Robot Framework

https://robotframework.org/

Robot Framework

- Development started with Pekka Klärck's master's thesis in 2005
- The first version was developed the same year by Nokia Networks
- Written in the Python
- Open source automation framework
- Currently the development is continued by Robot Framework Foundation

Robot Framework

- Said: Robot Framework has an easy syntax, utilizing human-readable keywords.
- Can be extended by libraries with Python, Java etc.

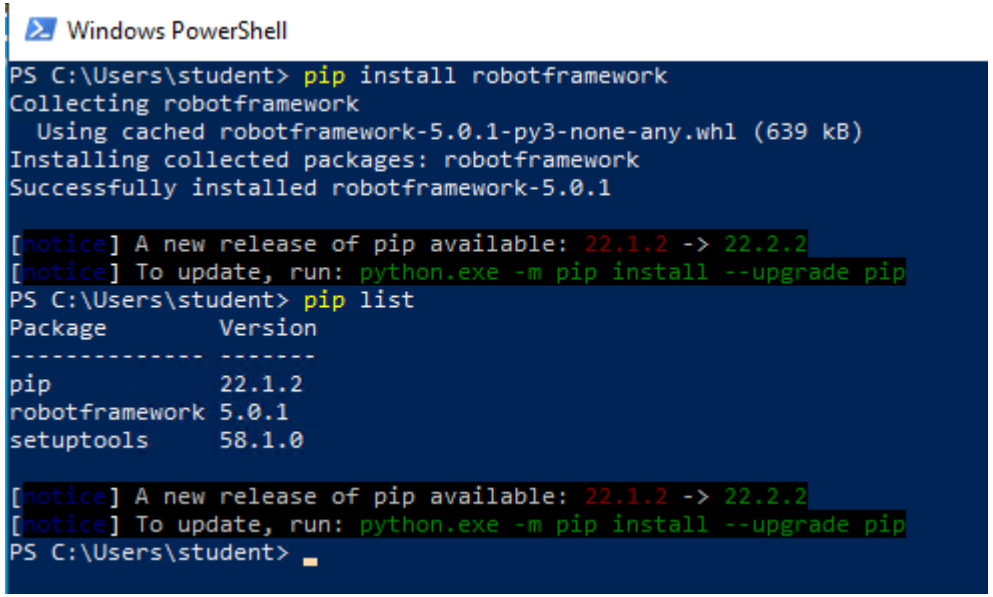
Good Stuff

- User Guide: https://robotframework.org/robotframework/latest/RobotFrameworkUserGuide.html
- BuiltIn Library: https://robotframework.org/robotframework/latest/libraries/BuiltIn.html
- Standard Libraries: https://robotframework.org/robotframework/#standard-libraries
- Selenium Library: https://robotframework.org/SeleniumLibrary/SeleniumLibrary.html

Install Robot Framework

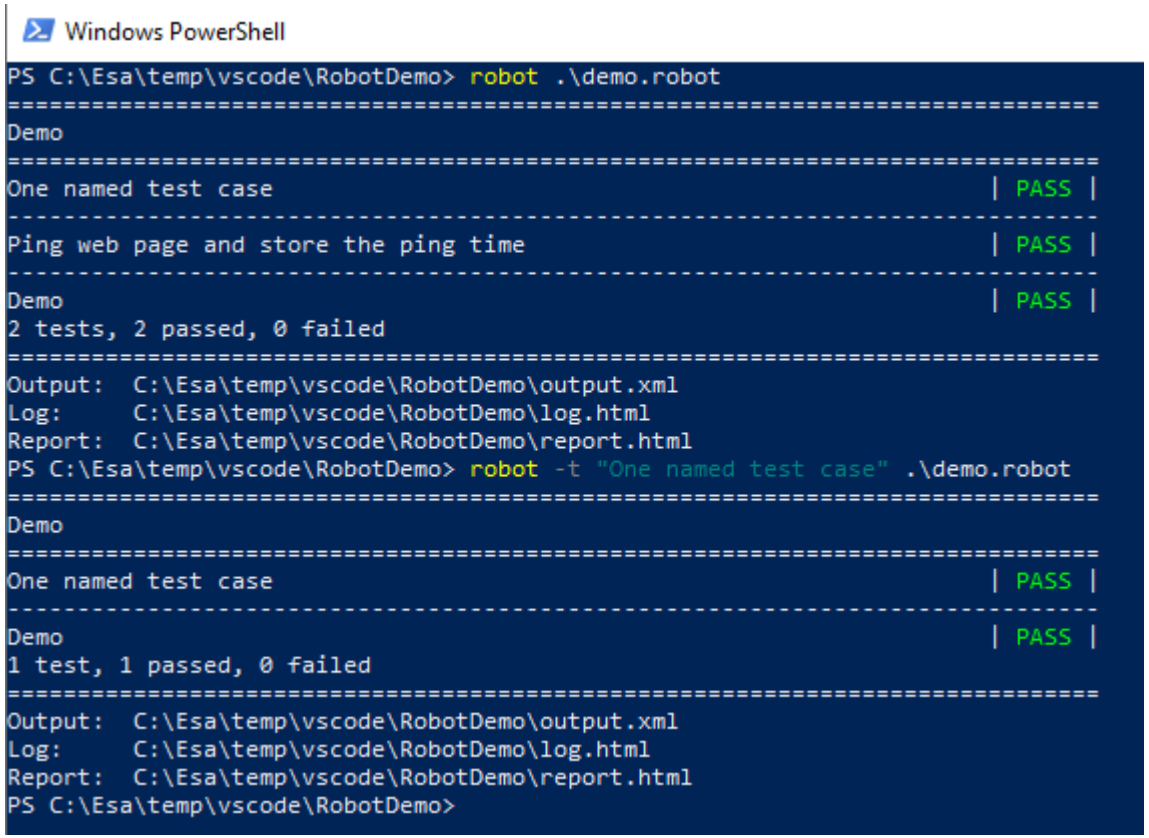
- Python must be installed
- Open PowerShell
- Command:

  pip install robotframework



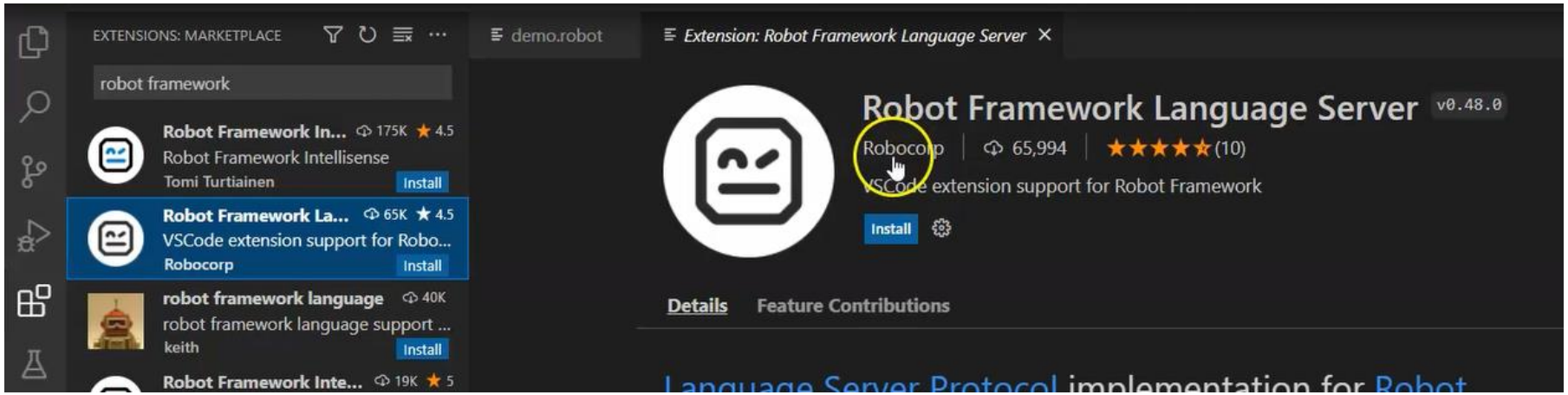
Run Robot Files

- All tests from file
- Single test from file



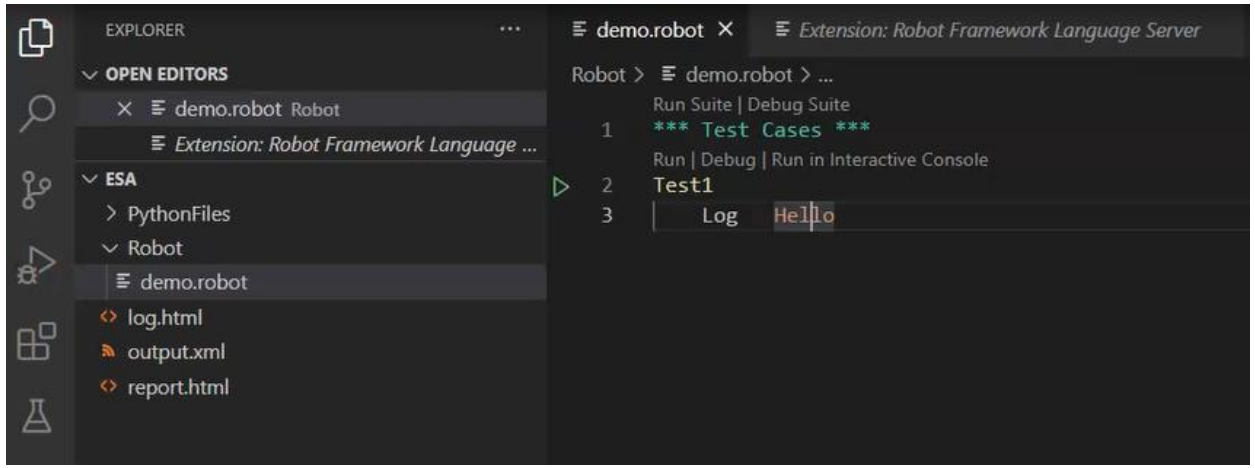
VSCode Extension

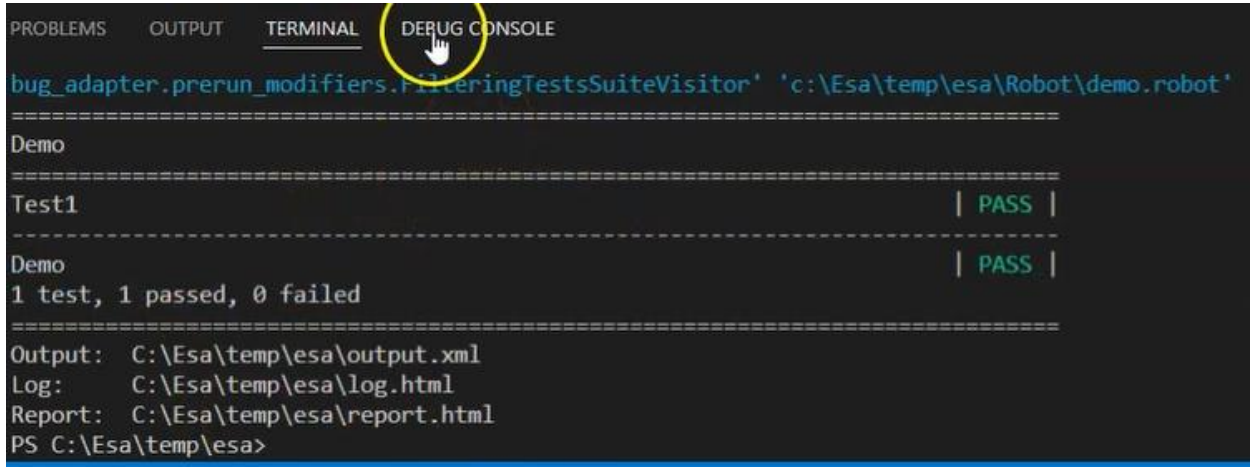
- Robot Framework Language Server



VSCode Extension

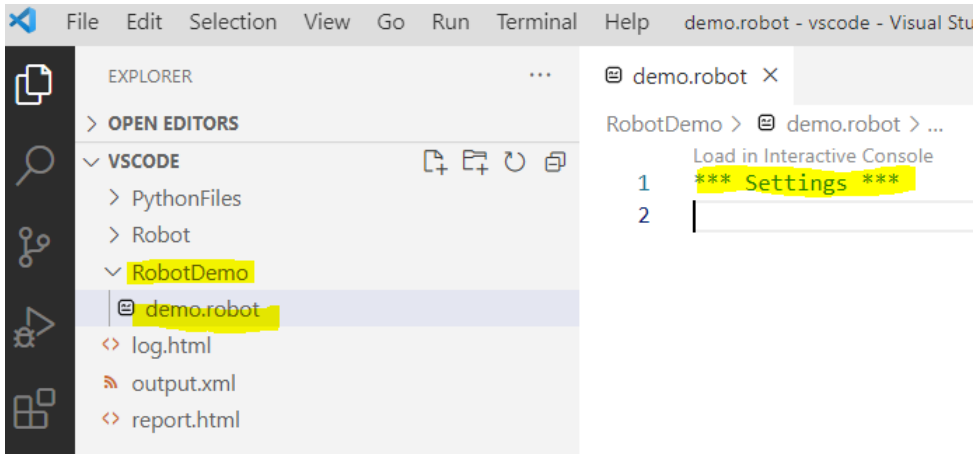
- Tiedostopääte .robot
- VSCode
  - Koodin väritys
  - Run-pikanapit





Start

- Create New Folder
- Create New File demo.robot
  - .robot –extension
- Start typing *S
  - Autocomplete to *** Settings ***



Sections

- Settings
  - Import libraries
- Variables
  - Create global variables
- Keywords
  - Create own keywords
- Test Cases
  - Create test cases

General

- Section headers are surrounded 3 *
  - *** Test Cases ***
- Between Keyword and argument there are 3 whitespaces
  - VSCode understands <tab> also

Variable And 1st Test Case

- Run by clicking ”Run Suite”
- Outcome in terminal

```
==============================================================================
Demo
==============================================================================
Check outcome                                                         | PASS |
------------------------------------------------------------------------------
Demo                                                                  | PASS |
1 test, 1 passed, 0 failed
==============================================================================
Output:  C:\Esa\temp\vscode\output.xml
Log:     C:\Esa\temp\vscode\log.html
Report:  C:\Esa\temp\vscode\report.html
PS C:\Esa\temp\vscode>
```

demo.robot

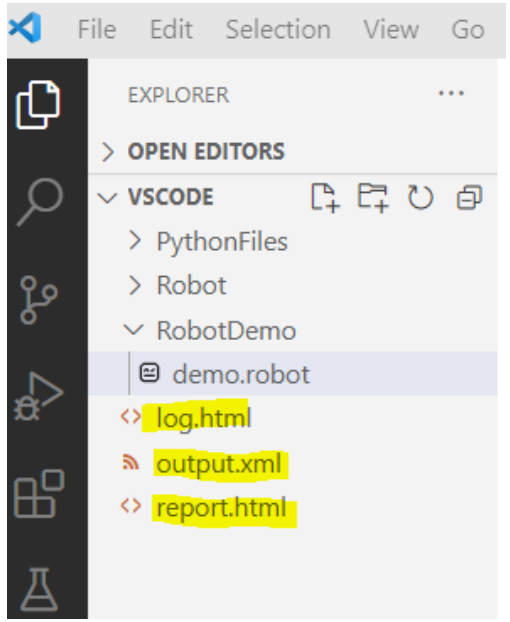
RobotDemo > demo.robot > ...

Run Suite | Debug Suite | Load in Interactive Console

```
1   *** Settings ***
2   Library   String
3
    Load in Interactive Console
4   *** Variables ***
5   ${one}   Donald
6   ${two}   Duck
7
8   *** Test Cases ***
    Run | Debug | Run in Interactive Console
9   Check outcome
10      ${three}=   Set Variable   Donald Duck
11      Should Be Equal    ${one} ${two}    ${three}
```

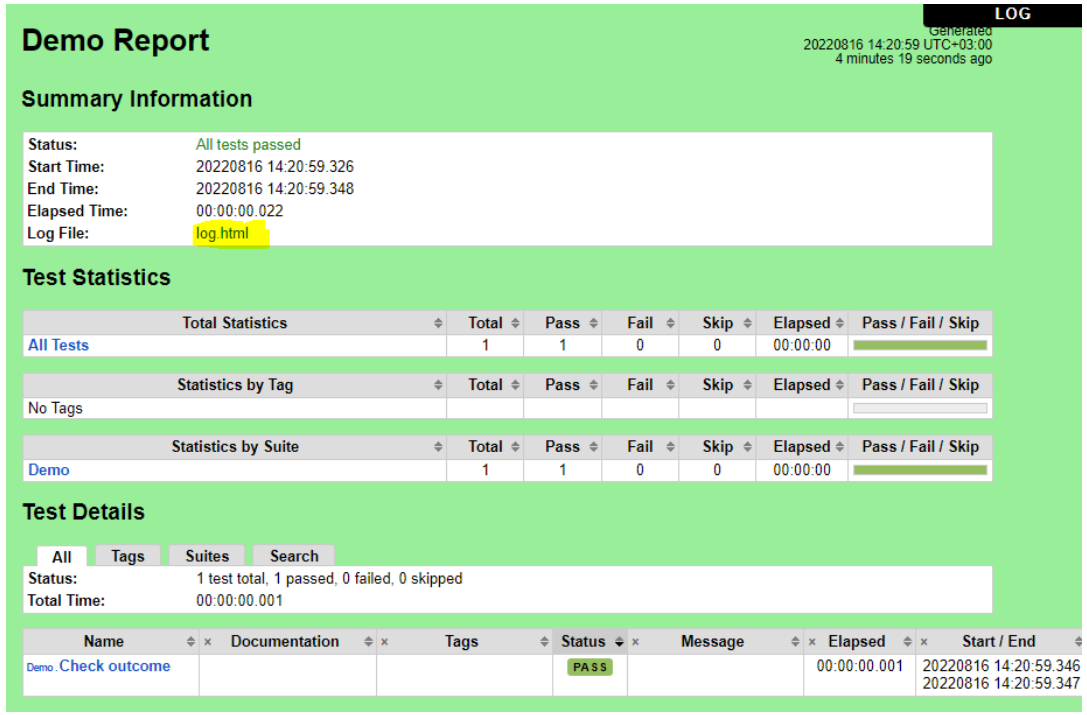
Detailed logs

- Test logs are created by RF



Report

- Open report.html with browser
- Detailed log is in log.html



Demo Report

LOG

Generated
20220816 14:20:59 UTC+03:00
4 minutes 19 seconds ago

Summary Information

Status:	All tests passed
Start Time:	20220816 14:20:59.326
End Time:	20220816 14:20:59.348
Elapsed Time:	00:00:00.022
Log File:	log.html

Test Statistics

Total Statistics	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
All Tests	1	1	0	0	00:00:00	

Statistics by Tag	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
No Tags						

Statistics by Suite	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
Demo	1	1	0	0	00:00:00	

Test Details

All | Tags | Suites | Search

Status:	1 test total, 1 passed, 0 failed, 0 skipped
Total Time:	00:00:00.001

Name	Documentation	Tags	Status	Message	Elapsed	Start / End
Demo.Check outcome			PASS		00:00:00.001	20220816 14:20:59.346 20220816 14:20:59.347

Log

Demo Log

REP

Generated
20220816 14:20:59 UTC+03:00
5 minutes 25 seconds ago

Test Statistics

Total Statistics	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
All Tests	1	1	0	0	00:00:00	

Statistics by Tag	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
No Tags						

Statistics by Suite	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
Demo	1	1	0	0	00:00:00	

Test Execution Log

SUITE **Demo** 00:00:00.022

Full Name: Demo
Source: c:\Esa\temp\vscode\RobotDemo\demo.robot
Start / End / Elapsed: 20220816 14:20:59.326 / 20220816 14:20:59.348 / 00:00:00.022
Status: 1 test total, 1 passed, 0 failed, 0 skipped

TEST **Check outcome** 00:00:00.001

Full Name: Demo.Check outcome
Start / End / Elapsed: 20220816 14:20:59.346 / 20220816 14:20:59.347 / 00:00:00.001
Status: PASS

KEYWORD ${three} = Builtin. **Set Variable** Donald Duck 00:00:00.000

Documentation: Returns the given values which can then be assigned to a variables.
Start / End / Elapsed: 20220816 14:20:59.347 / 20220816 14:20:59.347 / 00:00:00.000

```
14:20:59.347  INFO  ${three} = Donald Duck
```

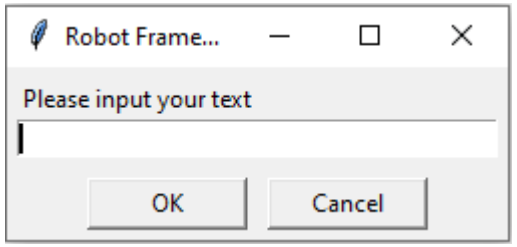
KEYWORD Builtin. **Should Be Equal** ${one} ${two}, ${three} 00:00:00.000

Documentation: Fails if the given objects are unequal.
Start / End / Elapsed: 20220816 14:20:59.347 / 20220816 14:20:59.347 / 00:00:00.000

Get input from user

- Dialogs Library is needed
- Also new Test Case
- Try with correct and incorrect user input

```
Run Suite | Debug Suite | Load in Interactive Console
*** Settings ***
Library   Dialogs

*** Test Cases ***
Run | Debug | Run in Interactive Console
Ask User Input
    ${user}=   Get Value From User    Please input your text
    Should Be Equal    ${user}    Hello World
```



Create List and get value from list

- When user creates list @ character is used
- When user tries to access list afterwards $ is used

```
Run Suite | Debug Suite | Load in Interactive Console
*** Variables ***
@{list}    1    2    3    4

*** Test Cases ***
Run | Debug | Run in Interactive Console
Check value from list
    ${number}=    Set Variable    ${list}[2]
    Should Be Equal    ${number}    3
```

Add new value to the list

- When we try to modify list, we need Collections-library
  - https://robotframework.org/robotframework/latest/libraries/Collections.html

```
Run Suite | Debug Suite | Load in Interactive Console
*** Settings ***
Library   Collections

Load in Interactive Console
*** Variables ***
@{list}   1   2   3   4

*** Test Cases ***
Run | Debug | Run in Interactive Console
Add value to the list
    ${addition}=   Set Variable   333
    Append To List    ${list}    ${addition}
    Should Be Equal    ${list}[4]    333
```

Length of a list

- Run Suite vs. Run single test

```
Run Suite | Debug Suite | Load in Interactive Console
*** Settings ***
Library    Collections

Load in Interactive Console
*** Variables ***
@{list}    1    2    3    4

*** Test Cases ***
Run | Debug | Run in Interactive Console
Add value to the list
    ${addition}=    Set Variable    333
    Append To List    ${list}    ${addition}
    Should Be Equal    ${list}[4]    333

*** Test Cases ***
Run | Debug | Run in Interactive Console
List length
    ${length}=    Get Length    ${list}
    ${expected}=    Convert To Integer    4
    Should Be Equal    ${length}    ${expected}
```

```
Run Suite | Debug Suite | Load in Interactive Console
*** Settings ***
Library    Collections

Load in Interactive Console
*** Variables ***
@{list}    1    2    3    4

*** Test Cases ***
Run | Debug | Run in Interactive Console
Add value to the list
    @{list}=    Copy List    ${list}
    ${addition}=    Set Variable    333
    Append To List    ${list}    ${addition}
    Should Be Equal    ${list}[4]    333

*** Test Cases ***
Run | Debug | Run in Interactive Console
List length
    ${length}=    Get Length    ${list}
    ${expected}=    Convert To Integer    4
    Should Be Equal    ${length}    ${expected}
```

Length of a list / Test Setup

```
Run Suite | Debug Suite | Load in Interactive Console
*** Settings ***
Library   Collections
Test Setup   Create Data For Tests

*** Keywords ***
Load in Interactive Console
Create Data For Tests
    @{list}=    Create List   1   2   3   4
    Set Test Variable    ${list}

*** Test Cases ***
Run | Debug | Run in Interactive Console
Add value to the list
    ${addition}=   Set Variable   333
    Append To List    ${list}    ${addition}
    Should Be Equal    ${list}[4]    333

*** Test Cases ***
Run | Debug | Run in Interactive Console
List length
    ${length}=   Get Length    ${list}
    ${expected}=   Convert To Integer    4
    Should Be Equal    ${length}    ${expected}
```

Ordering the list / Removing from the list

```
Run Suite | Debug Suite | Load in Interactive Console
*** Settings ***
Library    Collections
Test Setup    Create Data For Tests

*** Keywords ***
Load in Interactive Console
Create Data For Tests
    @{names}=    Create List    Donald    Mickey    Goofy    Scrooge    Daisy
    Set Test Variable    ${names}

*** Test Cases ***
Run | Debug | Run in Interactive Console
Put list in alphabetical order
    Sort List    ${names}
    Should Be Equal    ${names}[0]    Daisy

*** Test Cases ***
Run | Debug | Run in Interactive Console
Remove name from list
    Remove From List    ${names}    0
    Should Be Equal    ${names}[0]    Mickey
```

FOR loop

- Let’s loop through values from 1 to 10

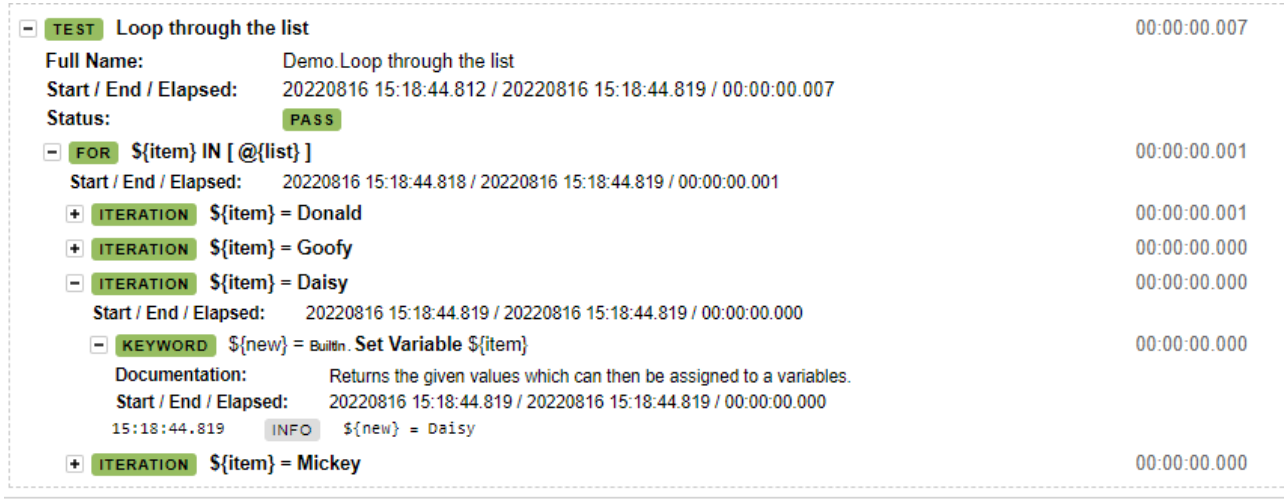
```
Run Suite | Debug Suite
*** Test Cases ***
Run | Debug | Run in Interactive Console
Loop through the numbers
    FOR    ${index}    IN RANGE    1    10
        ${new}=    Set Variable    ${index}
    END
```

```
TEST Loop through the numbers                                   00:00:00.003
  Full Name:              Demo.Loop through the numbers
  Start / End / Elapsed:  20220816 15:16:50.307 / 20220816 15:16:50.310 / 00:00:00.003
  Status:                 PASS
  FOR ${index} IN RANGE [ 1 | 10 ]                              00:00:00.002
    Start / End / Elapsed:  20220816 15:16:50.307 / 20220816 15:16:50.309 / 00:00:00.002
    ITERATION ${index} = 1                                      00:00:00.001
    ITERATION ${index} = 2                                      00:00:00.000
    ITERATION ${index} = 3                                      00:00:00.000
    ITERATION ${index} = 4                                      00:00:00.000
    ITERATION ${index} = 5                                      00:00:00.000
    ITERATION ${index} = 6                                      00:00:00.001
      Start / End / Elapsed:  20220816 15:16:50.308 / 20220816 15:16:50.309 / 00:00:00.001
      KEYWORD ${new} = BuiltIn. Set Variable ${index}           00:00:00.001
        Documentation:          Returns the given values which can then be assigned to a variables.
        Start / End / Elapsed:  20220816 15:16:50.308 / 20220816 15:16:50.309 / 00:00:00.001
        15:16:50.309  INFO  ${new} = 6
    ITERATION ${index} = 7                                      00:00:00.000
    ITERATION ${index} = 8                                      00:00:00.000
    ITERATION ${index} = 9                                      00:00:00.000
```

FOR loop

- Loop list variable

```
Run Suite | Debug Suite | Load in Interactive Console
1  *** Variables ***
2  @{list}    Donald    Goofy    Daisy    Mickey
3
4  *** Test Cases ***
   Run | Debug | Run in Interactive Console
5  Loop through the list
6      FOR    ${item}    IN    @{list}
7          ${new}=    Set Variable    ${item}
8      END
```



Create Folder and File

- OperatingSystem Library is needed
  - https://robotframework.org/robotframework/latest/libraries/OperatingSystem.html

```
*** Settings ***
Library    OperatingSystem

*** Test Cases ***
Run | Debug | Run in Interactive Console
Make new directory
    Create Directory    c:/temp/RobotTesting
    Directory Should Exist    c:/temp/RobotTesting

*** Test Cases ***
Run | Debug | Run in Interactive Console
Create new txt file
    ${path}=    Set Variable    c:/temp/RobotTesting/
    Create File    ${path}example.txt    Hi, we must be having fun?
    File Should Exist    ${path}example.txt
    File Should Not Be Empty    ${path}example.txt
```

Delete File and Folder

```
16  *** Test Cases ***
    Run | Debug | Run in Interactive Console
17  Delete file and folder
18      ${path}=    Set Variable    c:/temp/RobotTesting/
19      Remove file    ${path}example.txt
20      Directory Should Be Empty    ${path}
21      Remove Directory    ${path}
```

Run commands / Ping

```
Run Suite | Debug Suite | Load in Interactive Console
1   *** Settings ***
2   Library    OperatingSystem
3
4   *** Test Cases ***
    Run | Debug | Run in Interactive Console
5   Ping web page and store the ping time
6       ${output}=    Run And Return Rc And Output    ping www.google.com
7       Log    ${output}
```

TEST **Ping web page and store the ping time** 00:00:03.065

Full Name: Demo.Ping web page and store the ping time

Start / End / Elapsed: 20220817 08:45:18.934 / 20220817 08:45:21.999 / 00:00:03.065

Status: PASS

KEYWORD ${output} = OperatingSystem . **Run And Return Rc And Output** ping www.google.com 00:00:03.058

Documentation: Runs the given command in the system and returns the RC and output.

Start / End / Elapsed: 20220817 08:45:18.934 / 20220817 08:45:21.992 / 00:00:03.058

```
08:45:18.940  INFO  Running command 'ping www.google.com 2>&1'.
08:45:21.992  INFO  ${output} = (0, '\nPinging www.google.com [216.58.210.164] with 32 bytes of
                    data:\nReply from 216.58.210.164: bytes=32 time=2ms TTL=59\nReply from
                    216.58.210.164: bytes=32 time=2ms TTL=59\nReply from 216.58.210.1...
```

KEYWORD BuiltIn . **Log** ${output} 00:00:00.000

Documentation: Logs the given message with the given level.

Start / End / Elapsed: 20220817 08:45:21.992 / 20220817 08:45:21.992 / 00:00:00.000

```
08:45:21.992  INFO  (0, '\nPinging www.google.com [216.58.210.164] with 32 bytes of data:\nReply from
                    216.58.210.164: bytes=32 time=2ms TTL=59\nReply from 216.58.210.164: bytes=32
                    time=2ms TTL=59\nReply from 216.58.210.164: bytes=32 time=2ms TTL=59\nReply from
                    216.58.210.164: bytes=32 time=2ms TTL=59\n\nPing statistics for 216.58.210.164:\n
                    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),\nApproximate round trip
                    times in milli-seconds:\n    Minimum = 2ms, Maximum = 2ms, Average = 2ms')
```

Read, transform and create list

- Read text from file (OperatingSystem)
- Remove characters (String)
- Create a list from words (Collections)

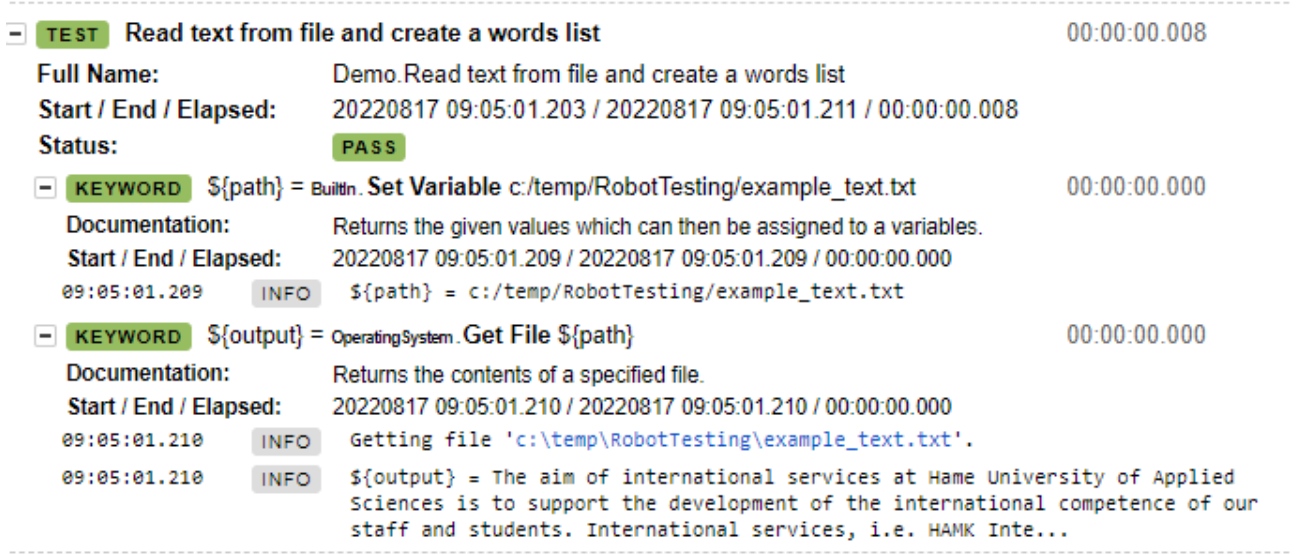
https://robotframework.org/robotframework/latest/libraries/String.html

Text

The aim of international services at Hame University of Applied Sciences is to support the development of the international competence of our staff and students. International services, i.e. HAMK International provides services to promote international student, trainee and staff mobility and also gives information about the many different ways to become international at HAMK. When you want to go abroad for studies or work placement or you are wondering about which alternative is the best for you, the staff of HAMK International will help you to find the best solution. Each degree programme has an international contact person who is responsible for the coordination of incoming students.

Read File

```
Run Suite | Debug Suite | Load in Interactive Console
*** Settings ***
Library    String
Library    OperatingSystem
Library    Collections

*** Test Cases ***
Run | Debug | Run in Interactive Console
Read text from file and create a words list
    ${path}=    Set Variable    c:/temp/RobotTesting/example_text.txt
    ${output}=    Get File    ${path}
```



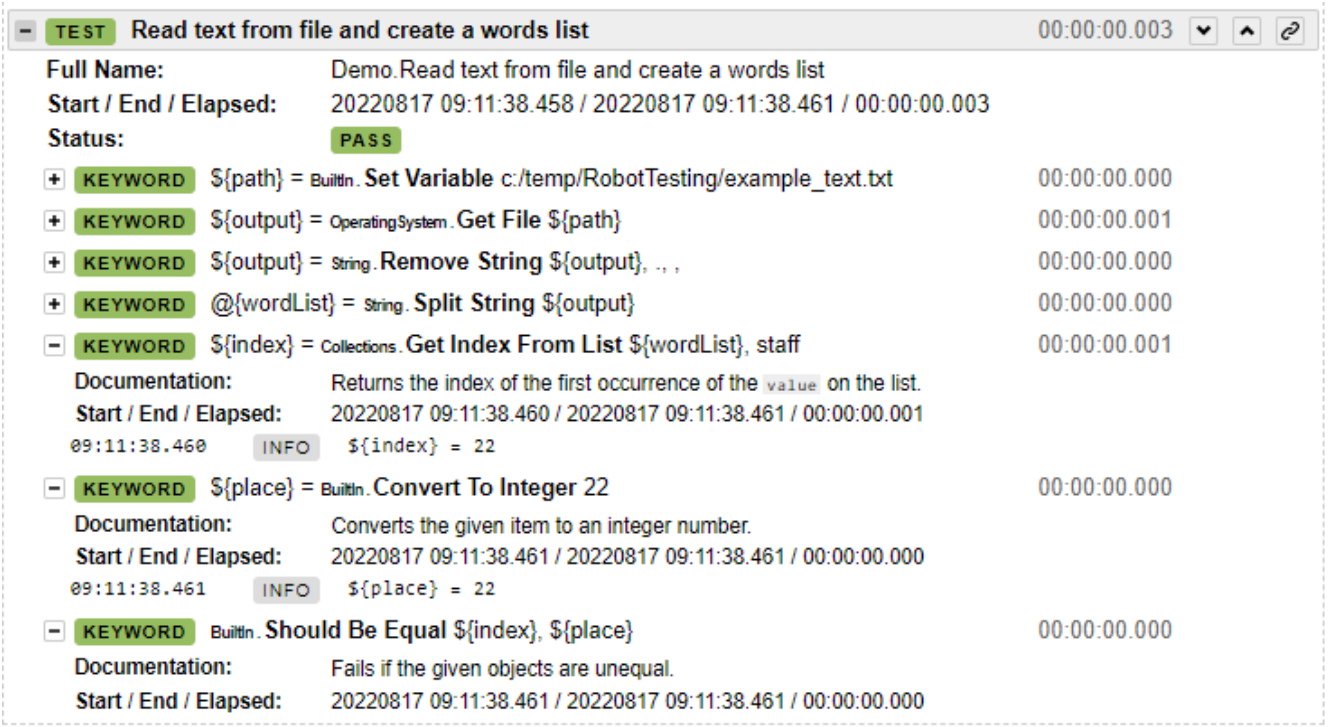
Remove all , and .

```
TEST  Read text from file and create a words list                    00:00:00.002
Full Name:          Demo.Read text from file and create a words list
Start / End / Elapsed:  20220817 09:07:59.313 / 20220817 09:07:59.315 / 00:00:00.002
Status:             PASS
KEYWORD  ${path} = BuiltIn . Set Variable c:/temp/RobotTesting/example_text.txt   00:00:00.000
KEYWORD  ${output} = OperatingSystem . Get File ${path}                           00:00:00.001
Documentation:      Returns the contents of a specified file.
Start / End / Elapsed:  20220817 09:07:59.313 / 20220817 09:07:59.314 / 00:00:00.001
09:07:59.314  INFO  Getting file 'c:\temp\RobotTesting\example_text.txt'.
09:07:59.314  INFO  ${output} = The aim of international services at Hame University of Applied
                    Sciences is to support the development of the international competence of our
                    staff and students. International services, i.e. HAMK Inte...
KEYWORD  ${output} = String . Remove String ${output}, ., ,                      00:00:00.000
Documentation:      Removes all removables from the given string .
Start / End / Elapsed:  20220817 09:07:59.314 / 20220817 09:07:59.314 / 00:00:00.000
09:07:59.314  INFO  ${output} = The aim of international services at Hame University of Applied
                    Sciences is to support the development of the international competence of our
                    staff and students International services ie HAMK Internat...
KEYWORD  @{wordList} = String . Split String ${output}                            00:00:00.001
Documentation:      Splits the string using separator as a delimiter string.
Start / End / Elapsed:  20220817 09:07:59.314 / 20220817 09:07:59.315 / 00:00:00.001
09:07:59.315  INFO  @{wordList} = [ The | aim | of | international | services | at | Hame |
                    University | of | Applied | Sciences | is | to | support | the | development | of
                    | the | international | competence | of | our | staff | and ...
```

```
6   *** Test Cases ***
    Run | Debug | Run in Interactive Console
7   Read text from file and create a words list
8       ${path}=    Set Variable    c:/temp/RobotTesting/example_text.txt
9       ${output}=    Get File    ${path}
10      ${output}=    Remove String    ${output}    .    ,
11      @{wordList}=    Split String    ${output}
```

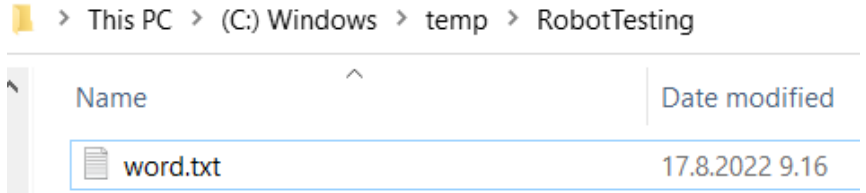
Find from list

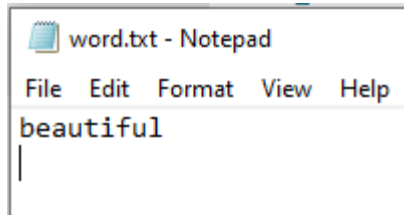
```
6   *** Test Cases ***
    Run | Debug | Run in Interactive Console
7   Read text from file and create a words list
8       ${path}=    Set Variable    c:/temp/RobotTesting/example_text.txt
9       ${output}=    Get File    ${path}
10      ${output}=    Remove String    ${output}    .    ,
11      @{wordList}=    Split String    ${output}
12      ${index}=    Get Index From List    ${wordList}    staff
13      ${place}=    Convert To Integer    22
14      Should Be Equal    ${index}    ${place}
```



Keyword

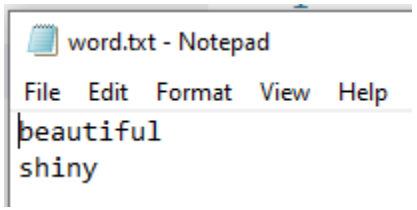
```
Run Suite | Debug Suite | Load in Interactive Console
*** Settings ***
Library    String
Library    OperatingSystem

*** Keywords ***
Load in Interactive Console
Split text
    [Arguments]    ${text}
    @{list}=    Split String    ${text}
    ${word}=    Set Variable    ${list}[1]
    [Return]    ${word}

*** Test Cases ***
Run | Debug | Run in Interactive Console
New test
    ${text}=    Set Variable    My beautiful shoes
    ${word}=    Split text    ${text}
    Should Be Equal    ${word}    beautiful
    Create File    c:/temp/RobotTesting/word.txt    ${word}\n
```





Append file

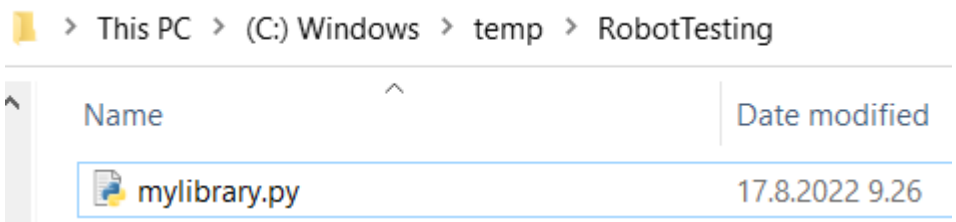
```
19  *** Test Cases ***
    Run | Debug | Run in Interactive Console
20  Another test
21      ${text}=    Set Variable    Your shiny car
22      ${word}=    Split text    ${text}
23      Should Be Equal    ${word}    shiny
24      Append To File    c:/temp/RobotTesting/word.txt    ${word}
25      Run    c:/temp/RobotTesting/word.txt
```



Custom Library with Keywords

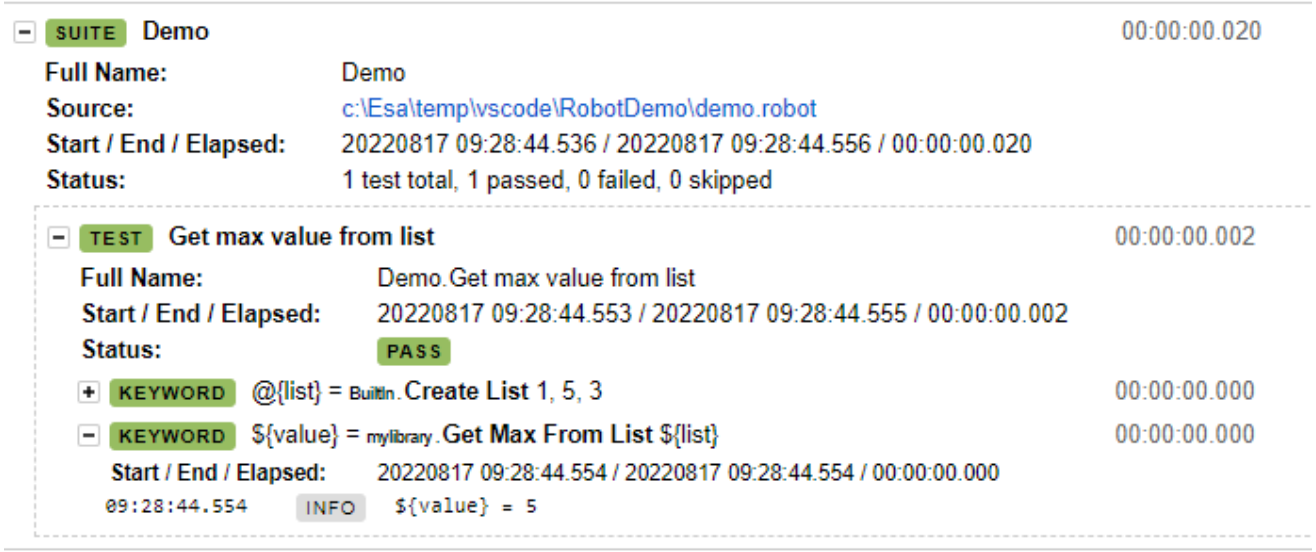
- Lots of times companies create their own keyword to better support their own workflows and testing scopes
- Functionalities can be created using Python coding

Create Python file




```
1  def Get_Max_From_List(list):
2      value = max(list)
3      return value
```

Custom Library




```
Run Suite | Debug Suite | Load in Interactive Console
1   *** Settings ***
2   Library    c:/temp/RobotTesting/mylibrary.py
3
4   *** Test Cases ***
    Run | Debug | Run in Interactive Console
5   Get max value from list
6       @{list}=    Create List    1    5    3
7       ${value}=    Get Max From List    ${list}
```