# A Guide to Empirical Measures

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June 9, 2020

This document is a general guide to the implements of empirical measures.

There are several sections in this guide, with one tool to use in each of them, and usually measures different aspect of a software package. There is no mandatory order to use which tool first.

## 1 git\_stats

### 1.1 Introduction

Name: git\_stats

Source Code: GitHub repo

### 1.2 User Manual

Official Manual: GitHub repo

## 1.3 Demo of Installation and Running the Tool

This is the showcase of how to install and run this tool.

The installation steps on your machine may be different from this section. Please refer to Section 1.2.

Hardware: a virtual machine with 8 cores and 16 GB RAM

OS: Debian GNU/Linux 9.11

1. Install ruby/gem environment

apt-get install ruby ruby-nokogiri ruby-nokogiri-diff ruby-nokogumbo

Check the installation:

gem --version

2. Install the tool

#### sudo gem install git\_stats

### 3. Prepare the target repo

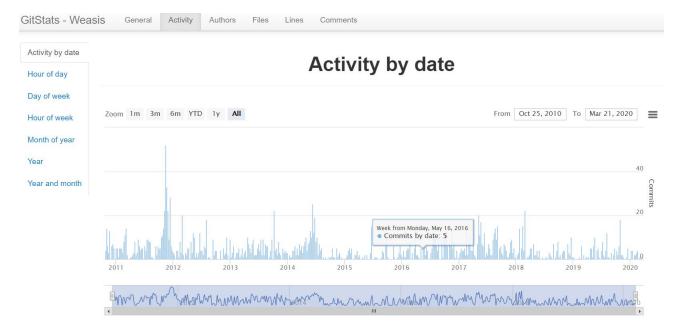
Make sure the target repo (the repo to be analyzed, not the repo of this tool) is on your machine. In this demo, the target repo is downloaded from a GitHub repo:

```
# change [git path] to the url of your target repo
git clone [git path]
# e.g. git clone https://github.com/nroduit/Weasis.git
```

#### 4. Generate analytics

### 5. View the analytics

View the analytic results by open [output path]/index.html with any browser or other software supporting HTML web page format.



#### 6. Download the data

On most of the taps of this web page, the data can be downloaded for more analytics by clicking the menu button beside the data-range section.

### 2 scc

### 2.1 Introduction

Name: scc

Source Code: GitHub repo

### 2.2 User Manual

Official Manual: GitHub repo

### 2.3 Demo of Installation and Running the Tool

This is the showcase of how to install and run this tool.

The installation steps on your machine may be different from this section. Please refer to Section 2.2.

Hardware: a virtual machine with 8 cores and 16 GB RAM

OS: Debian GNU/Linux 9.11

### 1. Install Golang

Follow the official instructions, or the following demo, download the installation package:

```
wget https://dl.google.com/go/go1.14.3.linux-amd64.tar.gz
```

unpack to /usr/local:

```
sudo tar -C /usr/local -xzf go1.14.3.linux-amd64.tar.gz
```

use a text editor to open ~/.profile, e.g.:

```
nano ~/.profile
```

add the following lines to the end of this file:

```
export GOPATH=$HOME/go
export PATH=$PATH:/usr/local/go/bin:$GOPA<u>TH/bin</u>
```

save the file, and load the commands into the current shell instance:

```
source ~/.profile
```

check the installation:

go version

#### 2. Install the tool

### go get -u github.com/boyter/scc/

### 3. Prepare the target repo

Make sure the target repo (the repo to be analyzed, not the repo of this tool) is on your machine. In this demo, the target repo is downloaded from a GitHub repo:

```
# change [project path] to your desired folder
cd [project path]
git clone https://github.com/nroduit/Weasis.git
```

### 4. Generate analytics

```
# make sure [repo path] is the target repo path
cd [repo path]
# use scc to generate analytics
scc
```

### 5. View the analytics

The results will be directly shown.

| Language                              | Files | Lines  | Blanks | Comments | Code   | Complexity |
|---------------------------------------|-------|--------|--------|----------|--------|------------|
| Java                                  | 745   | 129067 | 17549  | 13709    | 97809  | 18207      |
| Properties File                       | 119   | 7632   | 411    | 1116     | 6105   | 0          |
| XML                                   | 113   | 9291   | 163    | 272      | 8856   | 0          |
| Plain Text                            | 44    | 10778  | 50     | 0        | 10728  | 0          |
| Shell                                 | 7     | 609    | 77     | 112      | 420    | 43         |
| Markdown                              | 6     | 2205   | 516    | 0        | 1689   | 0          |
| XML Schema                            | 4     | 529    | 53     | 0        | 476    | 0          |
| License                               | 2     | 288    | 51     | 0        | 237    | 0          |
| gitignore                             | 2     | 45     | 8      | 8        | 29     | 0          |
| YAML                                  | 1     | 19     | 3      | 1        | 15     | 0          |
| Total                                 | 1043  | 160463 | 18881  | 15218    | 126364 | 18250      |
| Estimated Cost to Develop \$4 348 103 |       |        |        |          |        |            |

Estimated Cost to Develop \$4,348,103

Estimated Schedule Effort 26.819132 months

Estimated People Required 19.204800