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1 Executable version information

The executable setup of the SST Tool is a standalone application that allows computing the SST ratio using an executable Windows program. It contains the following programs:

1. The R package sstModel,
2. The R programs and packages necessary for the R package sstModel,
3. A portable Chromium webbrowser,
4. A program for the automatic installation on a Windows computer.

Note that the following system requirements are identical to those provided in the fieldtest.

1.1 System requirements of the executable version

1.1.1 System requirements

An Intel-compatible machine, with at least 4GB RAM.

1.1.2 Operating system

The executable setup is distributed in two different versions:

<table>
<thead>
<tr>
<th>File</th>
<th>Windows Versions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSTTool_setup_x86.exe</td>
<td>32 bit</td>
</tr>
<tr>
<td>SSTTool_setup_x64.exe</td>
<td>64 bit</td>
</tr>
</tbody>
</table>

Both versions do not require any external libraries or programs to run properly, with the exception of the Windows system libraries. They are compatible with the following Windows versions:

<table>
<thead>
<tr>
<th>Windows Versions</th>
<th>Versions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows 7</td>
<td>32 &amp; 64 bit</td>
</tr>
<tr>
<td>Windows 8.1</td>
<td>32 &amp; 64 bit</td>
</tr>
<tr>
<td>Windows 10</td>
<td>32 &amp; 64 bit</td>
</tr>
</tbody>
</table>

The executable version may also run on other versions of Windows. However, it has been tested only for the listed versions.

1.1.3 Further information

Please note that the SST Tool has to be installed in a directory for which the end user has write permissions.
1.2 Installation of the executable version

Step 1

Download the executable version from the SST website. For system requirements cf. chapter 1.1

Step 2

Double-click on the downloaded file.

Step 3

Read the legal notices and then click Next.

Step 4

Wait for the installation to be completed. This will take approximatively 5 minutes.
Step 5

Choose whether you want to launch the SST Tool or not, then click on Finish.

1.3 Use of the executable version

The following picture shows the exchange between excel template, dashboard and R-package.
Step 1

After the installation, you will find a shortcut of the SST Tool on the desktop. Double-click on this shortcut to start the program.

Step 2

The SST Tool starts and a browser opens with the dashboard. Click on Legal Notices for the legal notices related to the use and transfer of the package.
Step 3

Upload the *SST-Template.xlsx* with the company specific data.

Step 4

Enter a number of simulations between 1000 and 1 million. The seed can be entered manually in the dashboard. Click on the box *Run simulations* to start the SST calculations.

Step 5

The *SST-Template.xlsx* is parsed. Specific error messages are displayed in case any inputs are incomplete or incorrect.
Step 6

The simulations for the calculation of the SST ratio are generated. This step can take a few minutes.

Step 7

Once the simulations are generated and the results for the *Fundamental Data Sheet* are calculated, a graphic is displayed on the screen showing the most important results and distribution functions.
Step 8

Select the risk factors by ticking the boxes and click on the box *Simulation results* to download the results for the *Fundamental Data Sheet* and the simulations of the selected risk factors.

Step 9

An excel file *Fundamental_Data.xlsx* containing the results is downloaded...
2 R package *sstModel*

The R package *sstModel* for the calculation of the SST Ratio consists of the following programs:

1. the standalone R package *sstModel* itself
2. a GUI *Dashboard* started by a web browser.

The R package *sstModel* requires the programs R, RTools and Rstudio as well as other R packages.

Note that the following system requirements are identical to those provided in the fieldtest.

2.1 System requirements of the R package

2.1.1 System requirements

An Intel-compatible machine, with at least 4GB RAM.

2.1.2 Operating system

The *sstModel* R package is compatible with the following Windows versions:

<table>
<thead>
<tr>
<th>Windows</th>
<th>Versions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows 7</td>
<td>32 &amp; 64 bit</td>
</tr>
<tr>
<td>Windows 8.1</td>
<td>32 &amp; 64 bit</td>
</tr>
<tr>
<td>Windows 10</td>
<td>32 &amp; 64 bit</td>
</tr>
</tbody>
</table>

The *sstModel* R-package can also run on other Unix based operating systems supported by R. However, it has been designed only for the listed Windows versions.

2.1.3 Required software programs

The following software programs need to be pre-installed on the user's machine.

<table>
<thead>
<tr>
<th>Software name</th>
<th>Minimum version</th>
<th>Actual release version</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>3.3.0</td>
<td>3.5.1</td>
</tr>
<tr>
<td>Rtools</td>
<td>3.4</td>
<td>3.5.04.</td>
</tr>
<tr>
<td>RStudio</td>
<td>1.0.136</td>
<td>1.1.456</td>
</tr>
</tbody>
</table>

Remark: RStudio is necessary for launching the *sstModel*’s Dashboard GUI.
2.1.4 Required R packages

The *sstModel* R package requires the following R packages to be installed in the user's R package library. Package names in italic are pre-installed within R.

<table>
<thead>
<tr>
<th>Package name</th>
<th>Minimum version</th>
<th>Actual CRAN release version</th>
</tr>
</thead>
<tbody>
<tr>
<td>data.table</td>
<td>1.10.4-3</td>
<td>1.11.8</td>
</tr>
<tr>
<td>readxl</td>
<td>1.0.0</td>
<td>1.1.0</td>
</tr>
<tr>
<td>openxlsx</td>
<td>4.0.17</td>
<td>4.1.0</td>
</tr>
<tr>
<td>MASS</td>
<td>None</td>
<td>7.3-51</td>
</tr>
<tr>
<td>shiny</td>
<td>1.0.5</td>
<td>1.1.0</td>
</tr>
<tr>
<td>shinydashboard</td>
<td>0.6.1</td>
<td>0.7.1</td>
</tr>
<tr>
<td>cellranger</td>
<td>None</td>
<td>1.1.0</td>
</tr>
<tr>
<td>Rcpp</td>
<td>0.11.6</td>
<td>0.12.19</td>
</tr>
<tr>
<td>tibble</td>
<td>1.1</td>
<td>1.4.2</td>
</tr>
<tr>
<td>httpuv</td>
<td>1.3.5</td>
<td>1.4.5</td>
</tr>
<tr>
<td>mime</td>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td>jsonlite</td>
<td>0.9.16</td>
<td>1.5</td>
</tr>
<tr>
<td>xtable</td>
<td>None</td>
<td>1.8-3</td>
</tr>
<tr>
<td>digest</td>
<td>None</td>
<td>0.6.18</td>
</tr>
<tr>
<td>htmltools</td>
<td>0.3.5</td>
<td>0.3.6</td>
</tr>
<tr>
<td>R6</td>
<td>2.0</td>
<td>2.3.0</td>
</tr>
<tr>
<td>sourcetools</td>
<td>None</td>
<td>0.1.7</td>
</tr>
<tr>
<td>rematch</td>
<td>None</td>
<td>1.0.1</td>
</tr>
<tr>
<td>cli</td>
<td>None</td>
<td>1.0.1</td>
</tr>
<tr>
<td>crayon</td>
<td>None</td>
<td>1.3.4</td>
</tr>
<tr>
<td>pillar</td>
<td>None</td>
<td>1.3.0</td>
</tr>
<tr>
<td>rlang</td>
<td>None</td>
<td>0.3.0.1</td>
</tr>
<tr>
<td>assertthat</td>
<td>None</td>
<td>0.2.0</td>
</tr>
<tr>
<td>utf8</td>
<td>1.1.3</td>
<td>1.1.4</td>
</tr>
<tr>
<td>stats</td>
<td>-</td>
<td>-</td>
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<tr>
<td>utils</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>tools</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>methods</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>grDevices</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>graphics</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
2.2 Installation of the R package

Step 1

Download the R package `sstModel_2.0.1.tar.gz` from the SST web page. For system requirements cf. chapter 2.1.

Step 2

Start RStudio. Select the tab Packages on the right and click on Install. A dialog box opens.

Step 3

Click on Browse, search for the R package `sstModel_2.0.1.tar.gz` and click Install in the dialog box.
Step 4

After a moment, a blue command, a red feedback and, in black, all functions from the *sstModel* are displayed in the console.

![Console output](image)

Step 5

The installation is completed successfully, when everything is displayed in black. Otherwise, for system requirements please refer to chapter 2.1.

![Package installation](image)

2.3 Use of the R package

The following picture shows the exchange between excel template, dashboard and R package.
Step 1

Start Rstudio. Enter the command `library(sstModel)` into the console down left. Copyright notes and some other messages are displayed. Enter the command `launchDashboard()`.

```
> library(sstModel)
sstModel 2.0.0

Copyright (c) 2018 Swiss Financial Market Supervisory Authority FINMA

Swiss Financial Market Supervisory Authority FINMA
Laupenstrasse 27
CH-3003 Bern

info@finma.ch

This program comes with ABSOLUTELY NO WARRANTY.
This is free software, and you are welcome to redistribute it
under certain conditions.

Type launchDashboard() and go to the 'Legal Notices' Tab for more details about the license.
Type sstModel_news() to see new features/changes/fixes.
Type sstModel_check() to scan your package library for potential issues.
```

Step 2

The SST Tool starts and a browser opens with the dashboard. Click on Legal Notices for the legal notices related to the use and transfer of the package.
Step 3

Upload the *SST-Template.xlsx* with the company specific data.

Step 4

Enter a number of simulations between 1000 and 1 million. The seed can be entered manually in the dashboard. Click on the box *Run simulations* to start the SST calculations.
Step 5

The SST-Template.xlsx is parsed. Specific error messages are displayed in case any inputs are incomplete or incorrect.

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The simulations for the calculation of the SST ratio are generated. This step can take a few minutes.

Step 7

Once the simulations are generated and the results for the Fundamental Data Sheet are calculated, a graphic is displayed on the screen showing the most important results and distribution functions.

Step 8
Select the risk factors by ticking the boxes and click on the box Simulation results to download the results for the Fundamental Data Sheet and the simulations of the selected risk factors.

Step 9

An excel file Fundamental_Data.xlsx containing the results is downloaded.

It is recommended to choose a free path (not overwriting an already existing file) when the file Fundamental_Data.xlsx is downloaded.