Report

EnergyPlus Batch Simulations Program

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1 Introduction

The program described in this report is used for running batch simulations using EnergyPlus input and weather data files. It is a cross-platform application based on java programming language which enables users to run batch simulations in a few simple steps using GUI. User has to enter locations of input data files directory, weather data files directory in the program. Also, depending on which version of EnergyPlus user is running, a working directory needs to be entered. The working directory contains all the required *.dll, *.exe etc. files to run EnergyPlus simulation program. The working directory must have a folder named "PostProcess" which contains ReadVarsESO to generate eplusout.csv from eplusout.eso files. Sections below have more information about the program.

2 Program execution

1. Program was launched by double clicking *E+BatchSimulations.jar*. Before running the program on Ubuntu, E+BatchSimulations.jar file should be made executable by right clicking the file and checking "Allow executing file as program" under Permissions tab as shown in Figure A9.

2. Once all the directory information are entered by the user, clicking "Start" button will start program execution.

3. EnergyPlus simulations are run until all the *.idf files in the input files directory and all the *.epw files in the weather data directory are exhausted. (Thus *Total number of simulations = number of input data files * number of weather data files*).

4. As the simulation progresses, folders named after weather file locations are created by the program in output directory specified by the user. All the simulation outputs for each location are stored respectively in those folders.

5. When all the simulations are complete, a completion message dialog box appears which displays total number of simulations completed and total time taken by the program.

Graphical illustration of the above steps is presented in the Appendix A below.

3 Testing

Program was tested on machines with following operating systems

- Windows 7, 32 bit
- Windows 7, 64 bit
- Ubuntu 14.04 LTS, 64 bit

Though the program was tested with EnergyPlus versions 7.2, 8.0, 8.1, 8.2, 8.3, & 8.4, it should be able to run on EnergyPlus versions other than listed above.

Note: Even though the program allows the user to run different EnergyPlus versions, it is always recommended to switch to the latest EnergyPlus version when possible. This way, any bugs which were present in the previous EnergyPlus versions are avoided as they get fixed in subsequent releases. Also switching to latest version enables the user to have better and faster technical support. Appendix B below describes how to transition large number of files using *"IDFVersionUpdater"*.

4 Requirements

"EnergyPlus Batch Simulations" program requires Java Run Time Environment 1.8 to be installed on the machine. Table 1 below has more details.

Table 1: EnergyPlus Batch Simulation Program Requirements

Product/File Description	**File Size**	**Download**
Linux x64	68.38 MB	jre-8u65-linux-x64.tar.gz
Windows x86 Offline	47.81 MB	jre-8u65-windows-i586.exe
Windows x64	54.29 MB	jre-8u65-windows-x64.exe

Note: If there are any issues regarding running the program, please contact the author for assistance.

Appendix A Graphical illustration of the program

The program is launched by double clicking *"E+BatchSimulations.jar"* file.

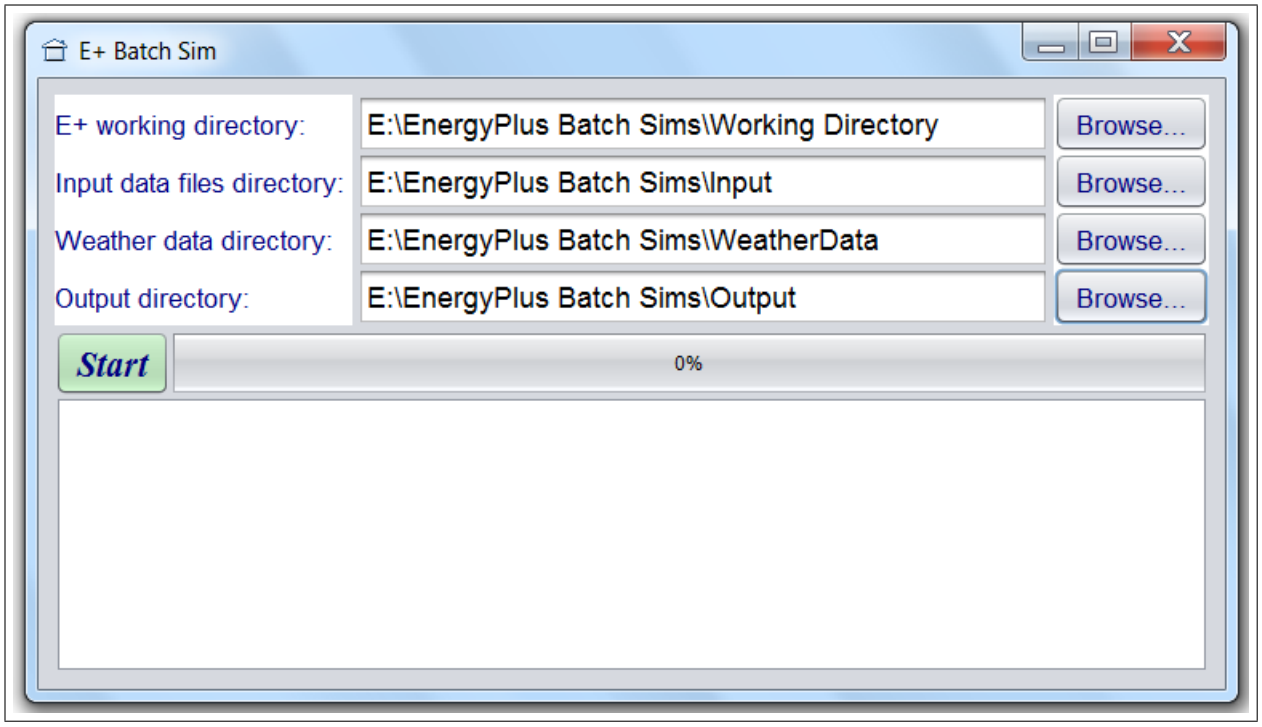

Figure A1: Front End GUI

"E+ working directory" is where EnergyPlus.exe and all the other required files such as *.dll, Energy+.idd etc. are located. This directory must also have a folder named "PostProcess" which contains ReadVarsESO application. These files are necessary to run EnergyPlus and post-process outputs. User can copy all the required files from default EnergyPlus installation directory e.g. `C:\EnergyPlusV8-4-0` to another location and use that as working directory. Figure A2 below gives an example.

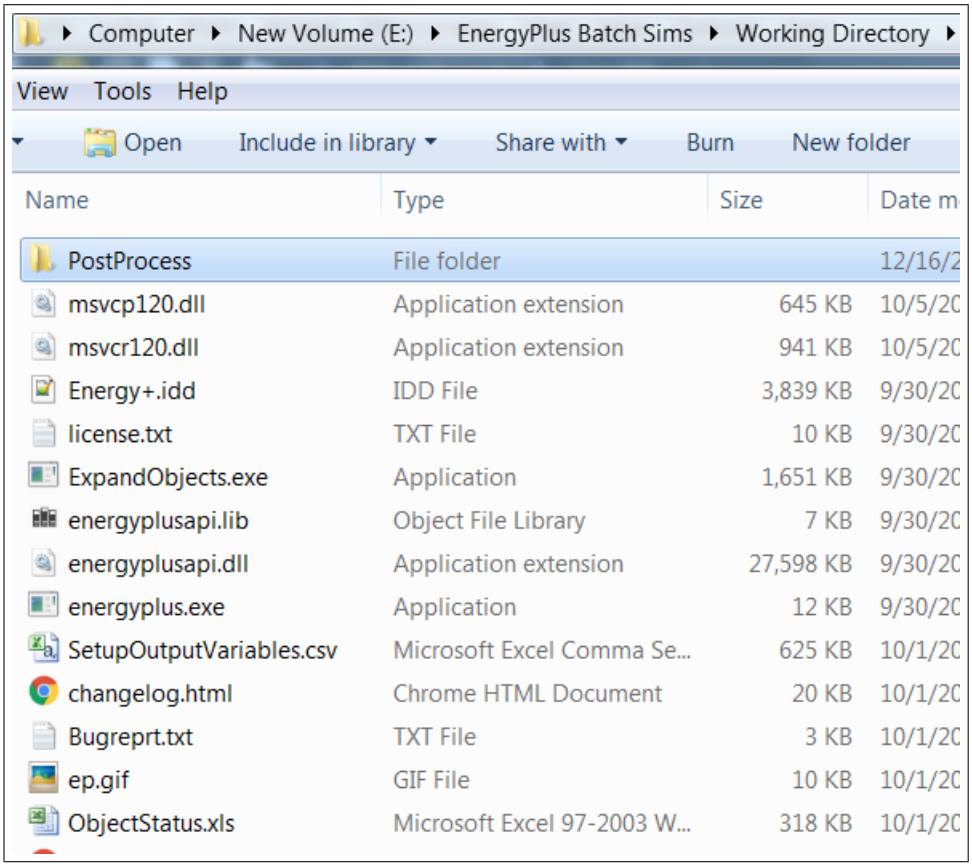

Figure A2: Working directory

"Input data files directory" has all the *.idf files. Figure A3 below gives example.

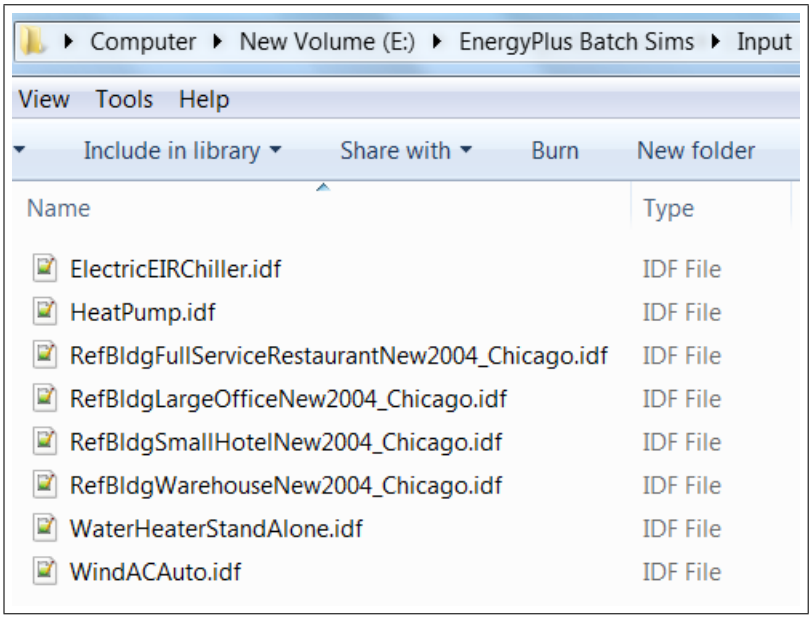

Figure A3: Input data files directory

"Weather data directory" contains all the *.epw files. Each input file will be run for each *.epw

file present in this directory. Figure A4 below shows a typical example.

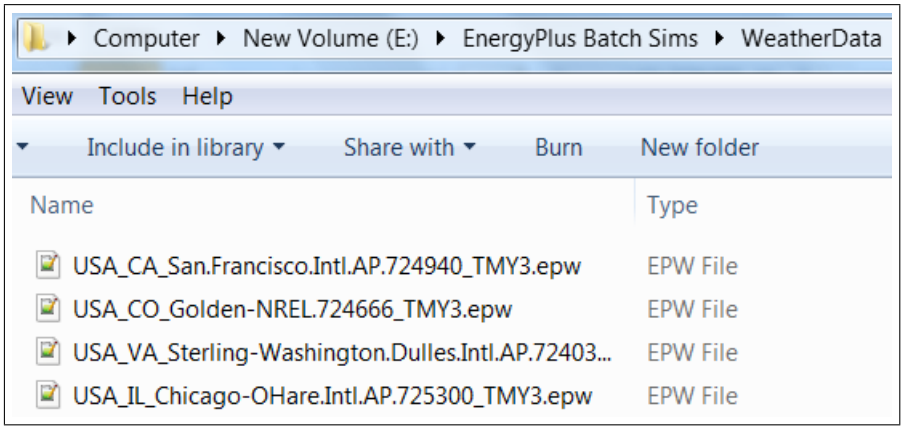

Figure A4: Weather data directory

Once the directory information is entered by the user, pressing *"Start"* button will launch the program.

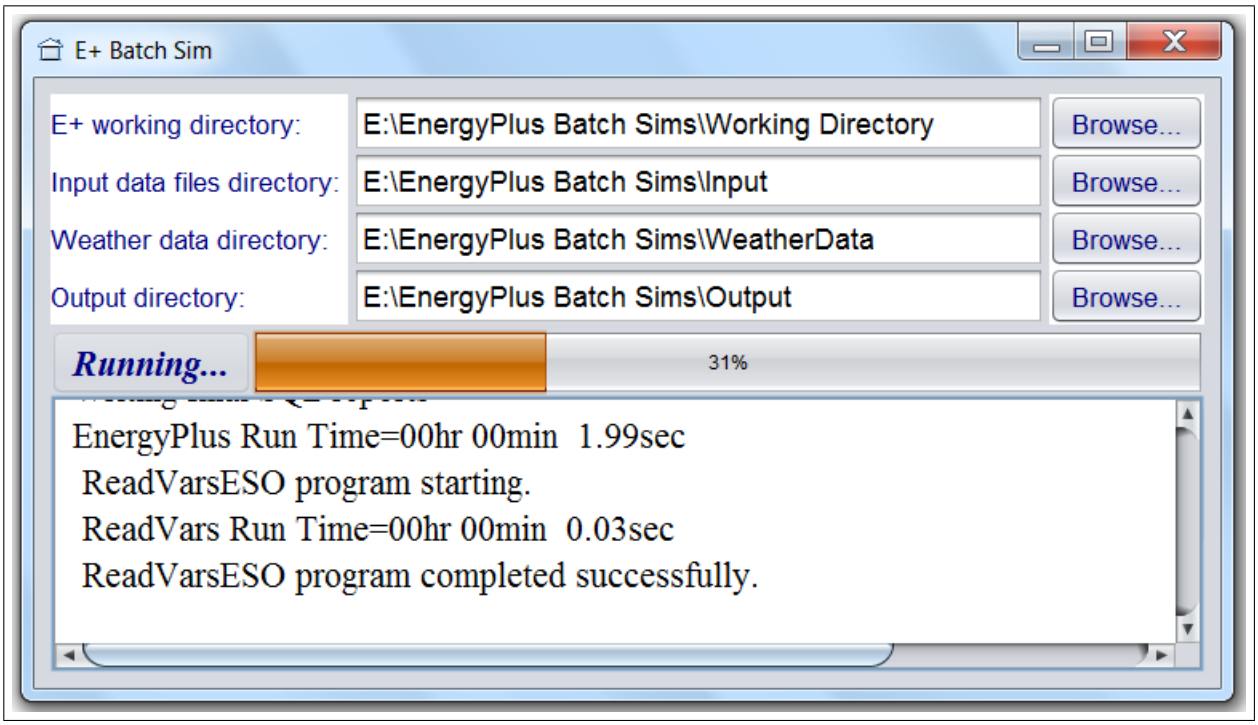

Figure A5: Program running

After all the simulations are completed, a completion message will appear informing user about number of simulations completed and time taken by the program to finish those simulations.

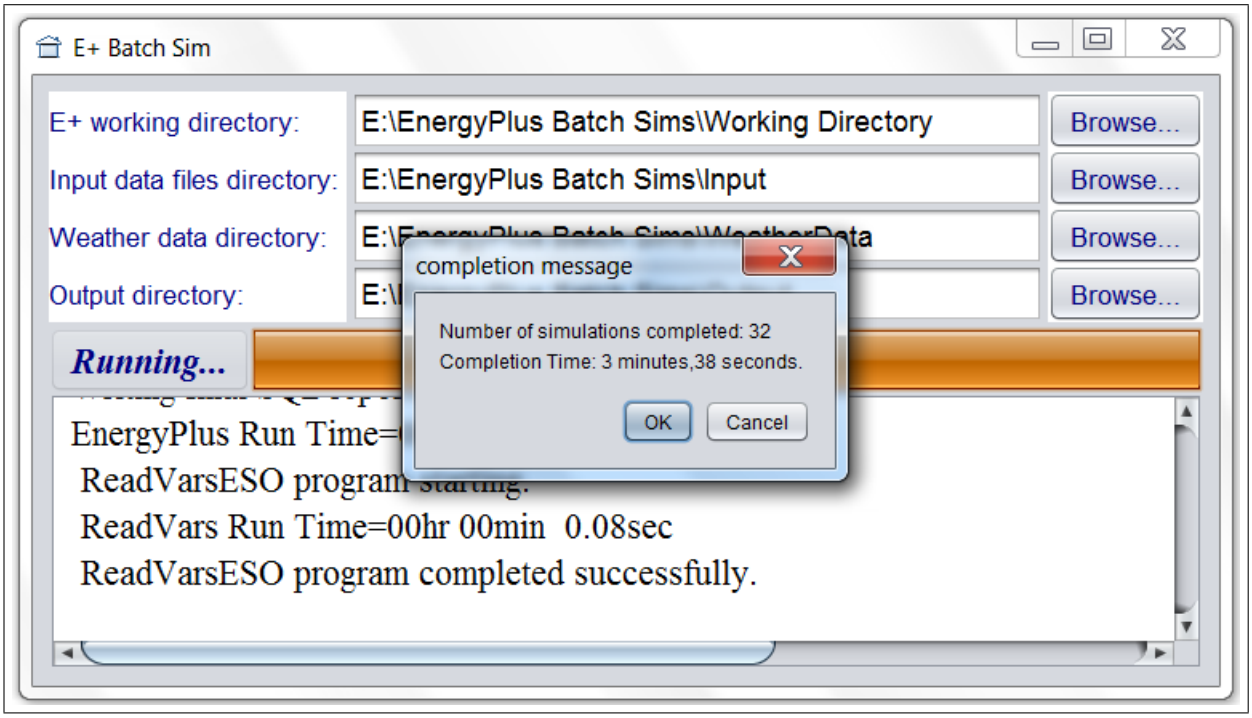

Figure A6: Program Completion Message

"Output directory" is where all the output files will be stored under location name folder as soon as they are generated by the program as seen in Figure A7 below. The weather location folders shown below are created by the program in the output directory specified by the user.

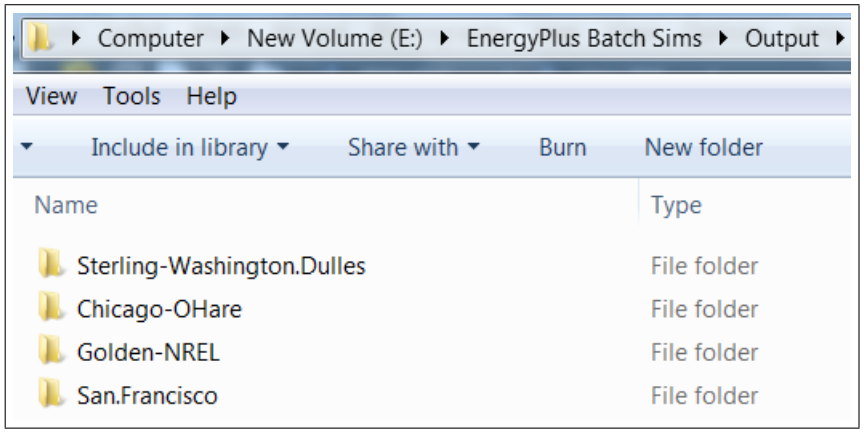

Figure A7: Output directory

Figure A8 below shows typical output folder files.

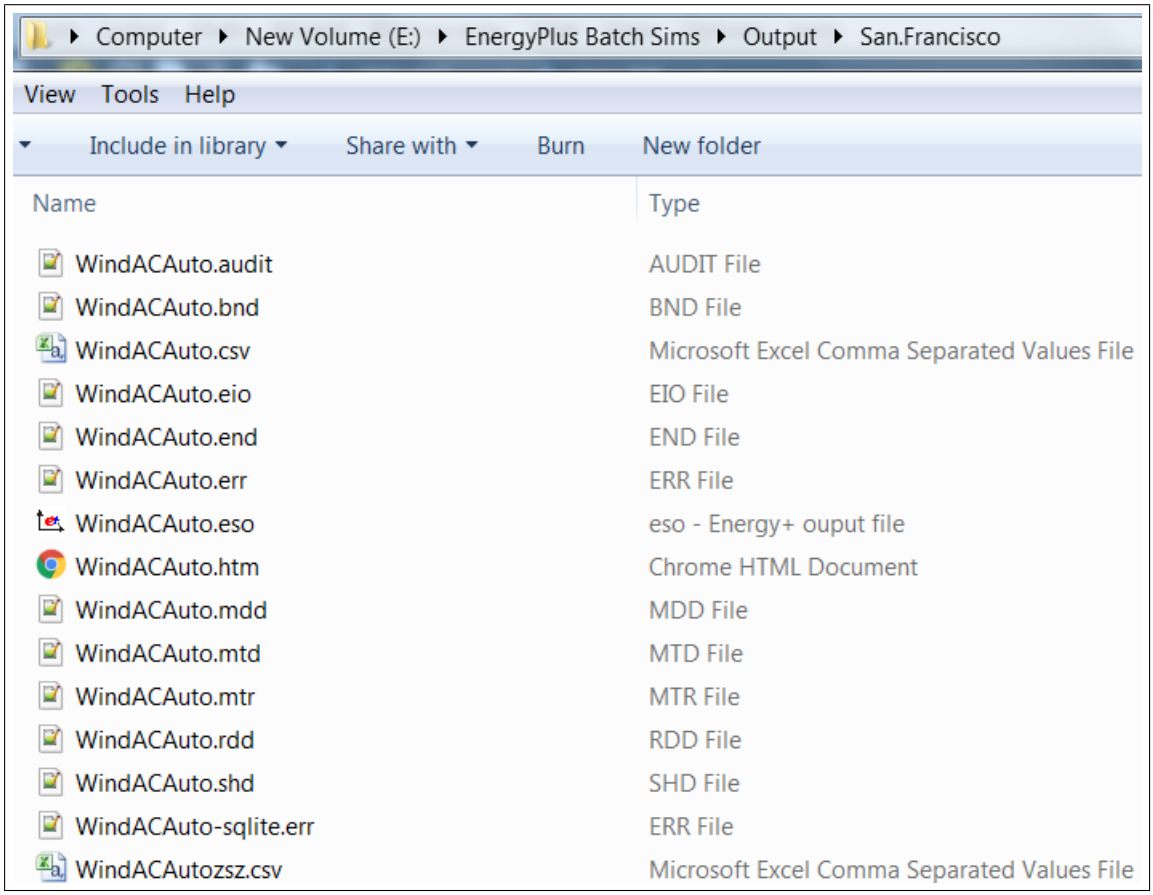

Figure A8: Output sub-directory

On Ubuntu, E+BatchSimulations.jar file should be made executable by right clicking the jar file and checking "Allow executing file as program" under Permissions tab as shown in Figure A9.

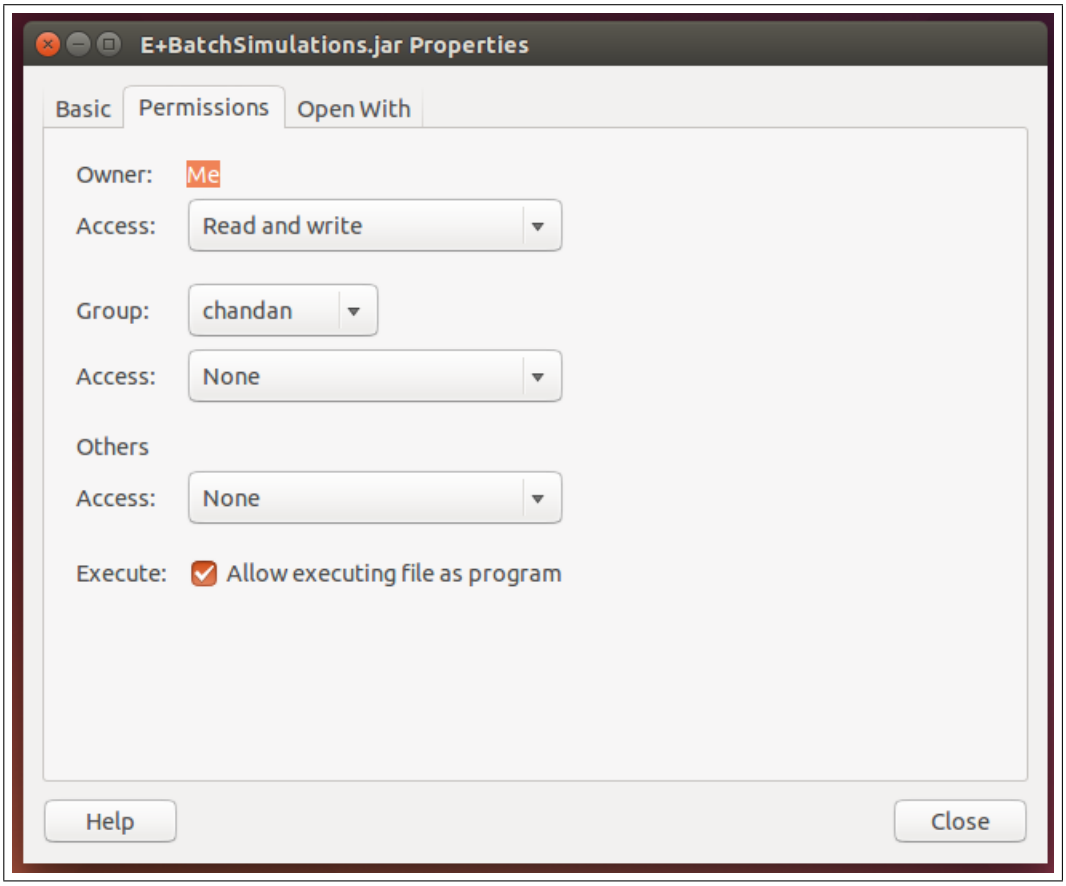

Figure A9: Ubuntu: Allow Executing File

Appendix B Transition EnergyPlus input files from older version to a newer version

The example below illustrates how to transition EnergyPlus input files from V8.0 to 8.3.

1. First, a list of all the EnergyPlus input files of older version with full path should be created.
2. The extension of file created above should be changed to ".lst".
3. Then in "IDFVersionUpdater" program that comes with EnergyPlus installation, "Choose File to Update" should be clicked and the ".lst" file created above should be selected. (IDFVersionUpdater for E+8.3 requires following files)
   - Transition-V8-0-0-to-V8-1-0.exe
   - Transition-V8-1-0-to-V8-2-0.exe
   - Transition-V8-2-0-to-V8-3-0.exe
   - V8-0-0-Energy+.idd
   - V8-1-0-Energy+.idd
   - V8-2-0-Energy+.idd
   - V8-3-0-Energy+.idd
4. *Important: In the "IDFVersionUpdater", "Delete Original File" should be checked. This saves time later.*
5. Once the files are updated (this can take several hours depending on number of input files to be transitioned from V8 to V8.3).
6. Once the files are transitioned, the directory with all the updated files can be used as Input files directory. Because this directory has only updated files and all the original files were already deleted. Other files such as .audit files created by "IDFVersionUpdater" or *htm files can be left there safely. Only idfs must be of EnergyPlus version used by the program.