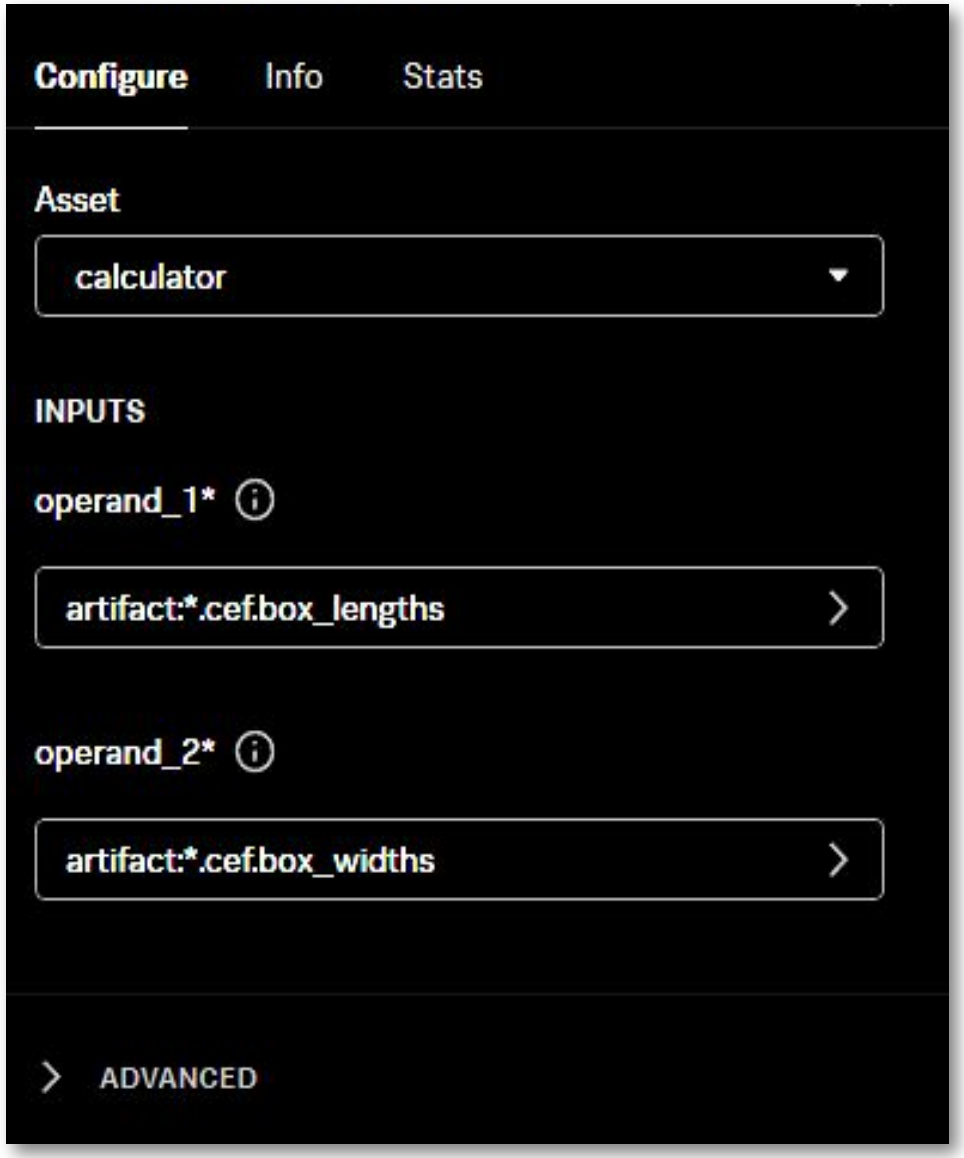
Proceed only if the given field exists

Be aware of how lists are processed

- Strings and Multi-element Lists are processed the same as they are in Python
- Splunk SOAR does you a favor with Single-element Lists (sometimes confusing)



splunk> .conf23



So You Would Think…

But it doesn't work like that

More than one multi-valued input in an action will nest those inputs instead of generating tuples

2x multi-valued inputs with 3 values each will execute this action 9 times

Technically your data will be there because every combination of fields will be executed

```
for length in artifact:*.cef.box_lengths:
    for width in artifact:*.cef.box_widths:
        RunAction(length, width)
```