User Manual: Partial Order Tool

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1 Download and Setup

The following steps need to be followed diligently for the correct setup of the tool in your machine.

STEP 1: **Pre- requisite:** User must have *Java SDK* installed in their machine.

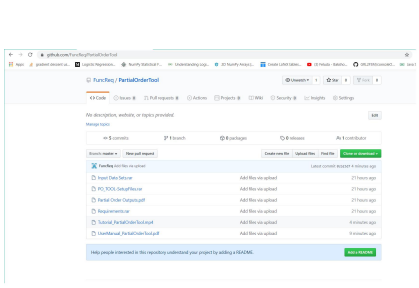
STEP 2: **Download:** User needs to download the following files from the github repository (refer to Figure 1(a)) for using the tool:

- *Requirements.rar:* It contains the requirements set for each of the five projects used for simulation in the research work (refer to Figure 1(b)). These requirement documents presents tables that captures the NFRs associated with each of the FR.
- *Input Data Sets.rar :* It consists of the data set corresponding to each of the five projects in separate folders (refer to Figure 1(c)). These data sets are to be used while running the tool.
- *PO_ TOOL-SetupFiles.rar:* It contains the `PartialOrderTool` installation files (refer to Figure 1(d)).

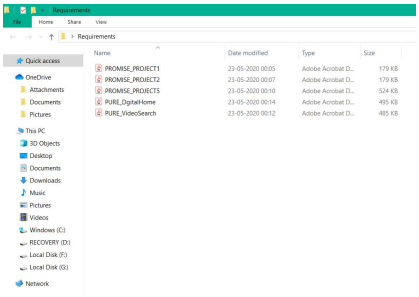
STEP 3: **Extract:** The downloaded RAR files need to be extracted at any sutaible location.

STEP 4: **Installing the tool:**

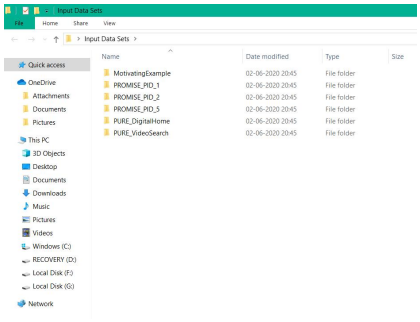
- Open the *PO_ TOOL-SetupFiles* folder.
- Right click on *PO_ Tool.msi* file and select *install* option (refer to Figure 2(a)).
- The installation wizard appears. Click on the *Next* button at the bottom of the wizard (refer to Figure 2(b)).
- Next select a suitable installation location and click on *Next* button (refer to boxed portion in Figure 2(c)).
- On the next screen of the wizard click on *Install* button at the bottom to start the installation process (refer to Figure 2(d)).
- Finally on completion of the installation click on *Finish* button to exit the wizard (refer to Figure 2(e)).



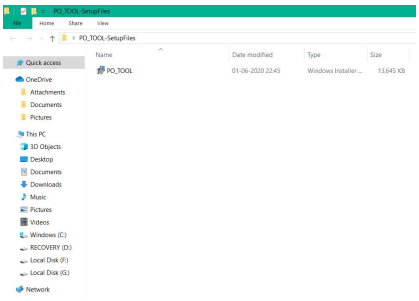
(a) Files available in repository



(b) Contents of Requirements folder



(c) Contents of Input Data Sets folder



(d) Contents of PO_TOOL-SetupFiles folder

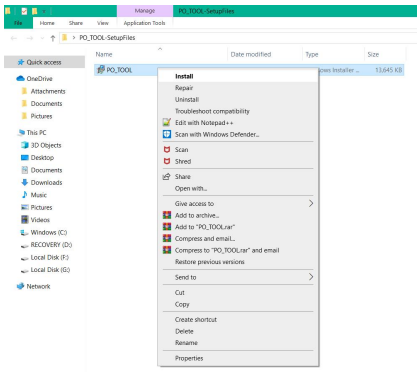
Figure 1: Files required for using the tool and understanding requirements sets

A folder named *Partial_ Order_ Tool* will be created in the selected location (refer to Figure 2(f)).

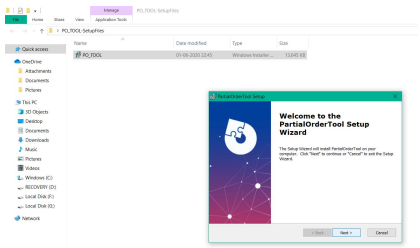
STEP 5: **Before running the tool:**

- The user may open *Requirements* folder and go through different requirements document to obtain a clear understanding of FR-NFR dependencies that are formulated for each project. The user may also observe that corresponding to each FR and NFR a label is assigned. The purpose of assigning these labels to make it use in the tool.
- In the *Input Data Sets* folder the corresponding input data sets for each of the projects are carefully constructed. There are three text files in each of the project folder -*DataSet1.txt, DataSet2.txt and DataSet3.txt* (refer to Figure 3(a)). The contents of these three files are as follows:

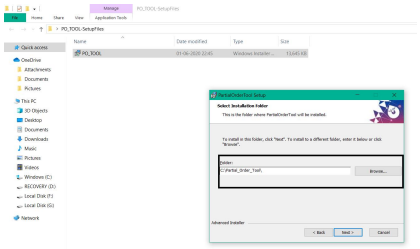
  (i) *DataSet1.txt* consists of three columns of input. First column stores the set of FRs, second column specifies the NFRs that associate with each FR and the third column provides the respective dependency values (refer to Figure 3(b)). The user can manipulate the dependency values as per choice. The rows with



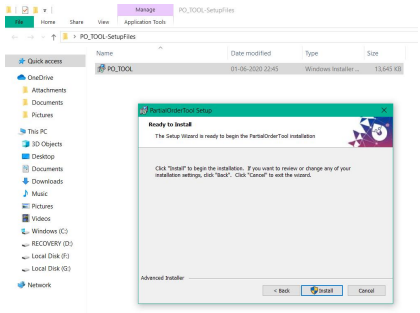
(a) Install option



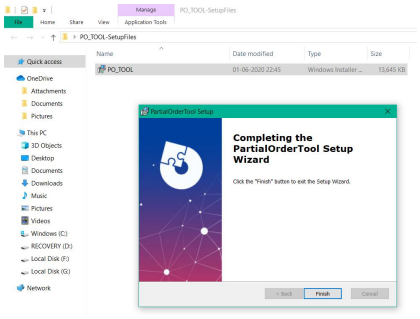
(b) Wizard opening screen



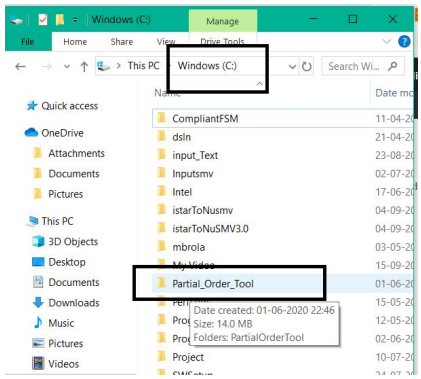
(c) Location for installation



(d) Beginning installation



(e) Completion of installation



(f) Folder created in selected location after installation

Figure 2: Installing the PartialOrder Tool

empty value in second and third column signifies that no NFR associate with that specific FR.

(ii) *DataSet2.txt* specifies the NFRs that are in conflict along with the degree of conflict among them (refer to Figure 3(c)). These

values are also subject to change. In this text file two NFR labels are written at first separated by a comma and then the degree of conflict after another comma.

(iii) *DataSet3.txt* specifies the temporal dependencies among FRs (refer to Figure 3(d)). Temporal dependency are specified by separating the FRs with a comma. The FR preceding the comma should temporally precede the one written after the comma.

It is to be noted that while changing the input text files user needs to follow exactly the existing format in each text file for succesfully using it as input.

2 Using the Partial_Order Tool

Once the above steps are done, users can start using the tool.

STEP 1: Open the folder *Partial_ Order_ Tool* (refer to Figure 4(a)).

STEP 2: Copy the input data sets files i.e. *DataSet1.txt, DataSet2.txt and DataSet3.txt* of anyone the project and paste it in the same location as that of *PartialOrderTool_ ver1.exe* i.e. inside the *Partial_ Order_ Tool* folder (refer to Figure 4(a)).

STEP 3: Now right click on the Tool icon (i.e. *PartialOrderTool_ ver1.exe*) and select *Open* option (refer to Figure 4(b)).

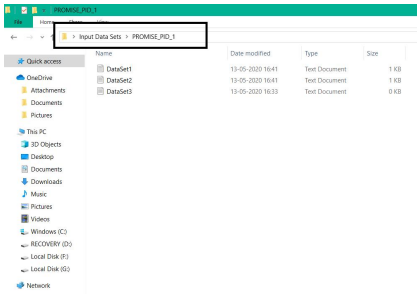
STEP 4: The tool interface opens (refer to Figure 4(c)).

STEP 5: In the left portion of the tool user can see the NFRs of the project whose input data files are copied in the directory same as that of the tool.

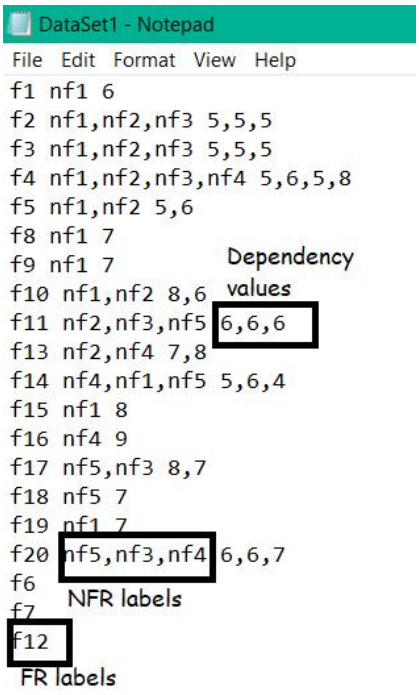
STEP 6: After each NFR label, there is an input text box. Users need to fill in these boxes with numeric values. These values will be used as the priority values assigned to the NFRs (refer to the boxed portion in Figure 4(d)).

STEP 7: Once all the values are assigned click on the *SAVE* button.

STEP 8: Now select any one of the parameters from the top right portion of the interface (refer to boxed portion in Figure 4(e)). In case of selecting parameter *Weighted Sum* specify the weight to be assigned by dragging the slider to a position. The value at the left portion of the slider indicates weight assigned to the conflict and right portion to the NFR priority (refer to the boxed portion in Figure 4(f)). In Figure 4(f) the slider is at position 0.4 which means weight assigned to conflict is 0.4 and that to NFR priority is 0.6. After selecting the parameter click on the *SUBMIT* button to set the parameter.

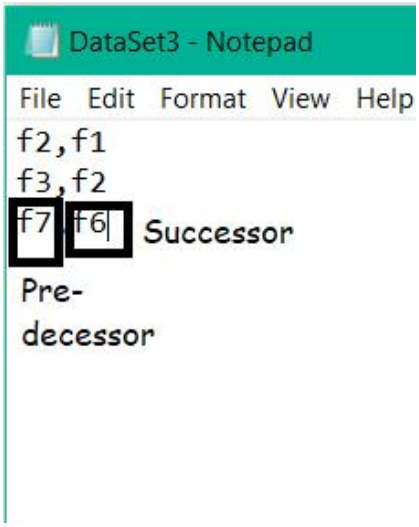


(a) Input data Files for the tool



(b) Contents of DataSet1.txt

(c) Contents of DataSet2.txt



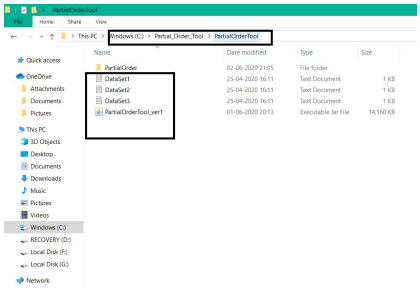
(d) Contents of DataSet3.txt

Figure 3: Input Data Sets for the Tool

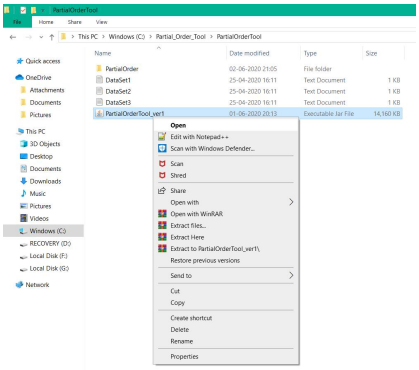
STEP 9: Click on the *GENERATE PARTIAL ORDER* button to generate the partial order for the input text files. Partial order in the form of linear sequence(s) will be displayed in the white area at the bottom of the interface (refer to Figure 5(a)).

STEP 10: Click on the *View PO graph* button to see the generated partial order in the form of a graph (refer to Figure 5(b)).

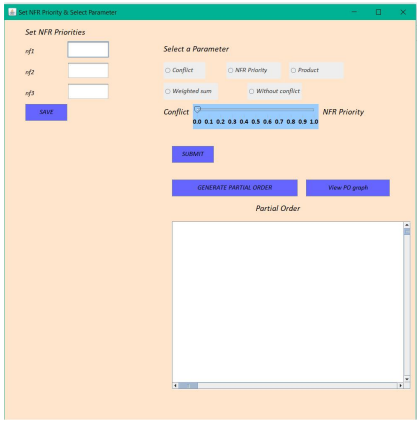
STEP 11: User can select any other parameter and subsequently repeat *Steps 8-10*.



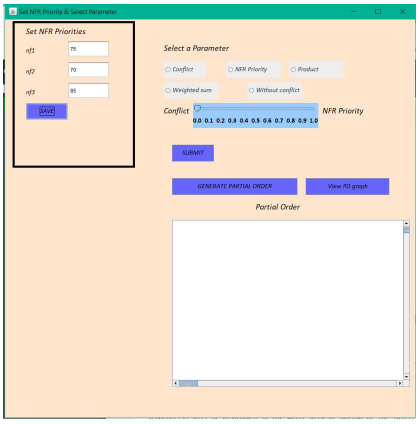
(a) Opening the folder containing the tool



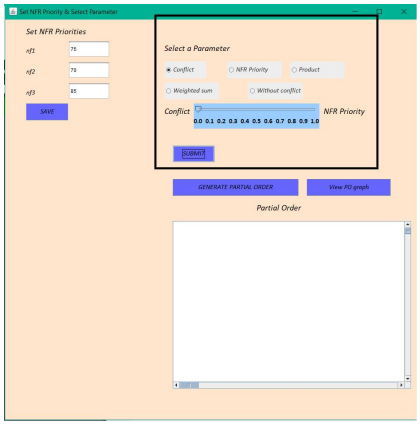
(b) Starting the tool



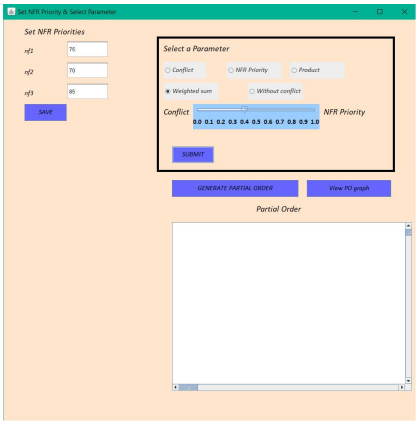
(c) Tool Interface



(d) Setting NFR Priority

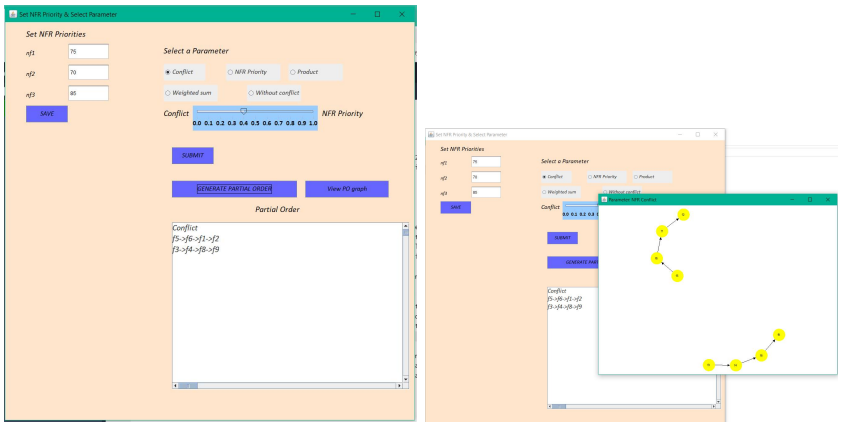


(e) Selecting Parameter



(f) Using the Slider

Figure 4: Using the Partial Order Tool



(a) Generated Partial Order (b) The partial order graph

Figure 5: Generated Partial Order