User Manual

FS Calculator 1.0

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1. Introduction

FS calculator is developed for the academic environment for the calculation of factor of safety. The software provides an easy interface to make the calculation quicker and more reliable. It can be installed (currently) on the windows system.

Following are the system requirements for FS Calculator to work efficiently:

Disk Space: 23 MB

RAM: 23 MB

Display: 1280x768 or more

OS: Windows 10, Windows 8, Windows 7, Windows XP.

The application has been tested on Windows 10 rigorously and every attempt is made to make it reliable, however, unintentional errors or run-time errors may occur. For such errors, authors and developers claim no warranty whatsoever. Please see license section for more information.

But if the user encounters an error, he/she can report the error to the developers. They will readily help to sort out the problem. Furthermore, any feedback regarding the interface of the application or the functionality is warmly welcome.

2. Installation

1. Double-click the setup file.

Fig. 1: Setup for FS Calculator installer.

2. Windows may ask for permission to install it. Click yes if it asks.

After this, you should see this dialog box, as shown in Fig. 2.

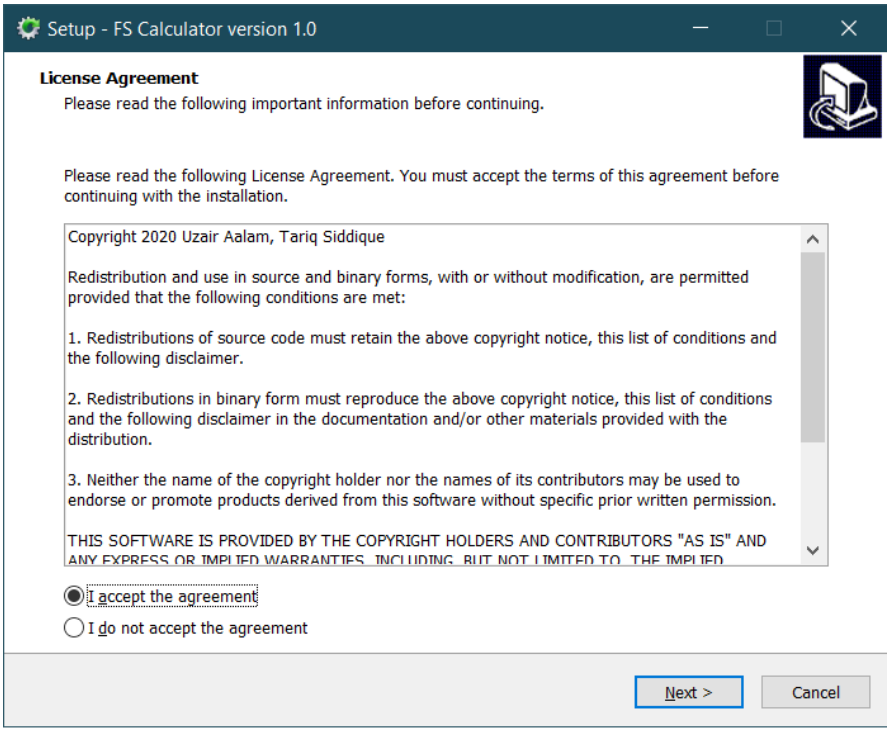

Fig. 2: License agreement dialogue.

3. Choose “I accept the agreement” and click Next.

Then, the next dialog box will ask about creating a shortcut of *FS Calculator* on the desktop. User can click the check box if he/she wishes, see Fig. 3.

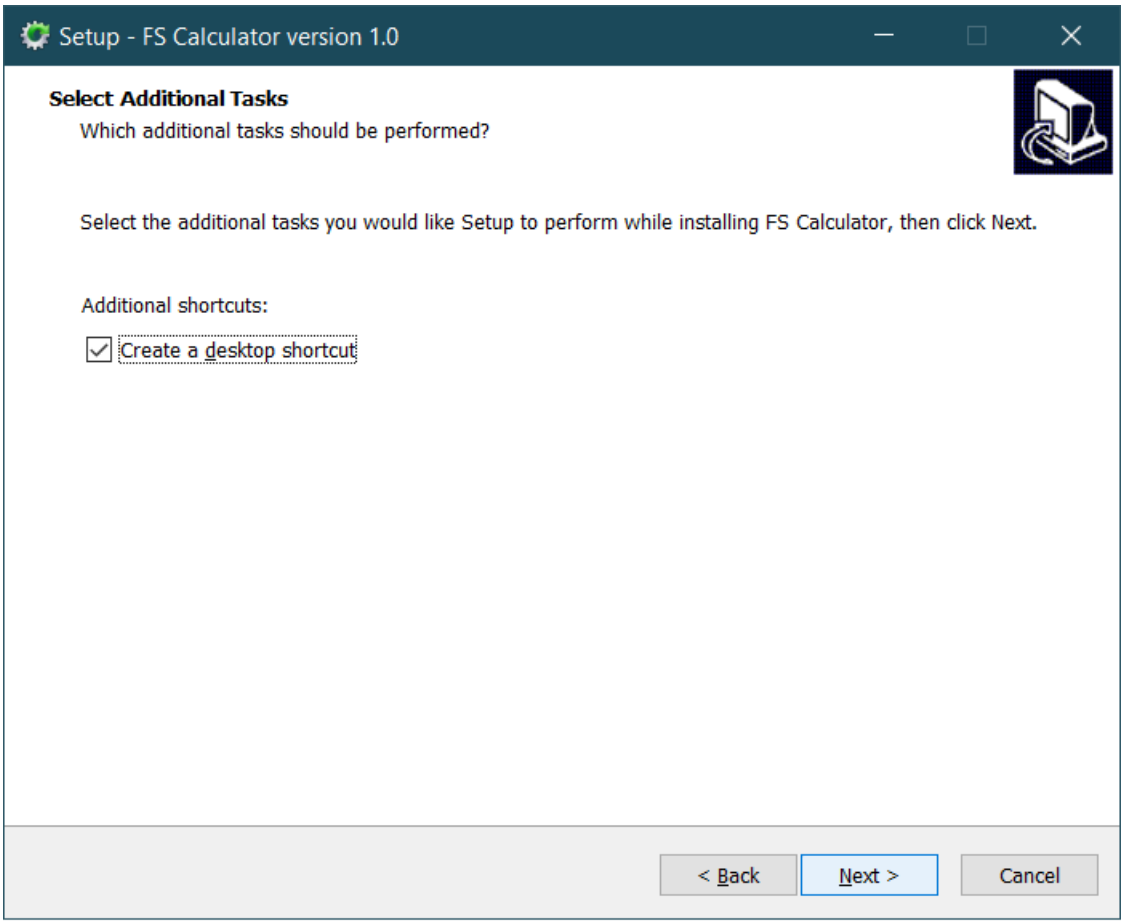

Fig. 3: Desktop shortcut creation.

4. Click on the Next button once more.

A dialog box appears, as shown in Fig. 4, to confirm the actions to be performed.

5. Click Install to start the installation process.

The Installation progress will be displayed on the screen, through a progress bar, as shown in Fig. 5.

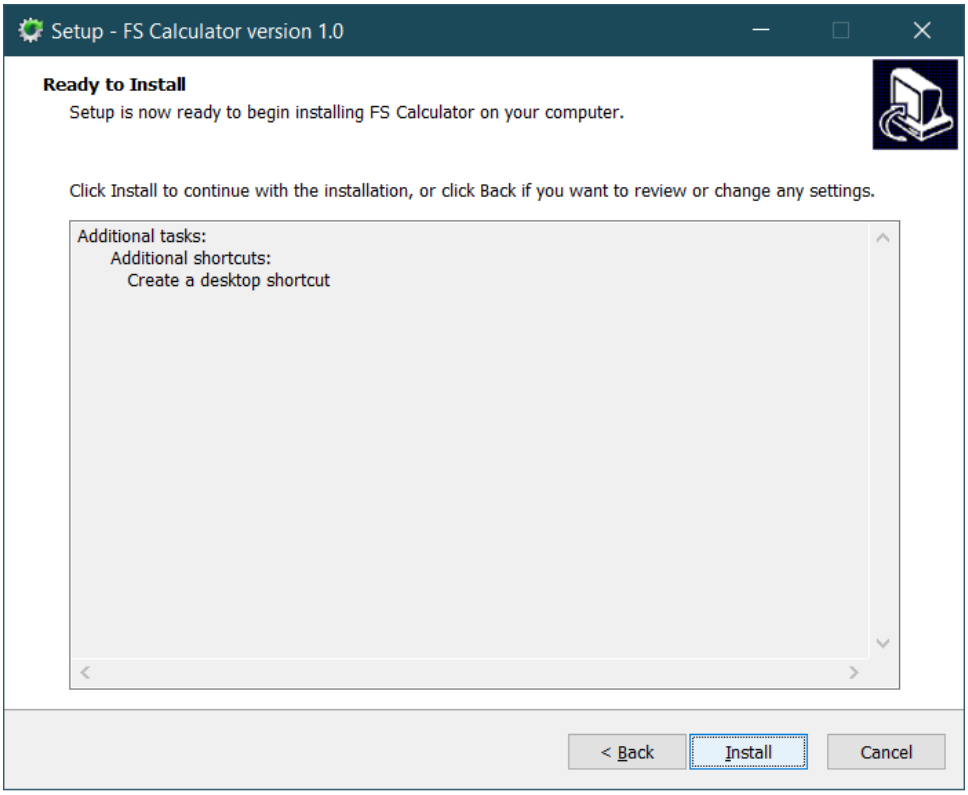

Fig. 4: Confirmation of installation options.

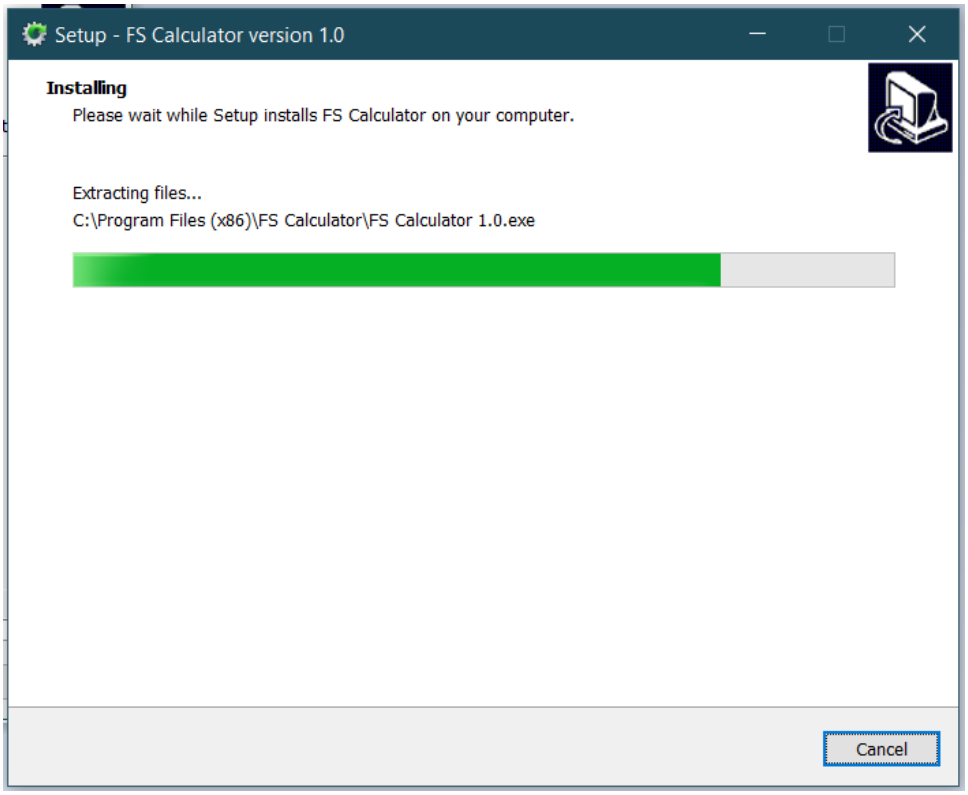

Fig. 5: Progress of installation process.

When the installation is finished, the following dialog box confirms the installation and ask whether the user wants to start the *FS Calculator* right now, see Fig. 6.
Check or uncheck the “Launch FS Calculator” button as per the requirement.

6. Click Finish to close this dialog box.

The *FS Calculator* is now installed on the system.

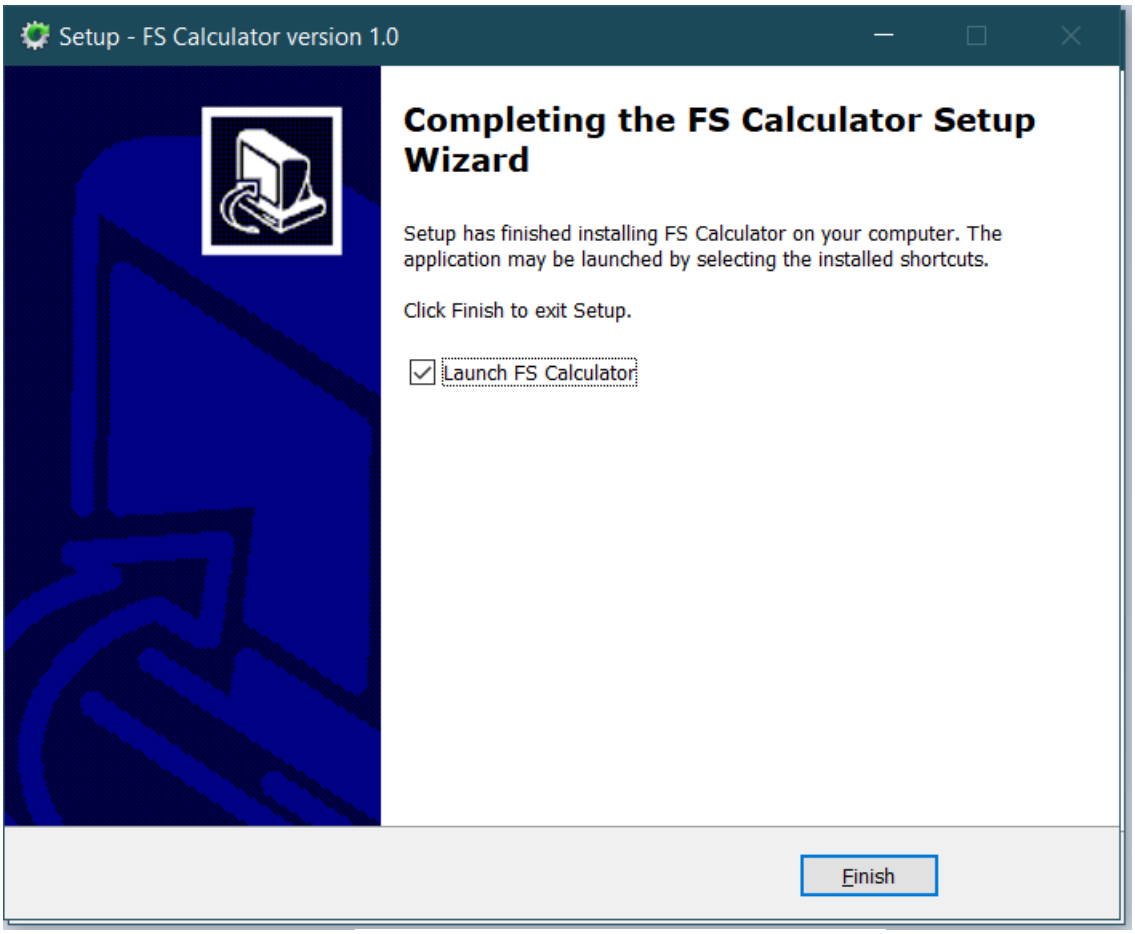

Fig. 6: Confirmation of installation.

3. Factor of Safety Calculation

1. Launch the *FS Calculator.*

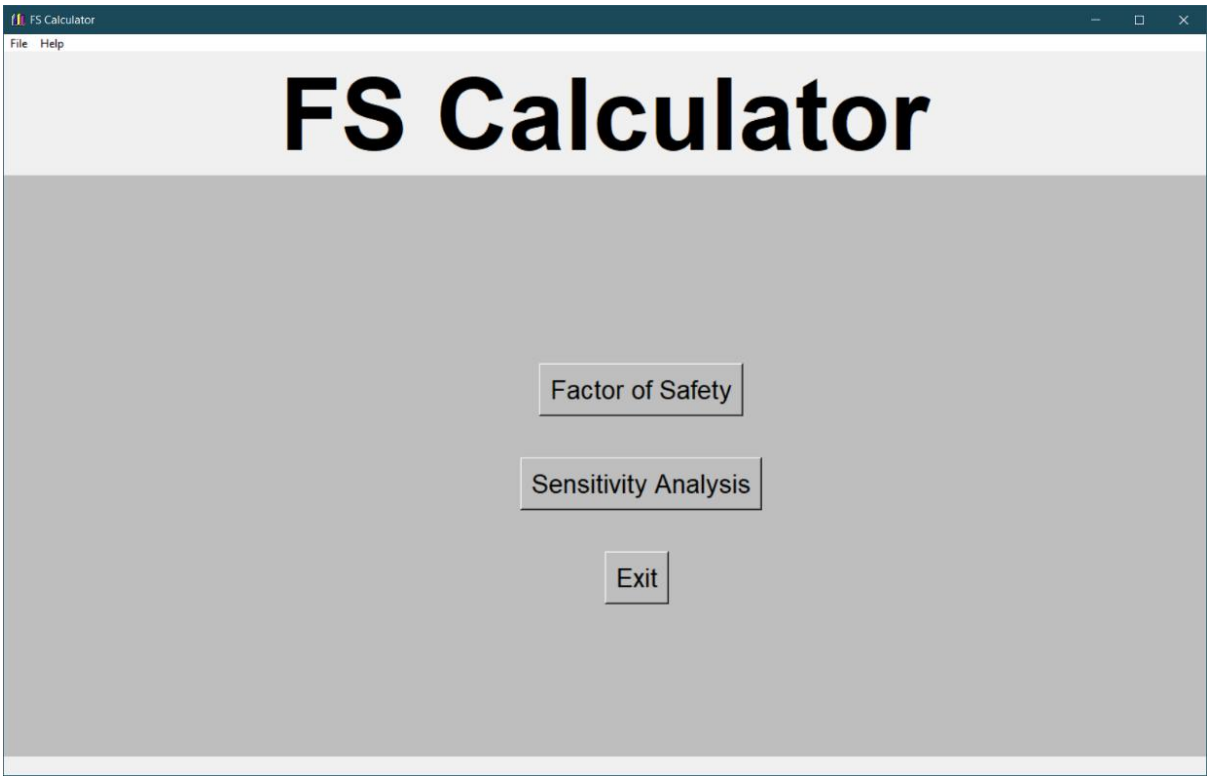

Fig. 7: The main window of FS Calculator.

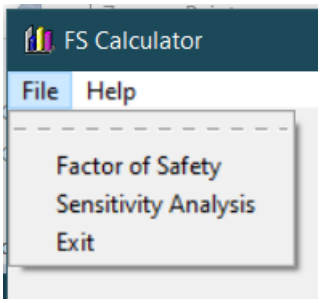

Fig. 8: The *file* menu.

2. In the main window click “Factor of Safety” button.

Alternatively, go to the File menu and click Factor of Safety command.

It will open another window, as shown in Fig. 9, where various parameters are entered in their respective text boxes. Following window will appear. Here, all the parameters are filled.

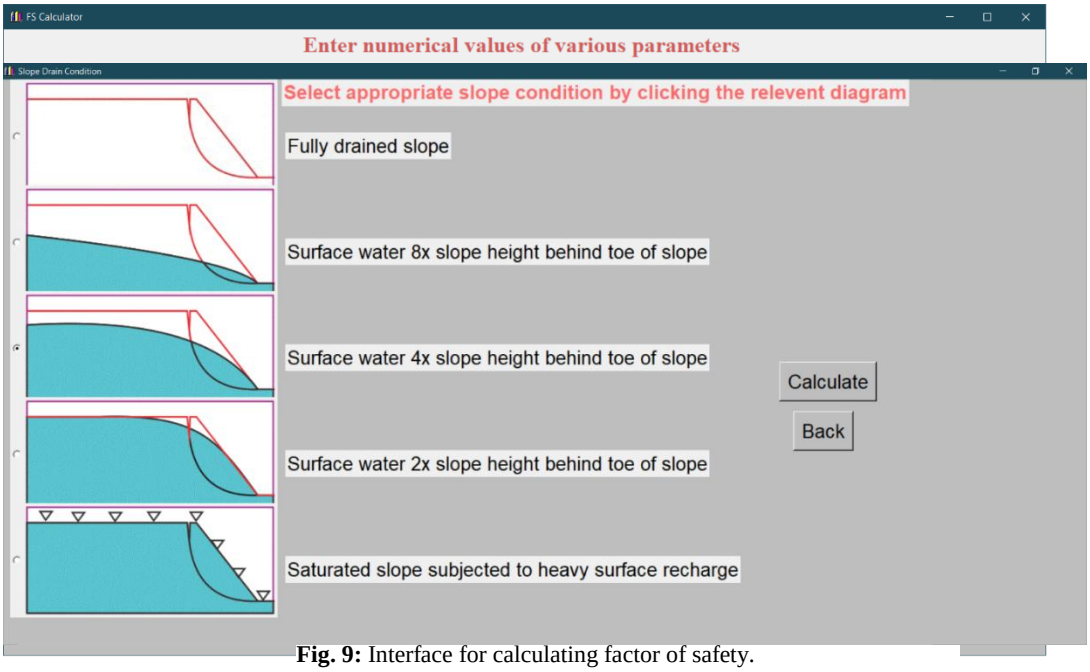

Fig. 9: Interface for calculating factor of safety.

Fig. 10: Slope condition selection window.

3. Then, clicking the Next button, opens the window showing the slope conditions, Fig. 10.

4. Choosing the appropriate slope condition by clicking the image on the left panel and clicking the Calculate button shows the results. The *result* window is shown in Fig. 11.

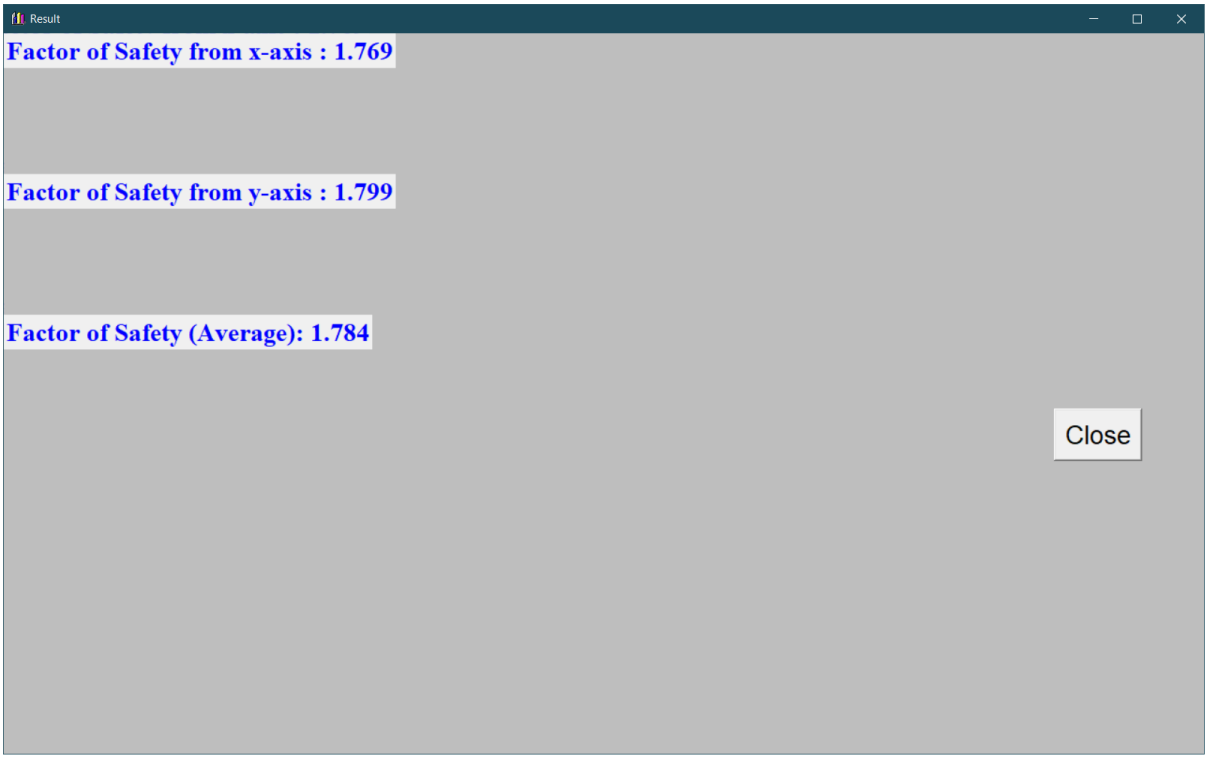

Fig. 11: The *Result* window.

The result consists of factor of safety as calculated from x and y axes of circular failure charts and their average.

Tip: If you close this window and choose a different slope condition and click again on Calculate button you will get different result without entering all the values again.

4. Sensitivity Analysis

1. In the main window click “Sensitivity Analysis” button.

Alternatively, go to the File menu and click Sensitivity Analysis command.

It will open another window, shown in Fig. 12, where various parameters are entered in their respective text boxes.

The parameters whose variation is to be studied are selected by clicking the toggle buttons on the very left of the window and the range of them is filled.

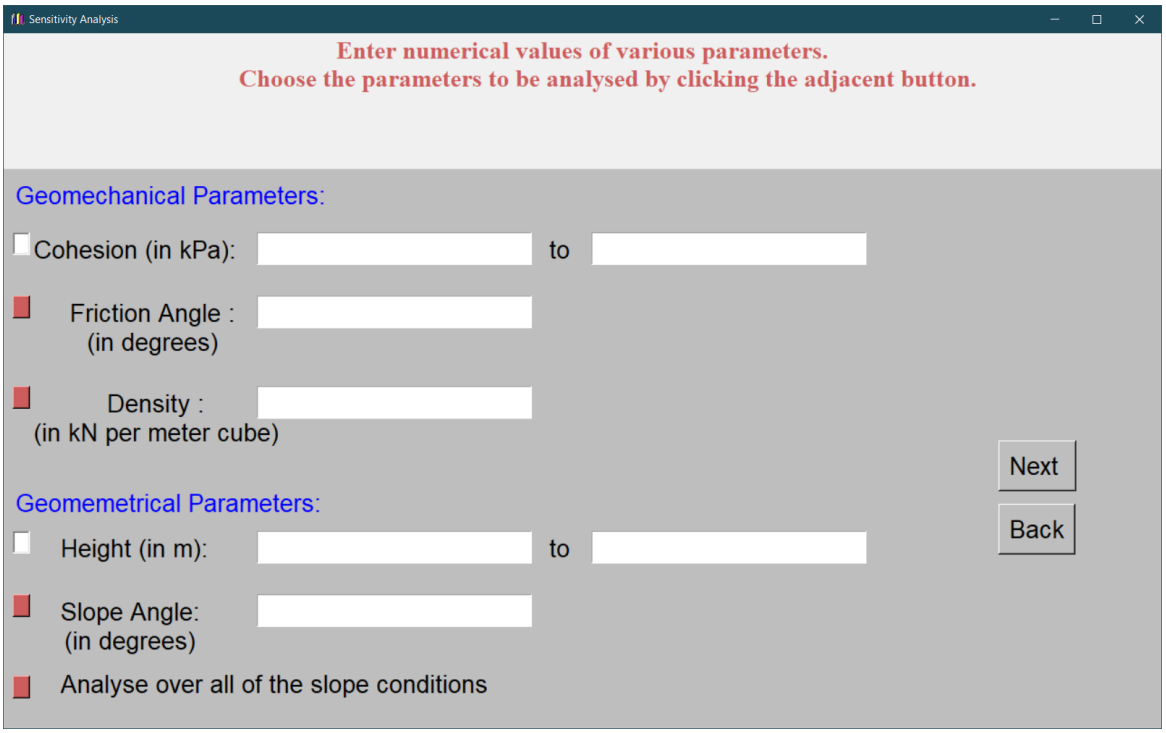

Fig. 12: The sensitivity analysis window.

2. Then, the Next button is clicked.

In the next window, again the slope conditions will be presented to choose from.

If “Analyse over all of the slope conditions” is chosen then Run Analysis button will be shown instead of Next button and the slope condition need not be selected.

3. The appropriate slope condition is chosen and Run Analysis button is clicked, see Fig. 13.

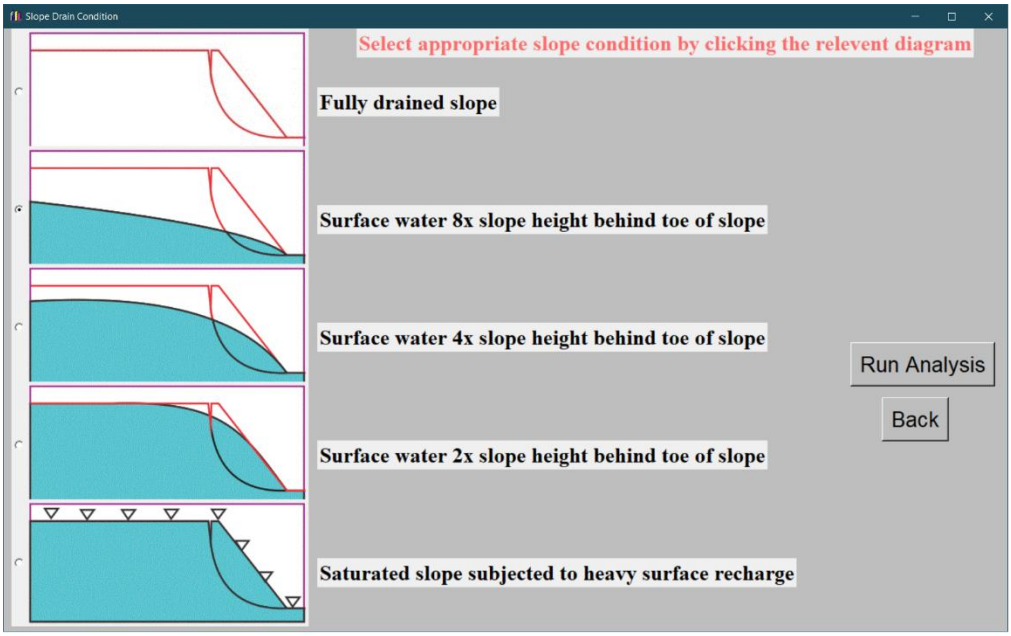

Fig. 13: The sensitivity analysis window.

4. When the analysis is over, a file “ Save As” dialog box appears, Fig. 14.

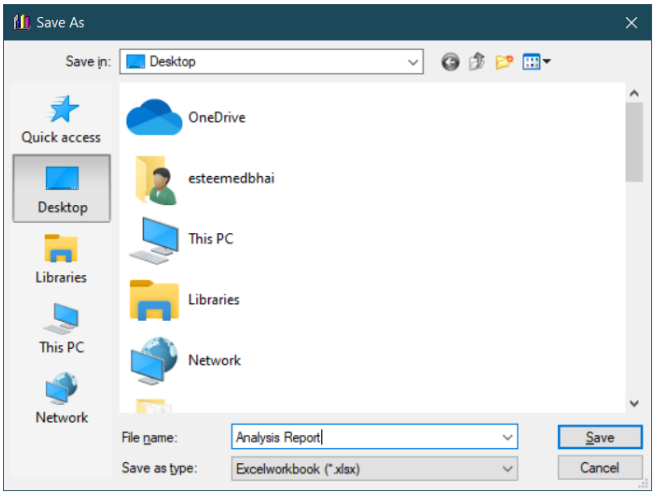

Fig. 14: Saving the result file for sensitivity analysis.

5. Browse to the desired folder and enter the file name.

The file will be saved as MS Excel worksheet with extension .xlsx.

6. The excel file can be opened to see the graph and data.

Fig. 15: The file is saved as an excel spreadsheet.

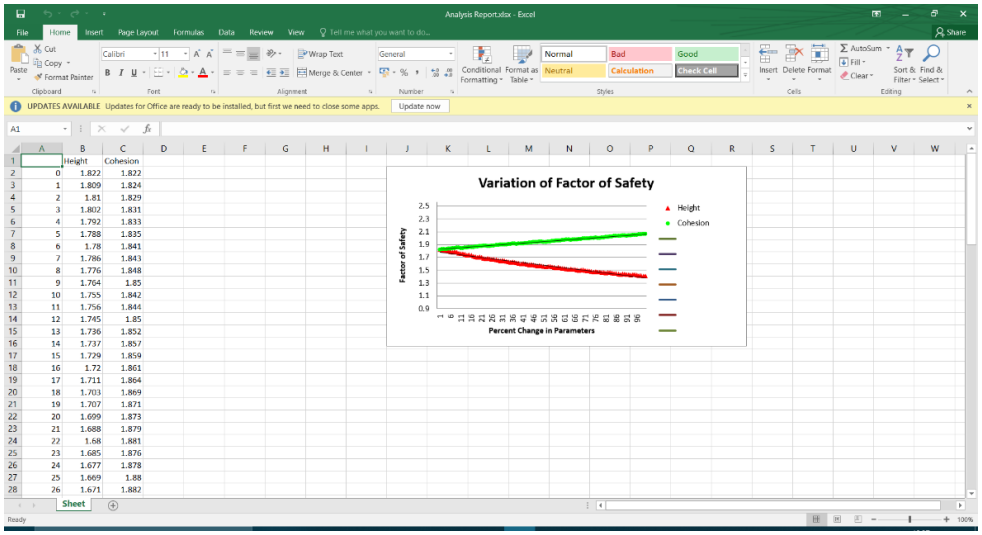

Fig. 16: The spreadsheet data file.

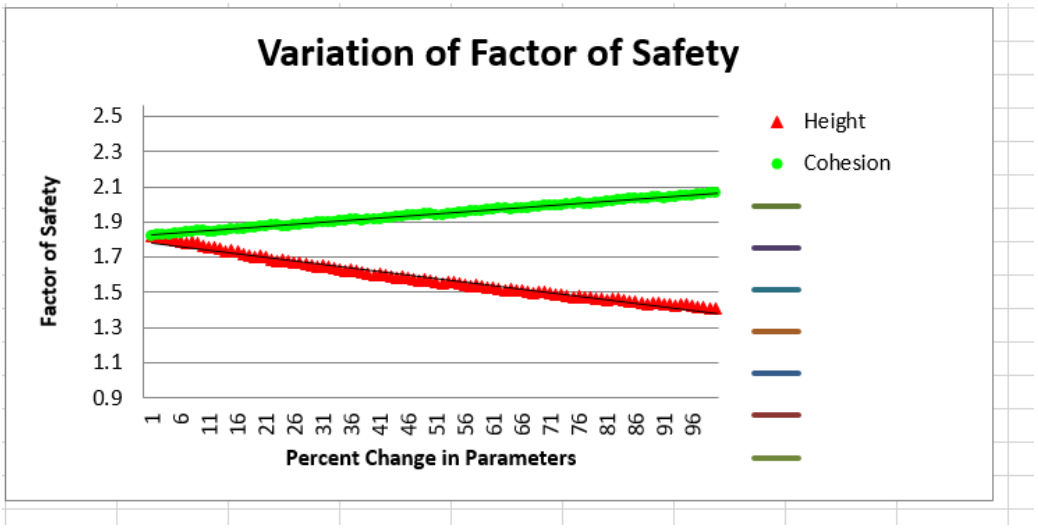

Fig. 17: The sensitivity analysis graph.

This graph can be modified with the usual excel tools to suit the requirement.

5. Licence Agreement