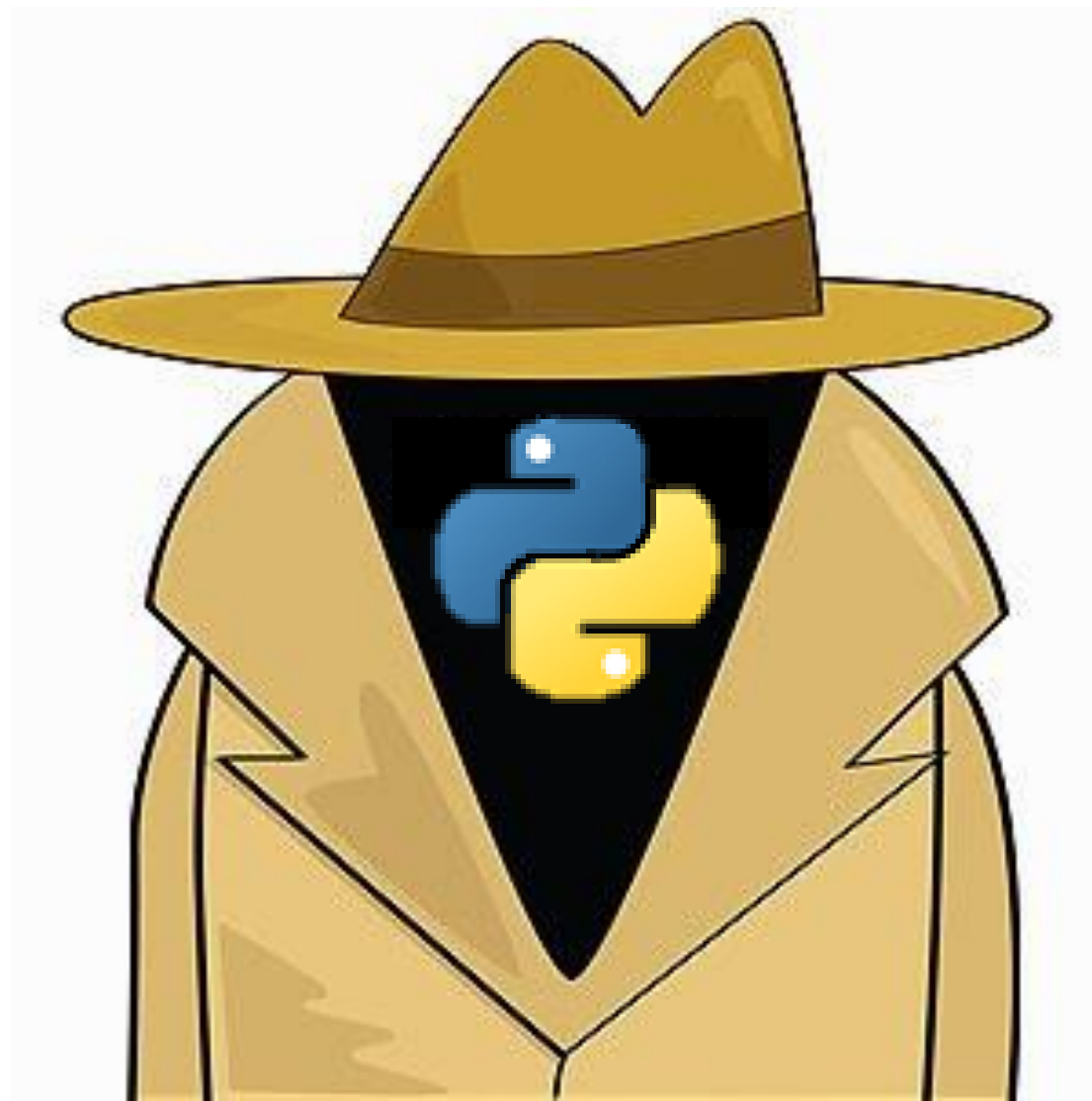


# Field Calculator

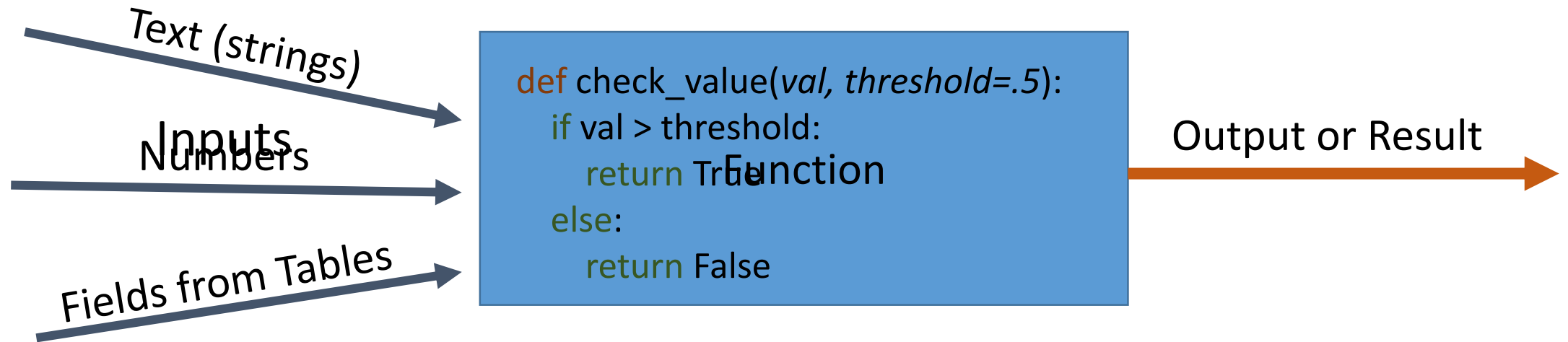
The things your instructor never told you about ArcGIS

# Secretly a Python Tutorial

- (shhh!)



# Remember Functions?



Geoprocessing tools can be thought of as functions  
We can also make our own functions for field calculations

# Variables

## General Form

`variable_name = "value"`



Value on right  
assigned to  
name on left

*List* `many_values = ["list", "of",  
"values"]`

Expression	Result
<code>viewers[0]</code>	student1
<code>student_names["student1"]</code>	Jennifer
<code>student_names[viewers[1]]</code>	Dan
<code>student_names[viewers[0]]</code>	Jennifer

## Example

```
webinar_name = "Intro to Field  
Calculator"
```

```
presenter = "Nick Santos"
```

```
viewers = [  
    "student1", "student2",  
    "student3", "student4"  
]
```

```
student_names = {  
    "student1": "Jennifer",  
    "student2": "Dan"  
}
```

# Conditionals

## General Form

```
if {condition evaluates to true}:  
    {run some code}  
else: # condition is false  
    {run different code}
```

## Example

```
if value > threshold:  
    return True  
else:  
    return False
```

# Bringing it all together

INTENSITY	BURN_RATE	SEVERITY
2	1	Medium
2	2	High
1	1	Low
1	4	Extreme
5	1	Extreme

## Code Block:

```
def get_severity(intensity, burn_rate):  
    severities = { 1: "Minimal", 2: "Low",  
                  3: "Medium", 4: "High",  
                  5: "Extreme"}  
    base_severity = intensity + burn_rate  
  
    if base_severity > 5:  
        base_severity = 5  
  
    return severities[base_severity]
```

## Expression:

SEVERITY=get\_severity(!INTENSITY!, !BURN\_RATE!)

*becomes*

```
get_severity(2, 1)  
get_severity(2, 2)  
get_severity(1, 1)  
get_severity(1, 4)  
get_severity(5, 1)
```

Demos

# Four conditions

	Catchment Area > 1km	Catchment Area < 1km
Elevation > 2500 m	High altitude, high flow	High altitude, low flow
Elevation < 2500 m	Low altitude, high flow	Low altitude, low flow



Catchment Area	Elevation	
> 1 km	> 2500 m	High altitude, high flow
	< 2500 m	Low altitude, high flow
< 1 km	> 2500 m	High altitude, low flow
	< 2500 m	Low altitude, low flow