```
String message = "Hello, Groovy!"
int age = 25
double pi = 3.14
boolean isGroovy = true
List<Integer> numbers = [1, 2, 3, 4, 5]
Map<String, Object> person = [name: "John", age: 30, city: "New York"]
```

```
def greet(name) {
    println("Hello, $name!")
}

// Call the function
greet("Alice")
```

Scripting, workflows and batch processing

```
// Iterate over a range of numbers
for (int i = 0; i < 5; i++) {
    println("Index: $i")
}
```

```
def count = 0

while (count < 5) {
    println("Count: $count")
    count++
}
```

Scripting in QuPath

- QuPath uses **Groovy**, a scripting language with Java-like syntax
- Some **fun** facts about Groovy:
  - Created by James Strachan in 2003
  - Open-source (under the Apache License 2.0)
  - Groovy is a superset of Java and its syntax is Java-like
  - Bonus: dynamically typed (vs Java being statically typed)

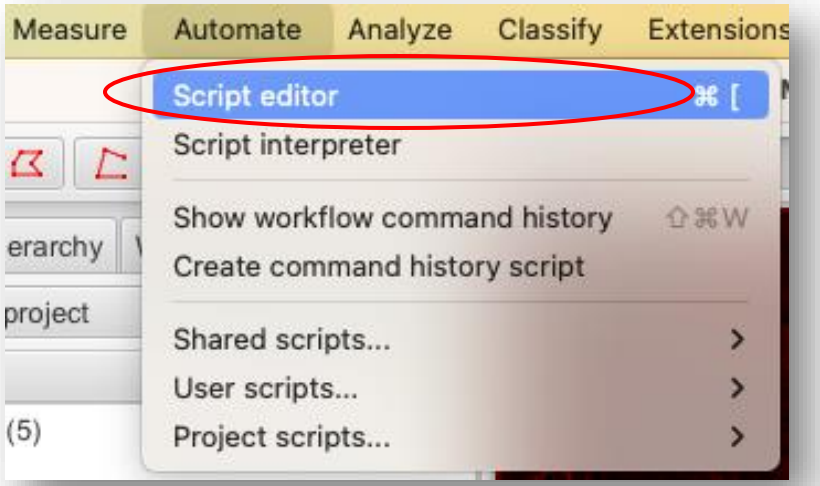
groovy

```groovy
// Iterate over a range of numbers
for (int i = 0; i < 5; i++) {
    println("Index: $i")
}
```

for *loop in Groovy*

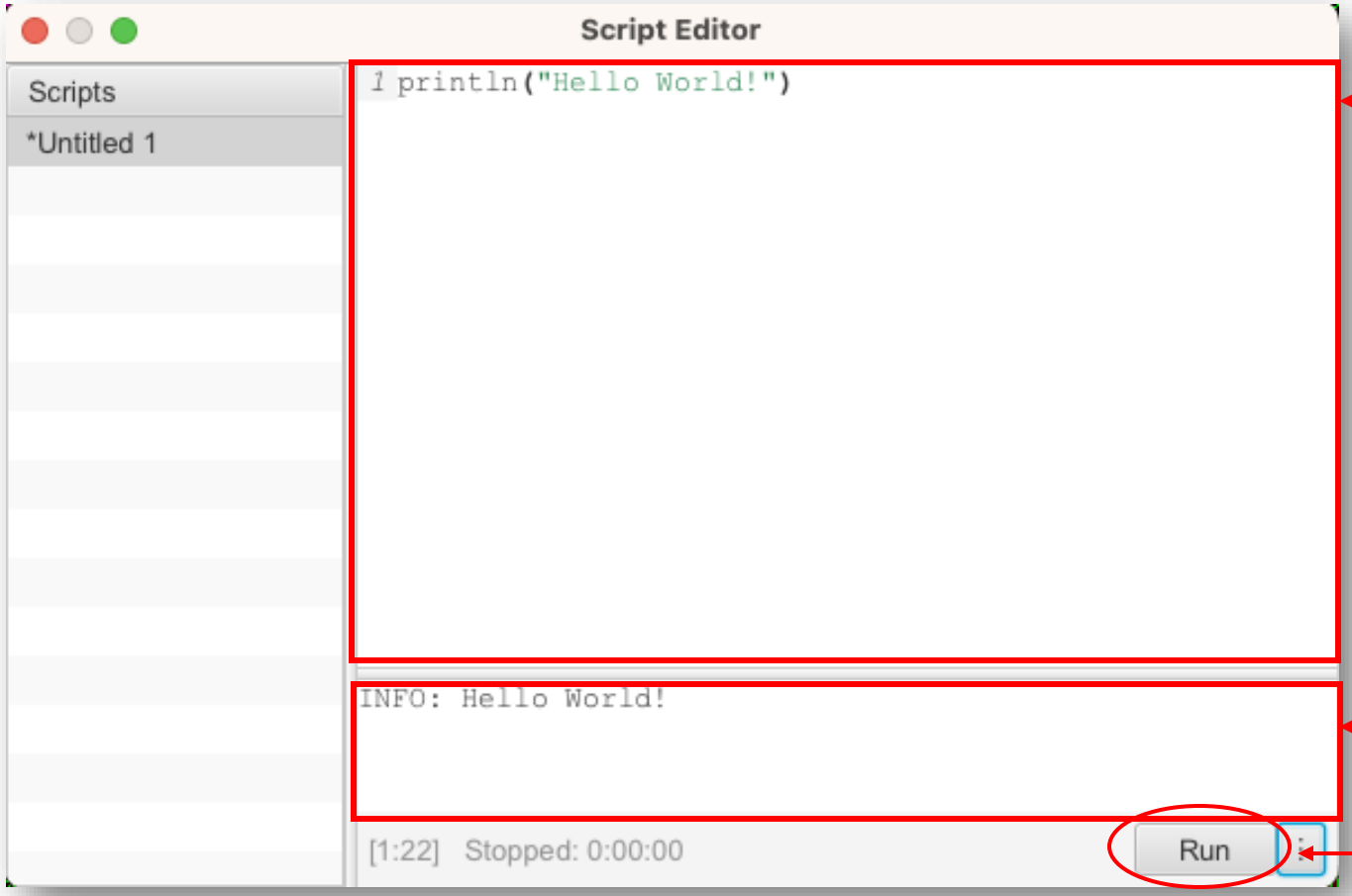
Scripting in QuPath

- *Automate > Script editor*



Hello World!

- *Automate > Script editor*

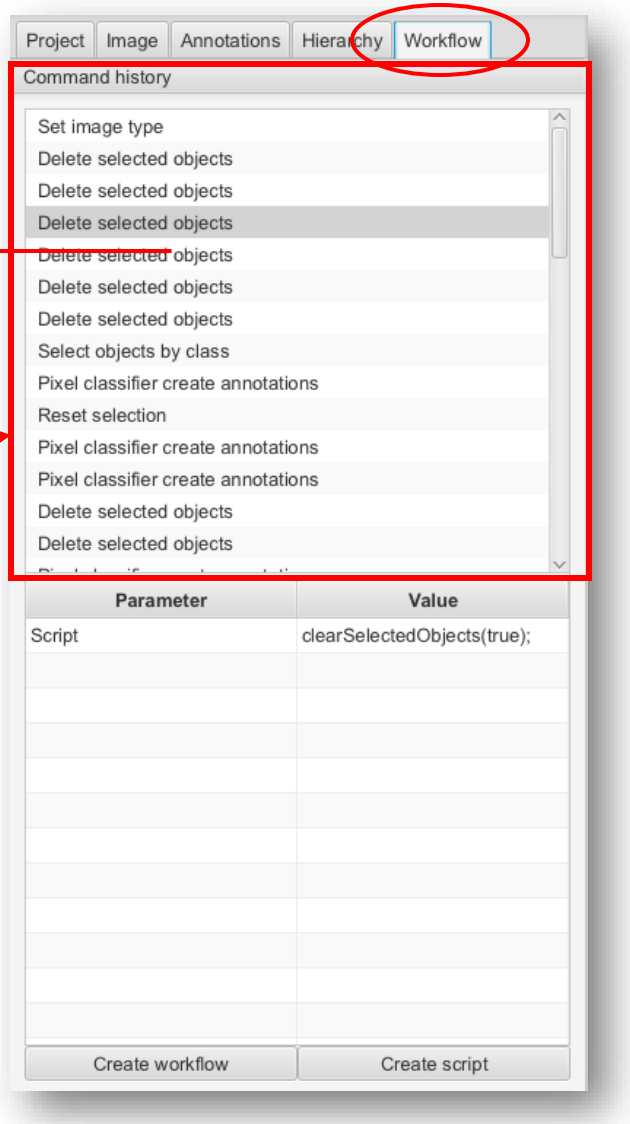


Automate your workflows without coding

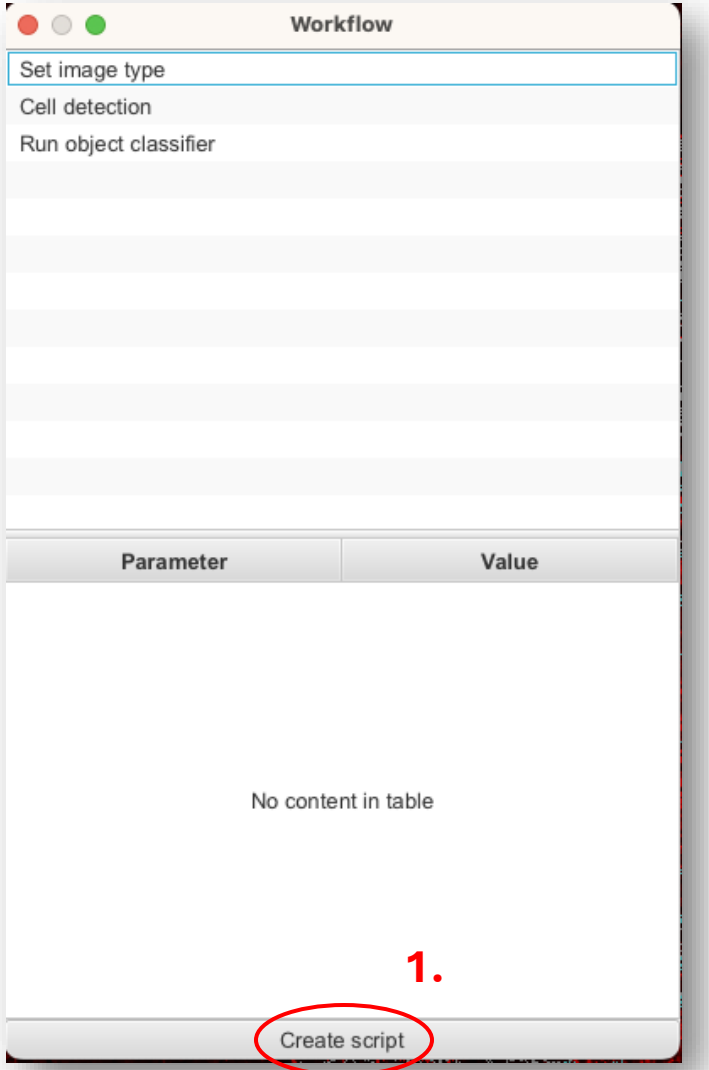
QuPath uses **Workflows** to represent sequences of steps that have been applied to an image (commands run but also the parameters used).

- *Analysis panel* > *Workflow* tab

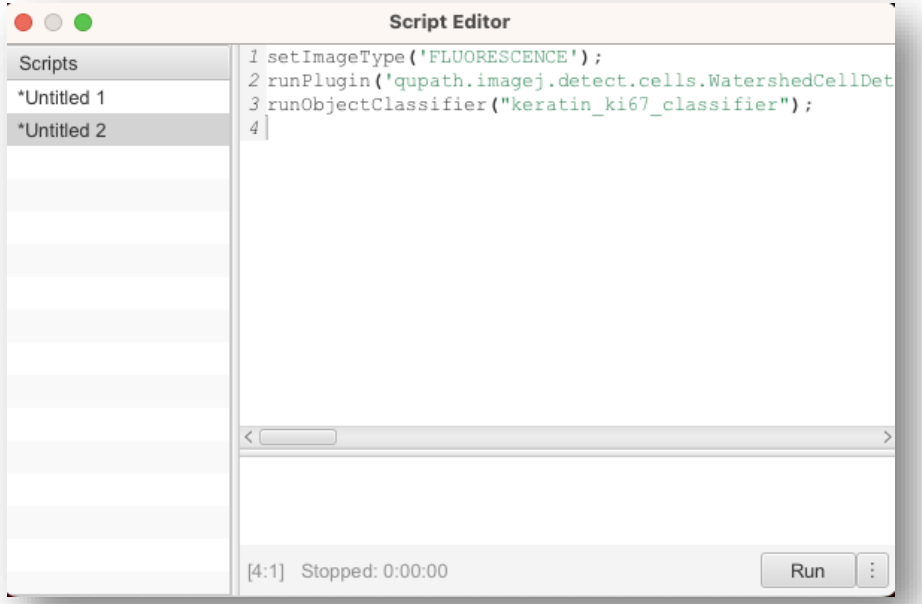
- The *Command history* is a record of most processing that has been done to the currently open image

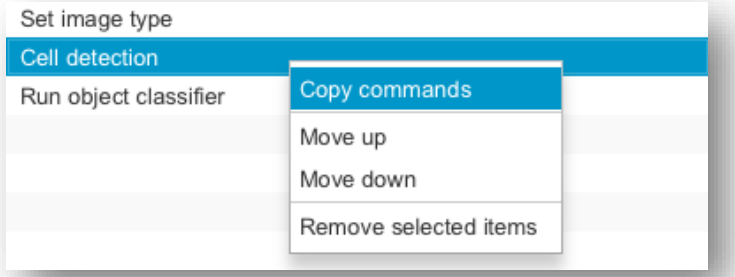


Clean your workflow for cell detection and classification



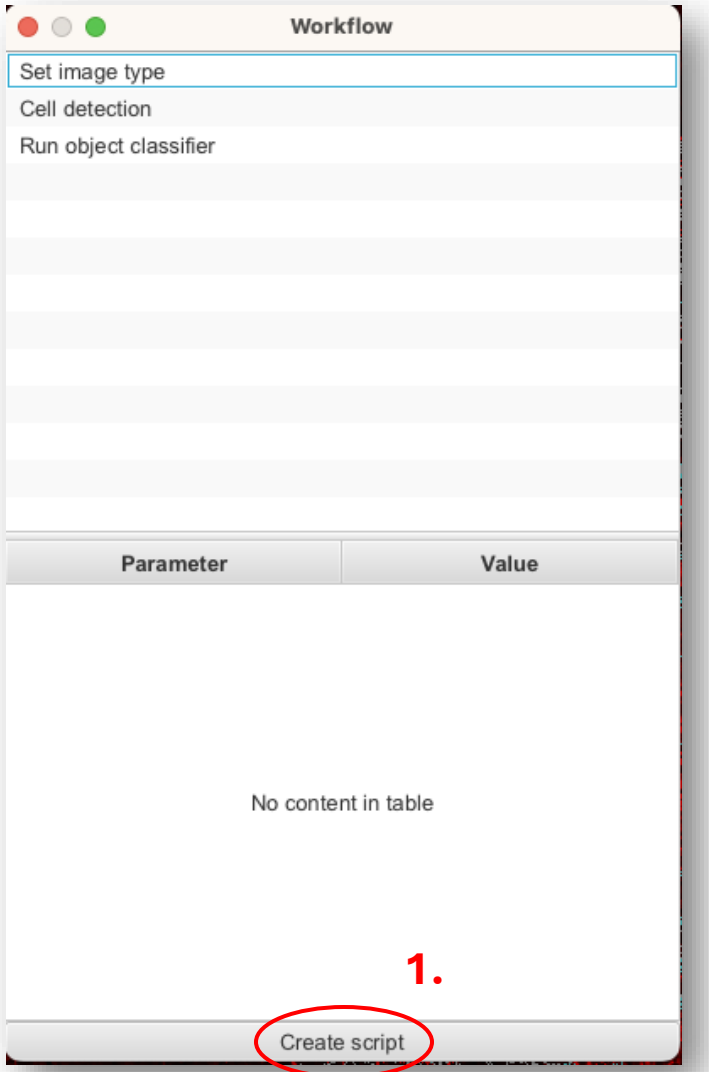
2.

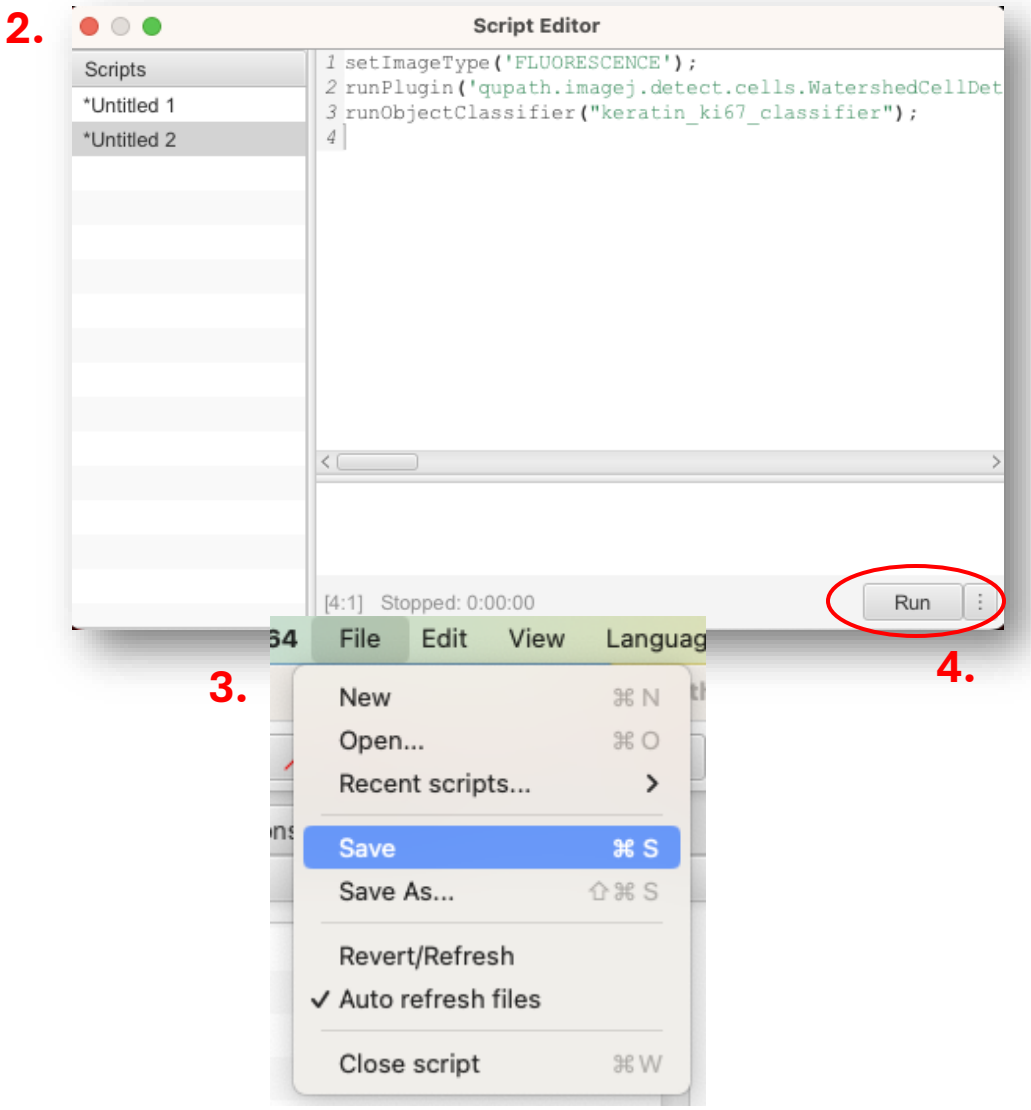




Edit the sequence of steps in the workflow using right-click

Save and run a script

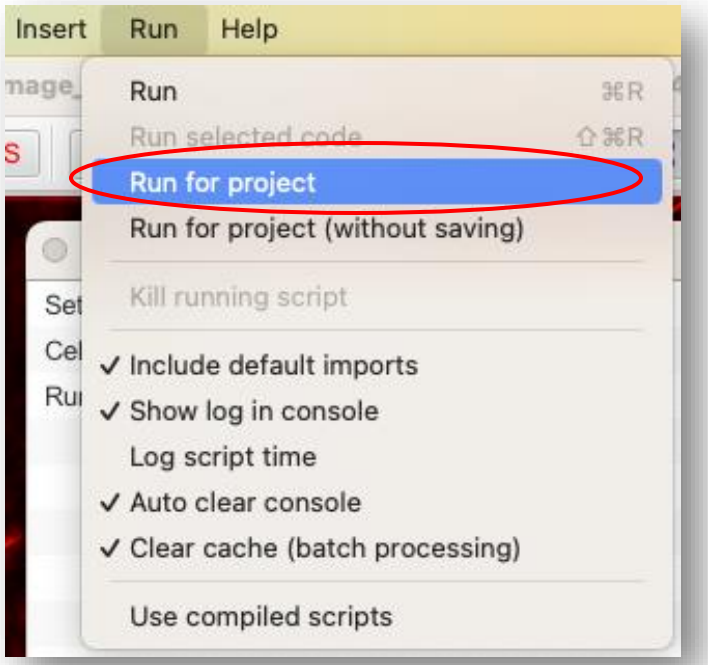


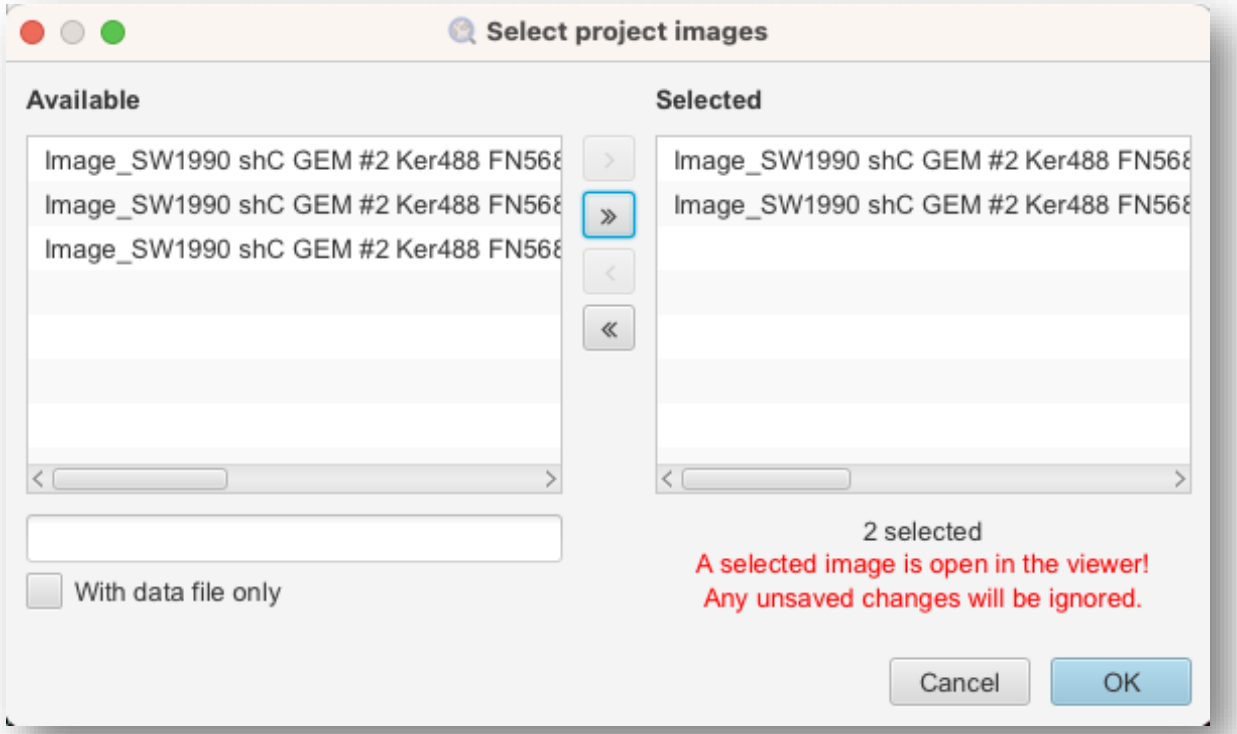


Scripts can be repeated on a batch of images

QuPath allows for batch processing: scripts will run on multiple images loaded in the project.

- *Run > Run for project*



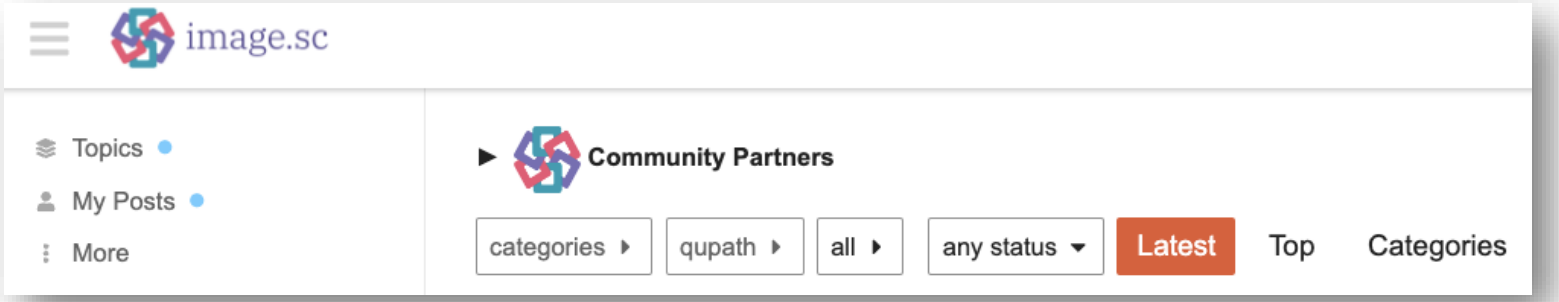


Select images you wish to run the script on.

Further resources

- QuPath documentation
  - Scripting: https://qupath.readthedocs.io/en/latest/docs/scripting/overview.html
  - QuPath's API docs: https://qupath.github.io/javadoc/docs/

- The Forum
  - Where to contact the developers of most image analysis tools
  - If you have a question, likely someone else already asked



QuPath on O2

Ranit Karmakar