A Guide to Empirical Measures

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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:

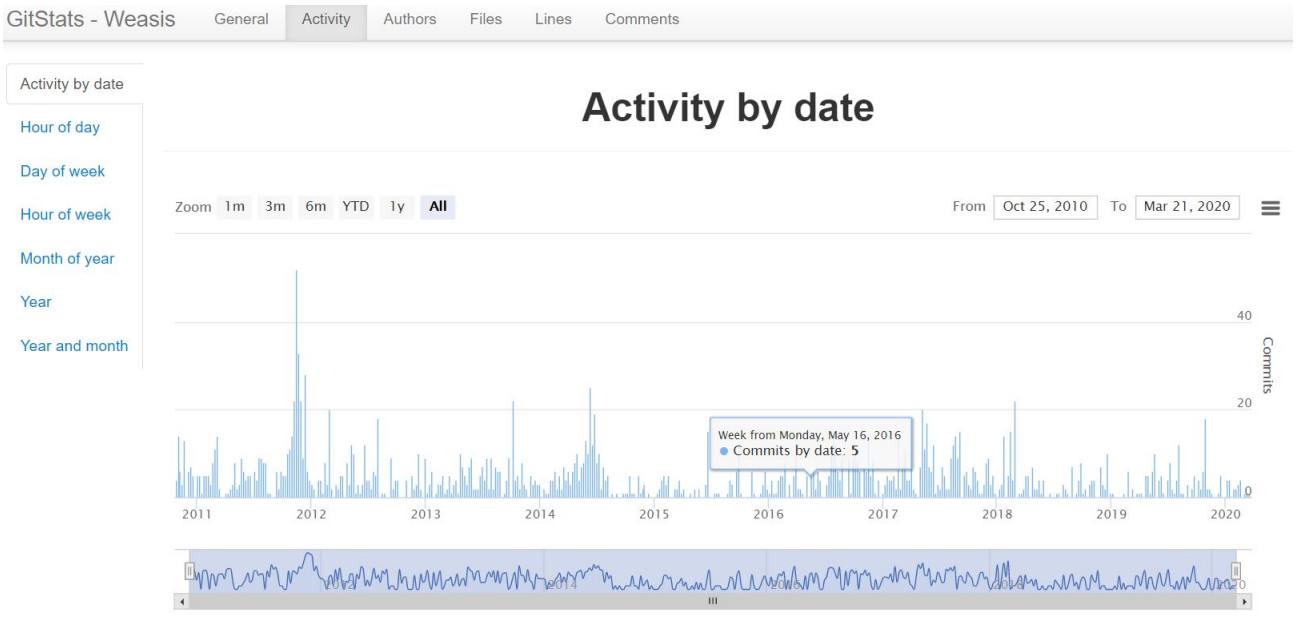
```
# change [project path] to your desired folder
cd [project path]
git clone https://github.com/nroduit/Weasis.git
```

4. Generate analytics

```
# make sure [repo path] is the target repo path
# the [output path] can be anywhere you desire
git_stats generate -p [repo path] -o [output path]
# e.g. git_stats generate -p /home/user/git-stats/Weasis -o
/home/user/git-stats/Weasis-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:$GOPATH/bin
   ```

   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 Schedule Effort 26.819132 months
Estimated People Required 19.204800
-------------------------------------------------------------------------------
```