ROBOT Tutorial Commands

Getting Started

Optionally, update your ROBOT version to **v1.2.0-alpha (link)**. Download the JAR and replace your existing `robot.jar` file with the new one.

Make sure you have downloaded the **tutorial repository (link)** and open the `examples` directory in the command line.

If you do not yet have ROBOT downloaded, download the JAR above and move it to a folder (e.g. `~/robot`). Then, navigate to this folder in the command line and follow the appropriate steps for your operating system. If you do not wish to download ROBOT and you have Docker installed, scroll down to the Docker instructions.

Mac & Linux

First, run the following command (in the same folder as `robot.jar`):

```
curl https://raw.githubusercontent.com/ontodev/robot/v1.2.0-alpha-1/bin/robot \
 > robot
```

This will create the script file necessary for running the JAR.

Then, update your `PATH` variable:

1. Enter `pwd` to get the *full* path of the ROBOT folder and copy it
2. Enter `cd`
3. Enter `open .bash_profile`
4. Add `ROBOT_HOME=<full path>` (replace `<full path>` with the copied path) above the `export PATH` line
5. Add `:$ROBOT_HOME` to the end of the `export PATH` line and save the file
6. Enter `source .bash_profile`
7. Enter `robot version` to verify

Windows

First, run the following command (in the same folder as `robot.jar`):

```
echo java -jar %~dp0robot.jar %* > robot.bat
```

This will create the script file necessary for running the JAR.

Then, update your environment variable by following **these instructions (link)**. Open a new command prompt, and enter `robot version` to verify.

Docker

The `robot-tutorial` repository includes a `docker.sh` file. Simply run the following command to start a new Docker environment with ROBOT v1.1.0:

```
sh docker.sh
```

After the environment is up and running, just navigate to the `examples` directory. Enter `robot version` to verify.

ROBOT for Repetitive Tasks

Merge

Merge Separate Ontologies

```
robot merge --input edit.owl \
  --input foo.owl \
  --output results/merged.owl
```

Merge Imports

```
robot merge --input with-import.owl \
  --output results/merged_imports.owl
```

Reason

Logical Validation

```
robot reason --input unsatisfiable.owl
```

Automatic Classification

```
robot reason --input non-reasoned.owl \
  --output results/reasoned.owl
```

Annotate

Add Metadata

```
robot annotate --input edit.owl \
  --version-iri \
    https://github.com/ontodev/robot/releases/2018-08-07/edit.owl \
  --annotation oboInOwl:date "08:07:2018 12:00" \
  --output results/annotated.owl
```

Convert

Convert the Edit File

```
robot convert --input edit.owl \
  --format owl \
  --output results/release.owl
```

Convert to OBO

```
robot convert --input edit.owl \
  --output results/release.obo
```

Automated Workflows

Chaining Commands

```
robot merge --input edit.owl --collapse-import-closure true \
  reason --reasoner ELK \
  annotate --version-iri http://purl.obolibrary.org/obo/robot/2018-08-07/release.owl \
  convert --output results/chained_release.ttl
```

Makefiles

```
make release
```

Quality Assurance

Diff

Compare Axioms

```
robot diff --left non-reasoned.owl \
  --right reasoned.owl \
  --output results/diff.txt
```

Query

Select Query

```
robot query --input edit.owl \
  --query select.rq results/select.tsv
```

Ask Query

```
robot query --input edit.owl \
  --query ask.rq results/ask.txt
```

Verify

Successful Verification

```
robot verify --input edit.owl \
  --queries verify.rq \
  --output-dir results
```

Unsuccessful Verification

```
robot verify --input edit.owl \
  --queries verify_fail.rq \
  --output-dir results
```

Report

Generate a Report

```
robot report --input edit.owl --output results/report.tsv
```

Modular Development

Extract

Extract with SLME

```
robot extract \
  --input-iri http://purl.obolibrary.org/obo/obi.owl \
  --term OBI:0000443 \
  --method BOT \
  --output results/obi_bot.owl
```

Extract with MIREOT

```
robot extract \
  --input-iri http://purl.obolibrary.org/obo/obi.owl \
  --method MIREOT \
  --lower-terms obi_terms.txt \
  --output results/obi_mireot.owl
```

Template

Create a Module

```
robot template --input edit.owl \
  --template module.tsv \
  --ontology-iri http://purl.obolibrary.org/obo/robot/module.owl \
  --output results/module.owl
```

Add a Class to an Ontology

```
robot template --input edit.owl --merge-before \
  --template new_class.tsv \
  --output results/new_class.owl
```

Modular Releases

Querying with SPARQL CONSTRUCT

Update Annotations with CONSTRUCT

```
robot query --input edit.owl \
  --query construct.rq results/construct.ttl
```

```
robot merge --input edit.owl \
  --input results/construct.ttl \
  --output results/update.owl
```

Remove

Remove a Class + Descendants

```
robot remove --input edit.owl \
  --term UBERON:0000475 \
  --select "self descendants" \
  --output results/removed.owl
```

Create a 'Simple' Version

```
robot remove --input edit.owl \
  --axioms equivalent \
  remove --select parents --select anonymous --select imports \
  --output results/simple.owl
```

Filter

Extract a Branch

```
robot filter --input edit.owl \
  --term UBERON:0000475 \
  --select "self descendants annotations" \
  --output results/branch.owl
```

Create a Subset

```
robot filter --input edit.owl \
  --select \
  "oboInOwl:inSubset=<http://purl.obolibrary.org/obo/uberon/core#uberon_slim>" \
  --select annotations \
  --output-iri http://purl.obolibrary.org/robot/uberon_slim.owl
  --output results/uberon_slim.owl
```