Knowledge Base

Abaqus/CAE plug-in to create a new part from picked cells of an existing 3D part

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Information

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QUESTION

How can I create a new part by picking cells of an existing part?

ANSWER

(The following applies to Abaqus 6.9 and higher.)

An Abaqus/CAE plug-in application for this purpose is attached below. This utility allows you to create a new part by picking cells of an existing part.

Installation

To install the plug-in, save the attached archive file to one of the following directories:

abaqus_dir\abaqus_plugins where *abaqus_dir* is the Abaqus parent directory

home_dir\abaqus_plugins where *home_dir* is your home directory

current_dir\abaqus_plugins where *current_dir* is the current directory

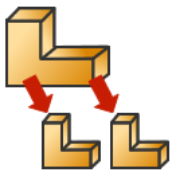
Note that if the abaqus_plugins directory does not exist in the desired path, it must be created. The *plugin_dir* directory can also be used, where *plugin_dir* is a directory specified in the abaqus_v6.env file by the environment variable **plugin_central_dir**. You can store plug-ins in a central location that can be accessed by all users at your site if the directory to which **plugin_central_dir** refers is mounted on a file system that all users can access. For example,

```
plugin_central_dir = r'\\fileServer\sharedDirectory'
```

On Windows platforms, right click on the archive file and select **WinZip** → **Extract to here**. On Linux platforms, type **unzip CreatePartsFromCells.zip** at the command prompt. A folder named abq_CreatePartsFromCells and a file named createPartsFromCells_plugin.py will be extracted. Note that the plug-in will not function properly if this procedure is not followed.

Usage

From the **Part** module, a new toolbar named **Create Parts By Picking Cells** will be available. This toolbar contains one icon:



After clicking on the icon, Abaqus/CAE prompts you to pick cells from the original 3D part. For example, as shown in Figure 1 certain cells of the original part are picked. After the pick procedure is committed the plug-in creates two new parts in the same model. The first new part contains only the cells that were picked (Figure 2). It is named as <*original3DPartName*>_picked_<*count*>. The second new part contains only the cells that were not picked (Figure 3). It is named as <*original3DPartName*>_notPicked_<*count*> The original part is not modified. The names of the newly created parts are printed in the message area of Abaqus/CAE.

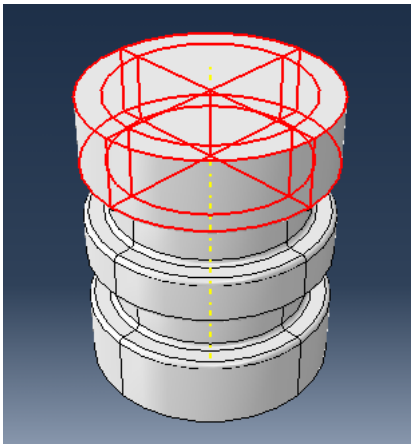


Figure 1: Picked cells of a 3D Part

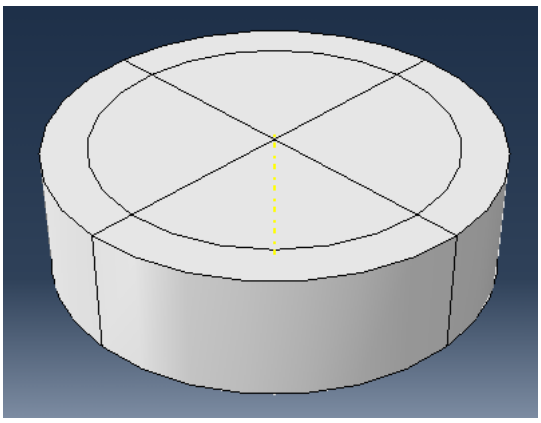


Figure 2: New part created from the picked cells

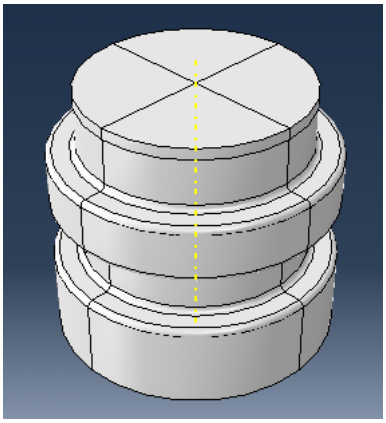


Figure 3: New part created from the non-picked cells

Applications

- When the meshing techniques applied to adjacent regions of a three-dimensional part or part instance are not compatible, it is not possible to generate a compatible mesh. In this case Abaqus/CAE automatically generates tie constraints across the incompatible interfaces. It automatically chooses one side of the interface as the slave surface and the other as the master surface. These tie constraints can be node based or surface based. Sometimes users prefer surface based constraints; in this situation this plug-in can be used to create the separate parts from the cells of the original part, the newly created parts can be instanced and surface to surface tie constraints can be interactively created in Abaqus/CAE. When creating tie constraints, you can choose the master and slave surfaces according to your needs.

- Because of bug SIR-101103 (corrected in 6.11-1) Abaqus/CAE does not automatically create tie constraints when attempting to mesh across an interface with first-order elements on one side of the interface and second-order elements of the same shape on the other side. As described above this plug-in can be useful in this situation to create the tie constraints interactively.

Notes

1. The plug-in can be used only with 3D parts that contain cells.

2. The performance of the plug-in can degrade if the original part has a very large number of cells.

Revision History

22 Sept 10	Release 1.1-1

Disclaimer

The attachments to this article are subject to certain usage conditions. Please click here for details.

KEYWORDS **plug-in, plugin, part, partition, cell**

ATTACHMENT answer_4577_picture1.png | answer_4577_picture4.png | answer_4577_picture3.png | answer_4577_picture2.png | CreatePartsFromCells.zip

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