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, or do not have the most recent version, you can start a Docker environment by following the instructions below. Alternatively, if you want to install ROBOT, 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 (below the Docker instructions).

Docker

The `robot-tutorial` repository includes a `docker.sh` file. Simply run the following command to start a new Docker environment with ROBOT v1.2.0-alpha:

```
sh docker.sh
```

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

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.

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
```