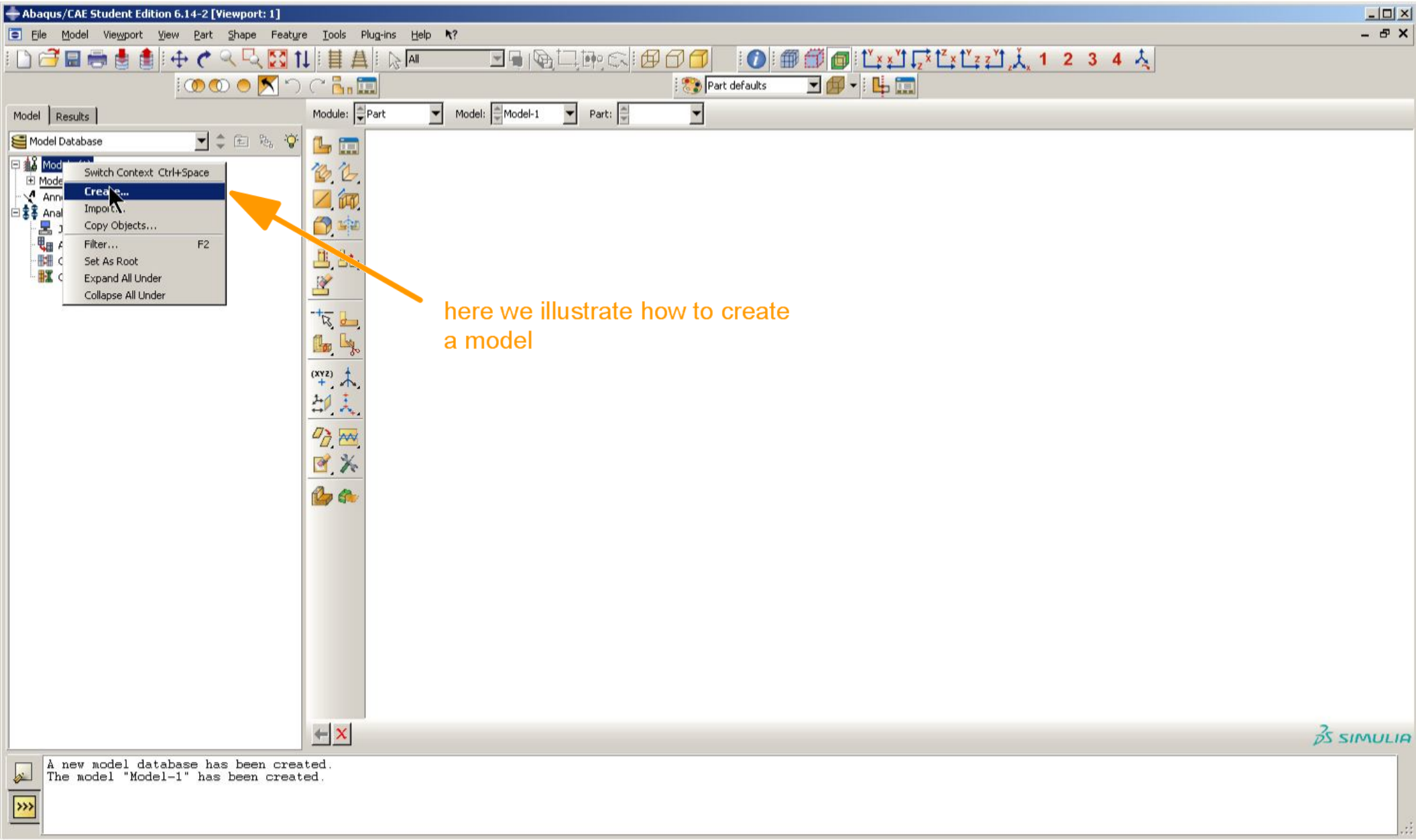
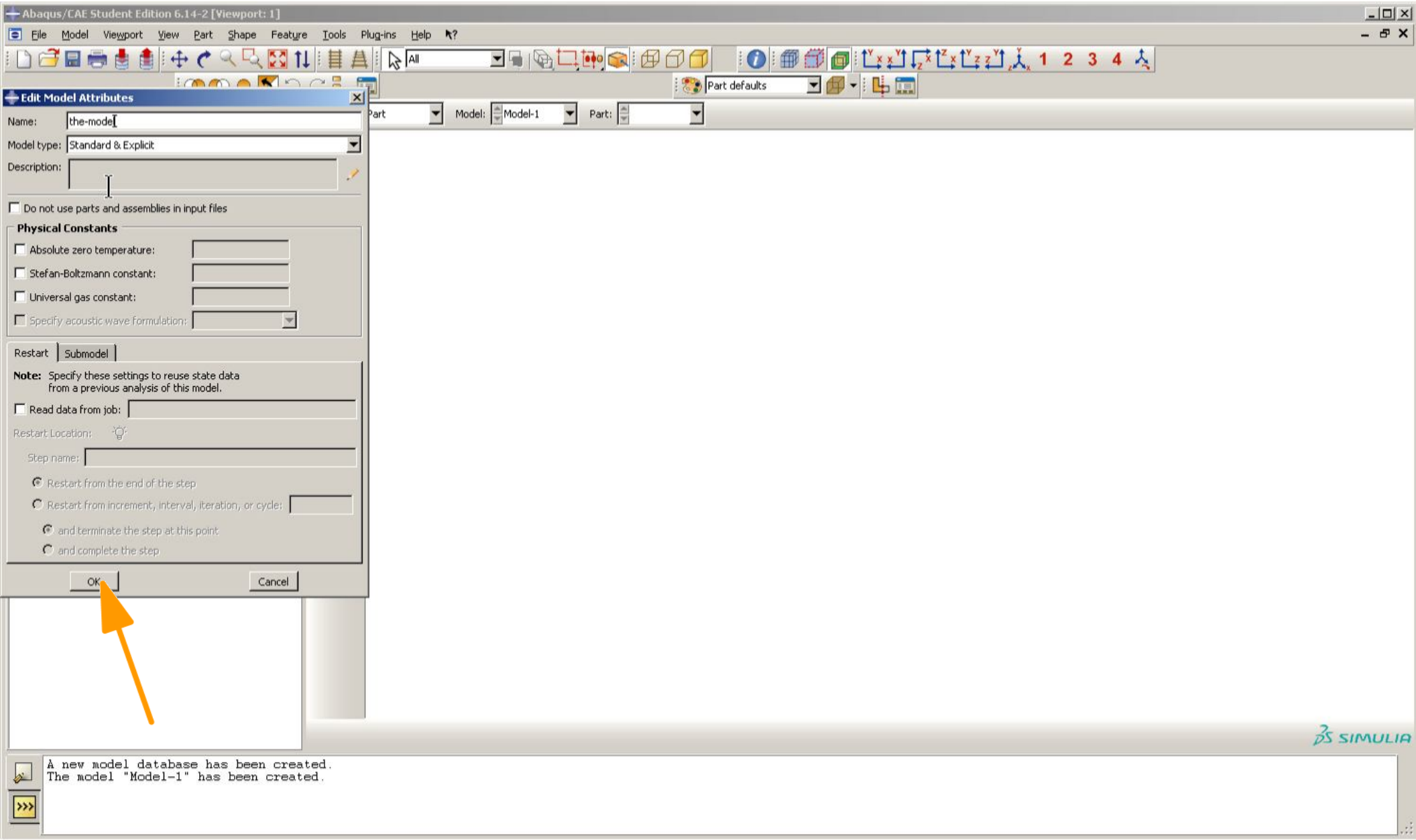
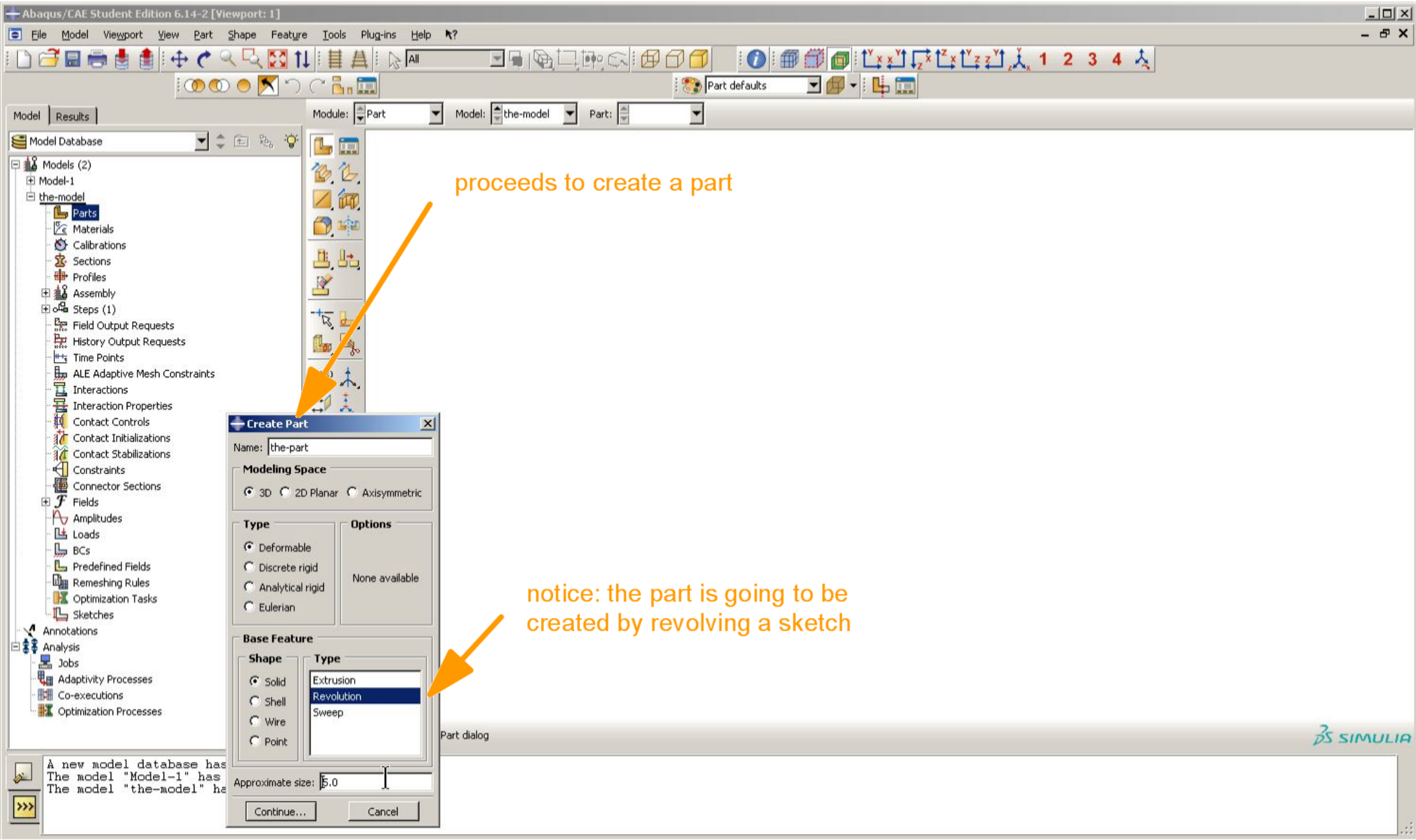
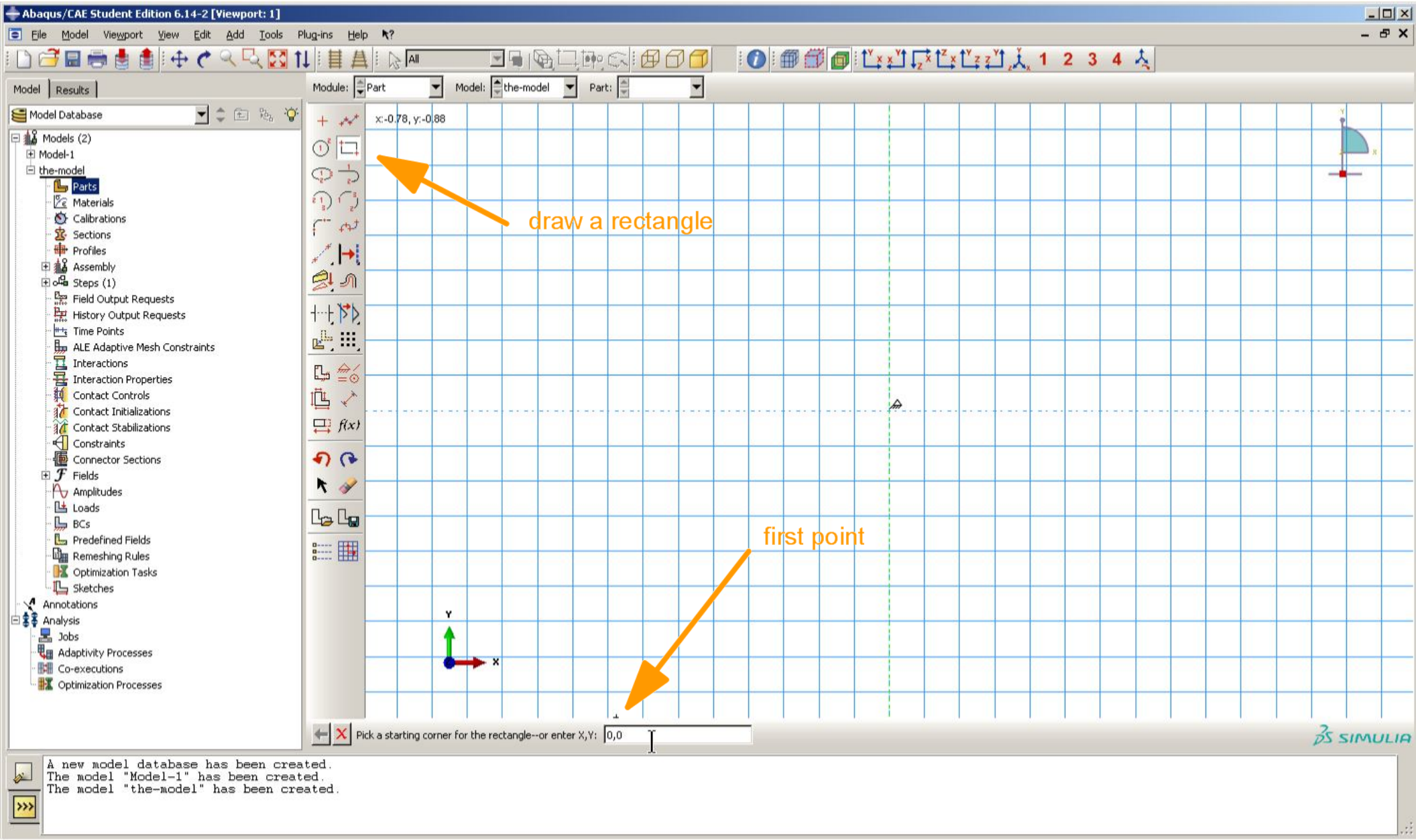
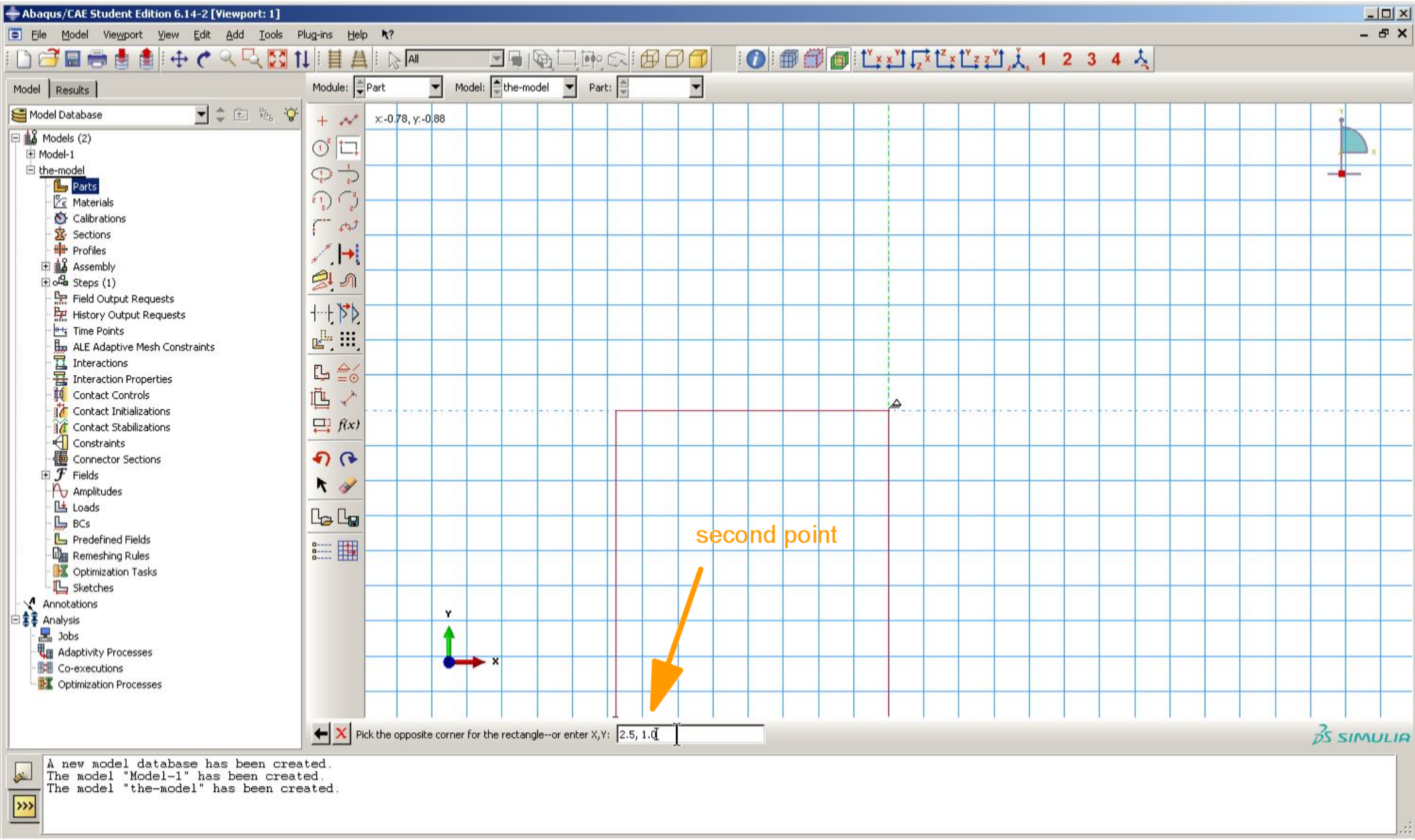
Concrete column, with hydration heat load, and immersed in ice water: reduced-size model

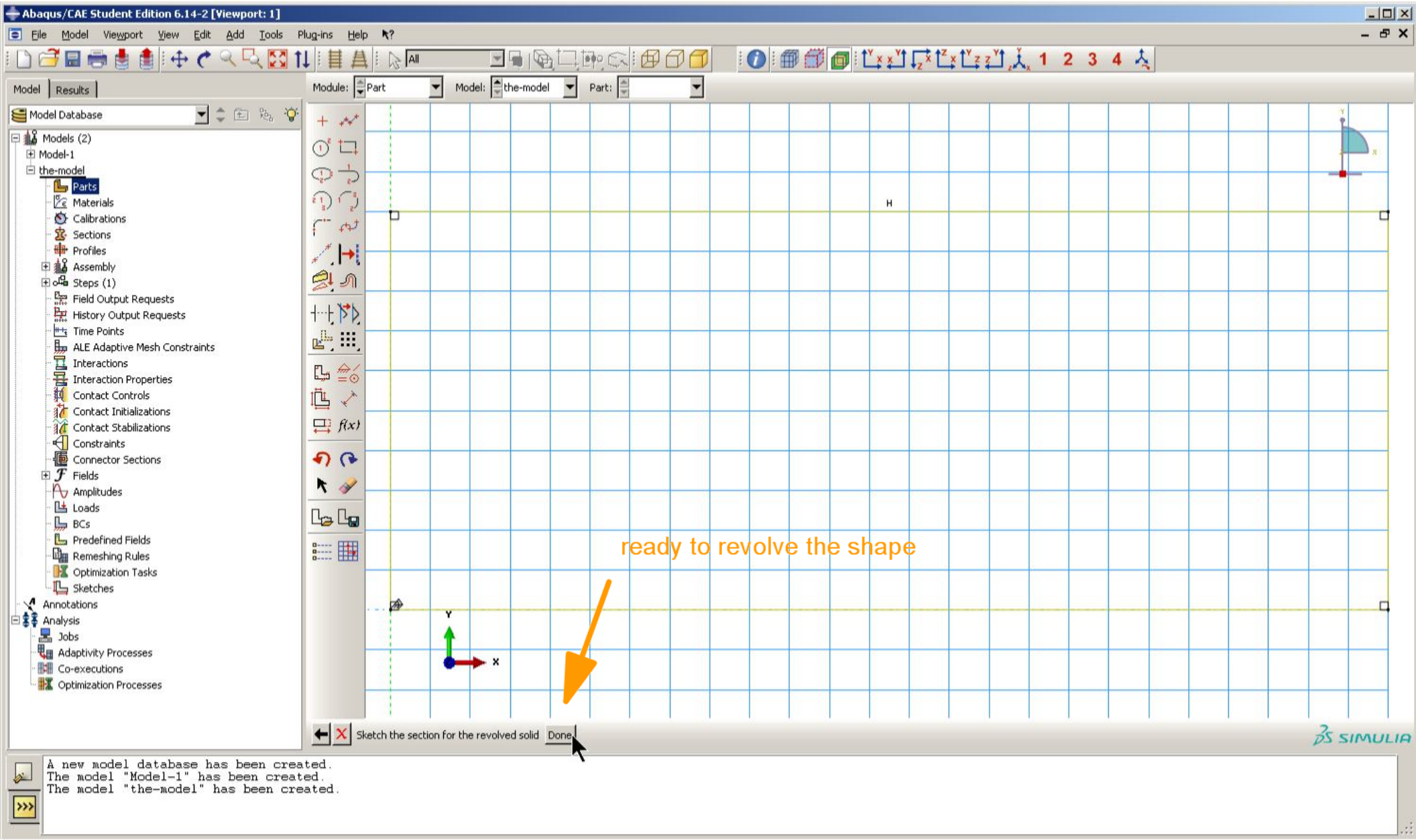


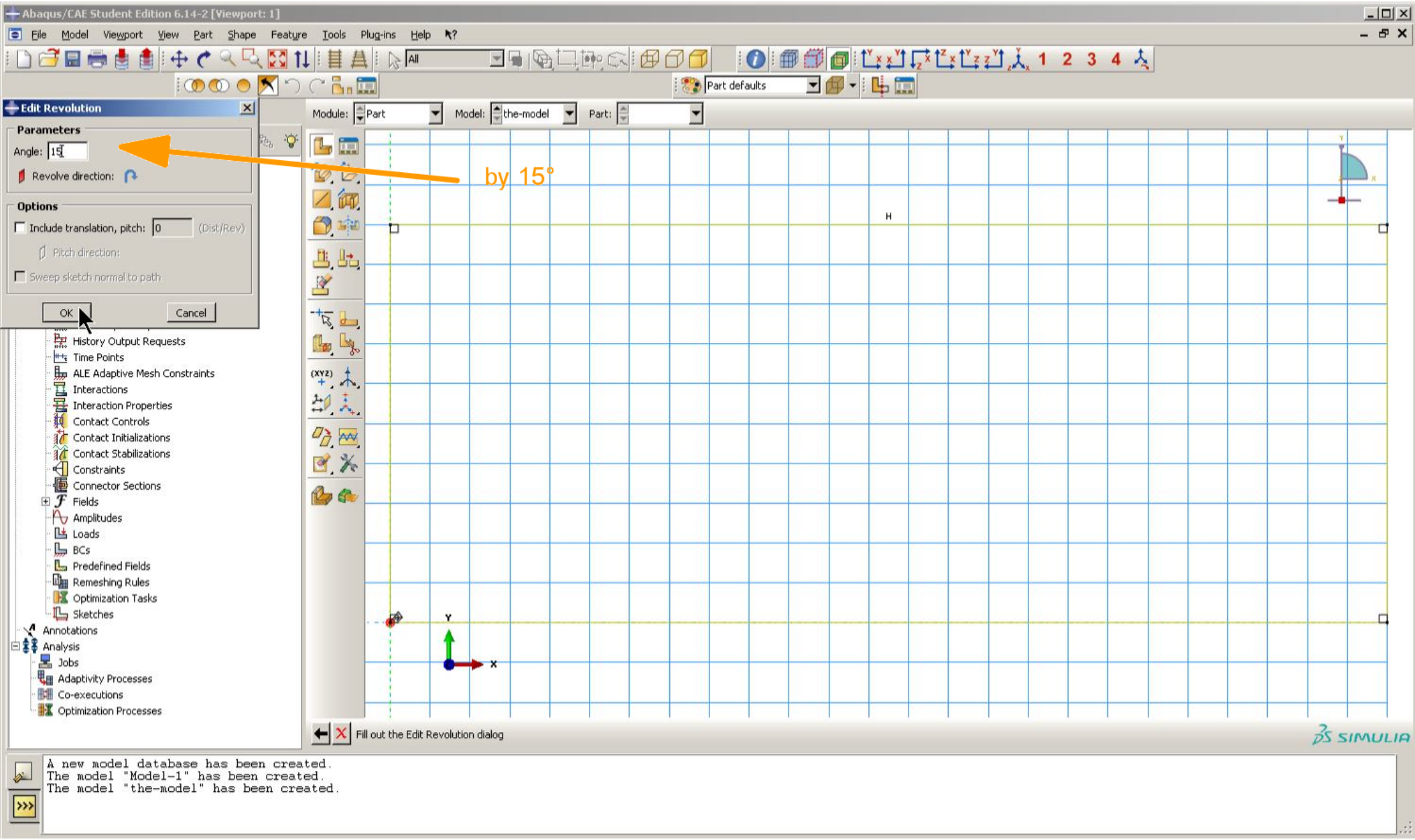

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Part Shape Feature Tools Plug-ins Help
Edit Model Attributes
Name: the-model
Model type: Standard & Explicit
Description:
Do not use parts and assemblies in input files
Physical Constants
Absolute zero temperature:
Stefan-Boltzmann constant:
Universal gas constant:
Specify acoustic wave formulation:
Restart
Submodel
Note: Specify these settings to reuse state data from a previous analysis of this model.
Read data from job:
Restart Location:
Step name:
Restart from the end of the step
Restart from increment, interval, iteration, or cycle:
and terminate the step at this point
and complete the step
OK
Cancel
Part defaults
Model: Model-1
Part:
SIMULIA
A new model database has been created.
The model "Model-1" has been created.

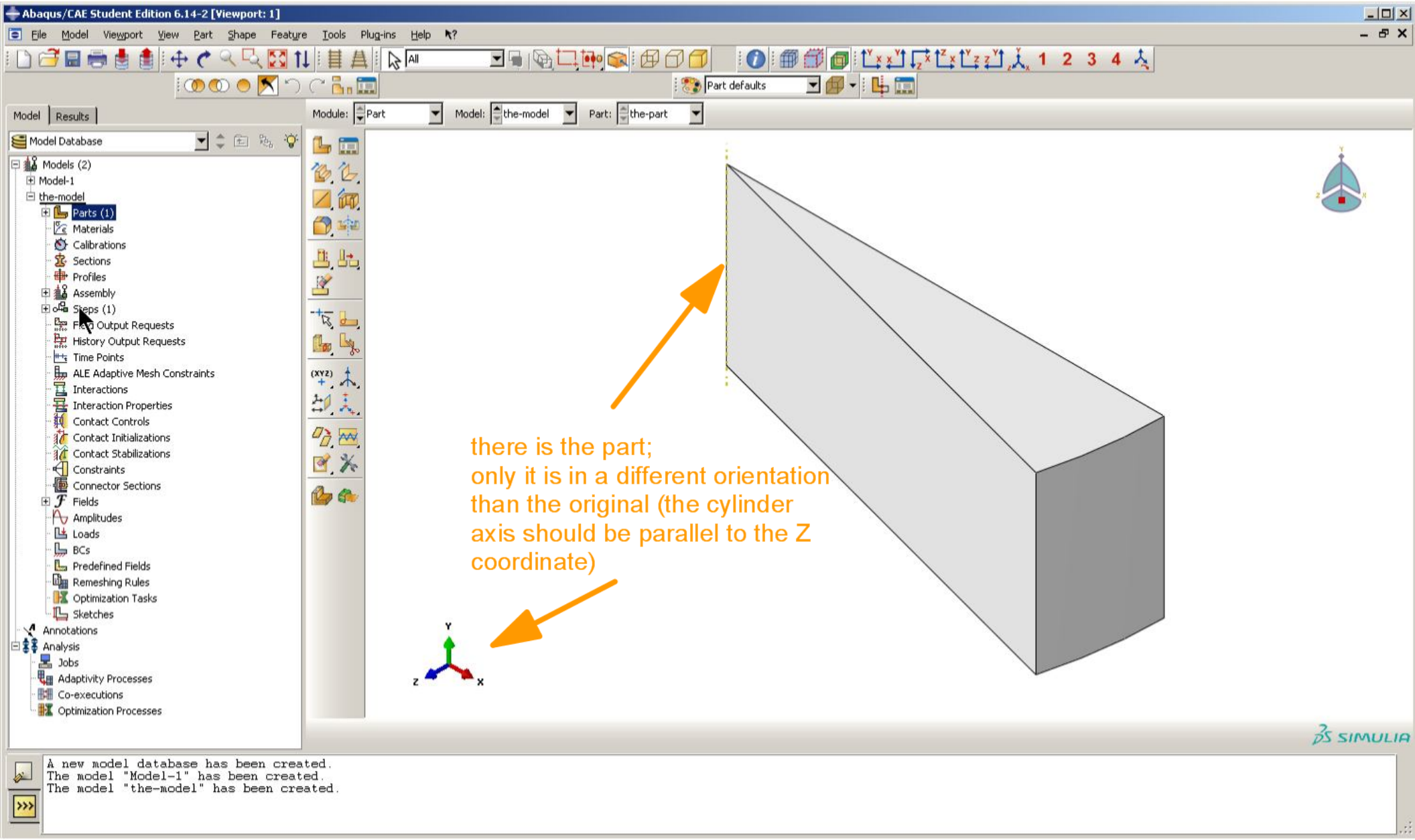

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Part Shape Feature Tools Plug-ins Help
Model Results
Module: Part Model: the-model Part:
Model Database
Models (2)
Model-1
the-model
Parts
Materials
Calibrations
Sections
Profiles
Assembly
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Contact Stabilizations
Constraints
Connector Sections
Fields
Amplitudes
Loads
BCs
Predefined Fields
Remeshing Rules
Optimization Tasks
Sketches
Annotations
Analysis
Jobs
Adaptivity Processes
Co-executions
Optimization Processes
proceeds to create a part
Create Part
Name: the-part
Modeling Space
3D 2D Planar Axisymmetric
Type
Deformable
Discrete rigid
Analytical rigid
Eulerian
Options
None available
Base Feature
Shape
Solid
Shell
Wire
Point
Type
Extrusion
Revolution
Sweep
Approximate size: 5.0
Continue... Cancel
notice: the part is going to be created by revolving a sketch
Part dialog
SIMULIA
A new model database has
The model "Model-1" has
The model "the-model" ha

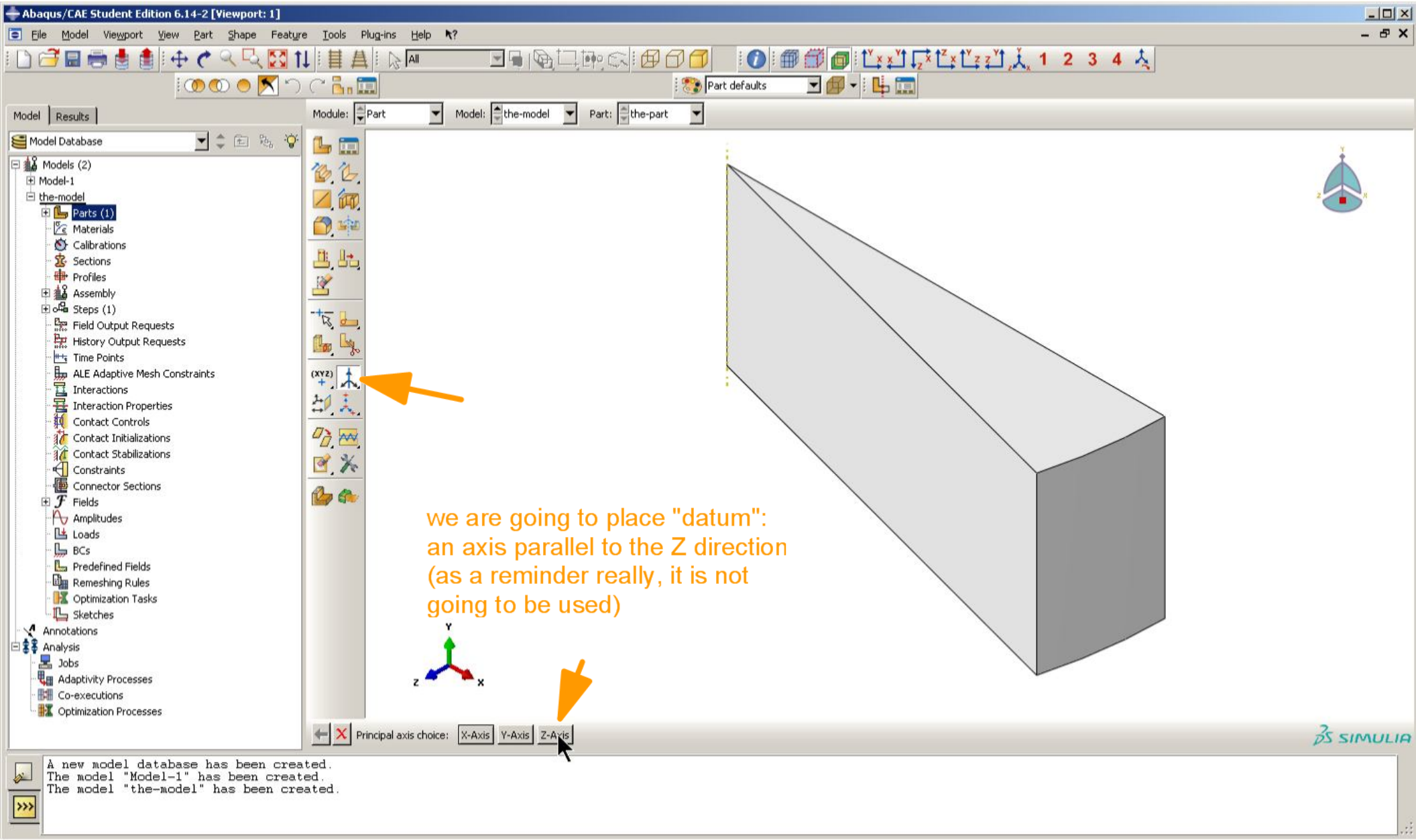

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Edit Add Tools Plug-ins Help
Module: Part
Model: the-model
Part:
Model Results
Model Database
Models (2)
Model-1
the-model
Parts
Materials
Calibrations
Sections
Profiles
Assembly
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Contact Stabilizations
Constraints
Connector Sections
Fields
Amplitudes
Loads
BCs
Predefined Fields
Remeshing Rules
Optimization Tasks
Sketches
Annotations
Analysis
Jobs
Adaptivity Processes
Co-executions
Optimization Processes
x:-0.78, y:-0.88
draw a rectangle
first point
Y
X
Pick a starting corner for the rectangle--or enter X,Y:
0,0
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.

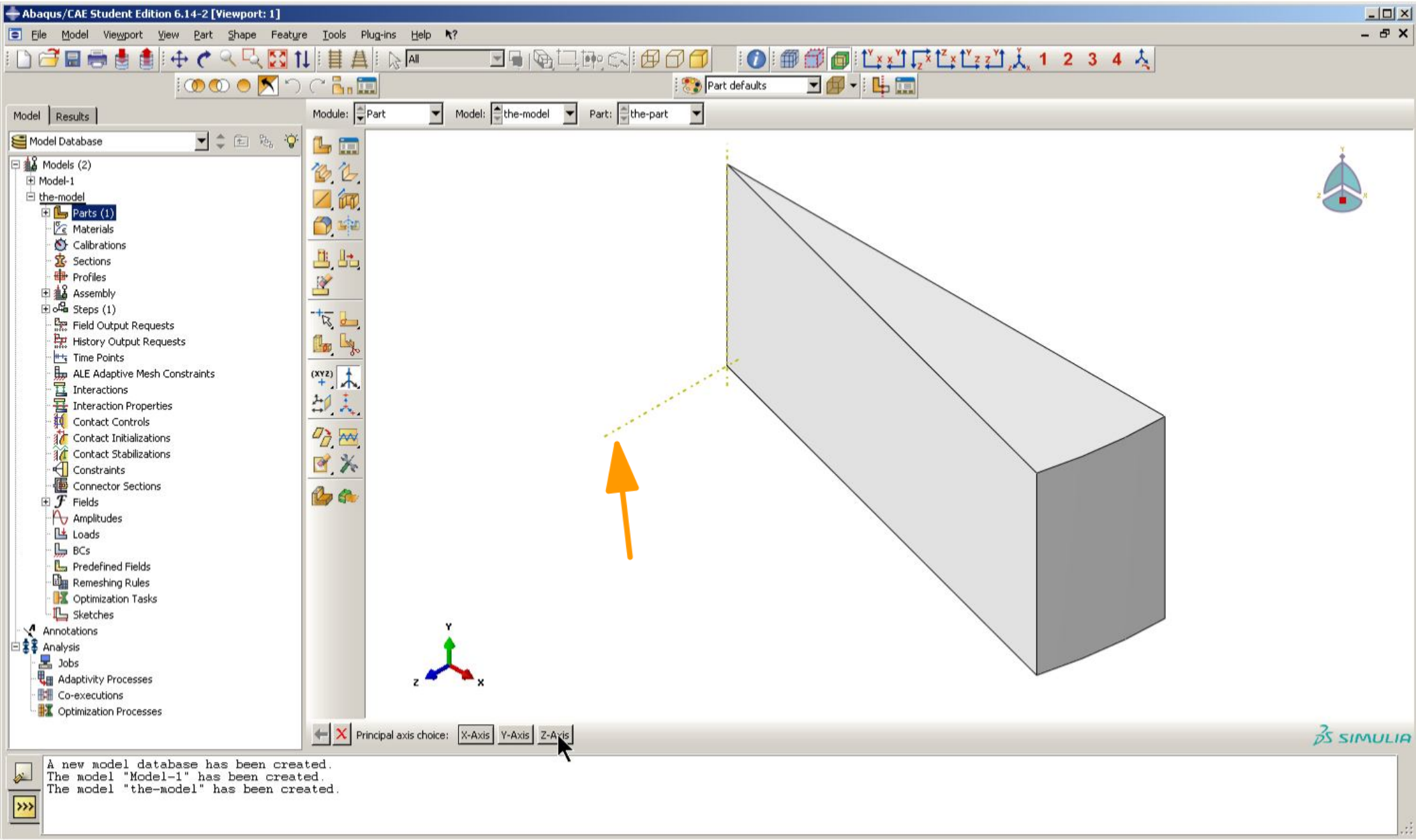

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Edit Add Tools Plug-ins Help
Model Results
Module: Part
Model: the-model
Part:
Model Database
Models (2)
Model-1
the-model
Parts
Materials
Calibrations
Sections
Profiles
Assembly
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Contact Stabilizations
Constraints
Connector Sections
Fields
Amplitudes
Loads
BCs
Predefined Fields
Remeshing Rules
Optimization Tasks
Sketches
Annotations
Analysis
Jobs
Adaptivity Processes
Co-executions
Optimization Processes
x:-0.78, y:-0.88
second point
Pick the opposite corner for the rectangle--or enter X,Y:
2.5, 1.0
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.

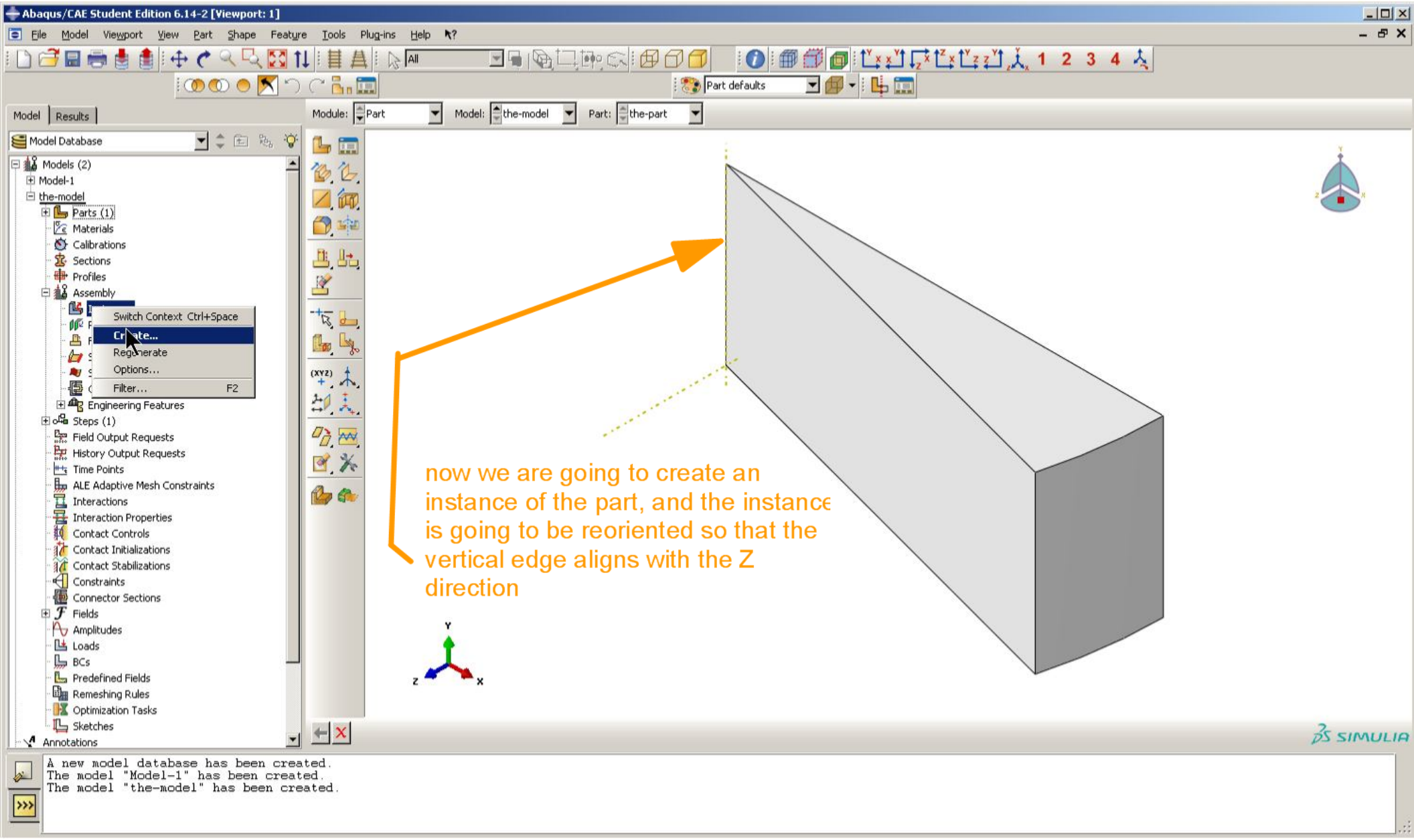

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Edit Add Tools Plug-ins Help
Model Results
Module: Part Model: the-model Part:
Model Database
Models (2)
Model-1
the-model
Parts
Materials
Calibrations
Sections
Profiles
Assembly
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Contact Stabilizations
Constraints
Connector Sections
Fields
Amplitudes
Loads
BCs
Predefined Fields
Remeshing Rules
Optimization Tasks
Sketches
Annotations
Analysis
Jobs
Adaptivity Processes
Co-executions
Optimization Processes
ready to revolve the shape
Sketch the section for the revolved solid
Done
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.

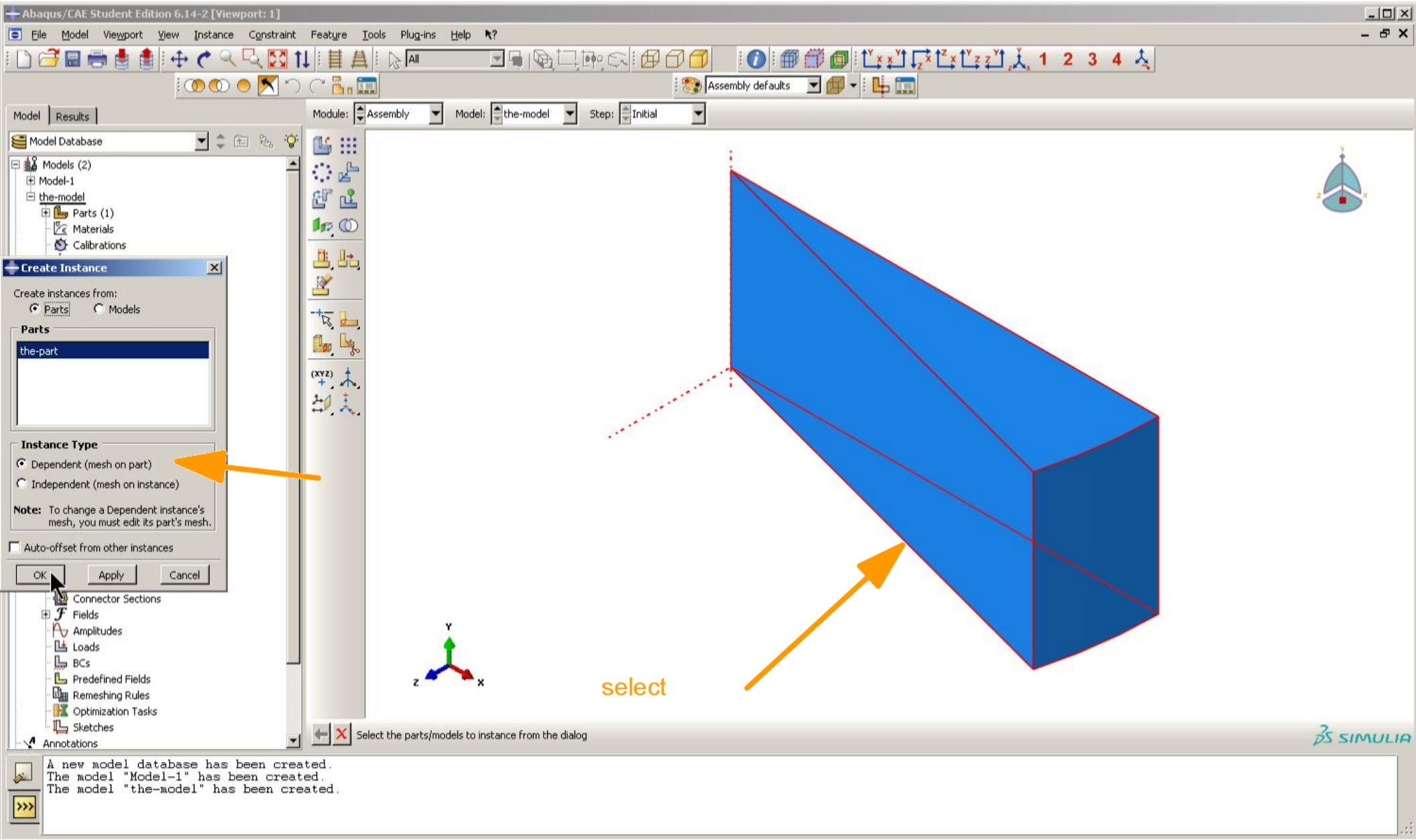

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Part Shape Feature Tools Plug-ins Help
Edit Revolution
Parameters
Angle: 15
Revolve direction:
Options
Include translation, pitch: 0 (Dist/Rev)
Pitch direction:
Sweep sketch normal to path
OK
Cancel
by 15°
Module: Part
Model: the-model
Part:
Part defaults
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Contact Stabilizations
Constraints
Connector Sections
Fields
Amplitudes
Loads
BCs
Predefined Fields
Remeshing Rules
Optimization Tasks
Sketches
Annotations
Analysis
Jobs
Adaptivity Processes
Co-executions
Optimization Processes
Fill out the Edit Revolution dialog
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.

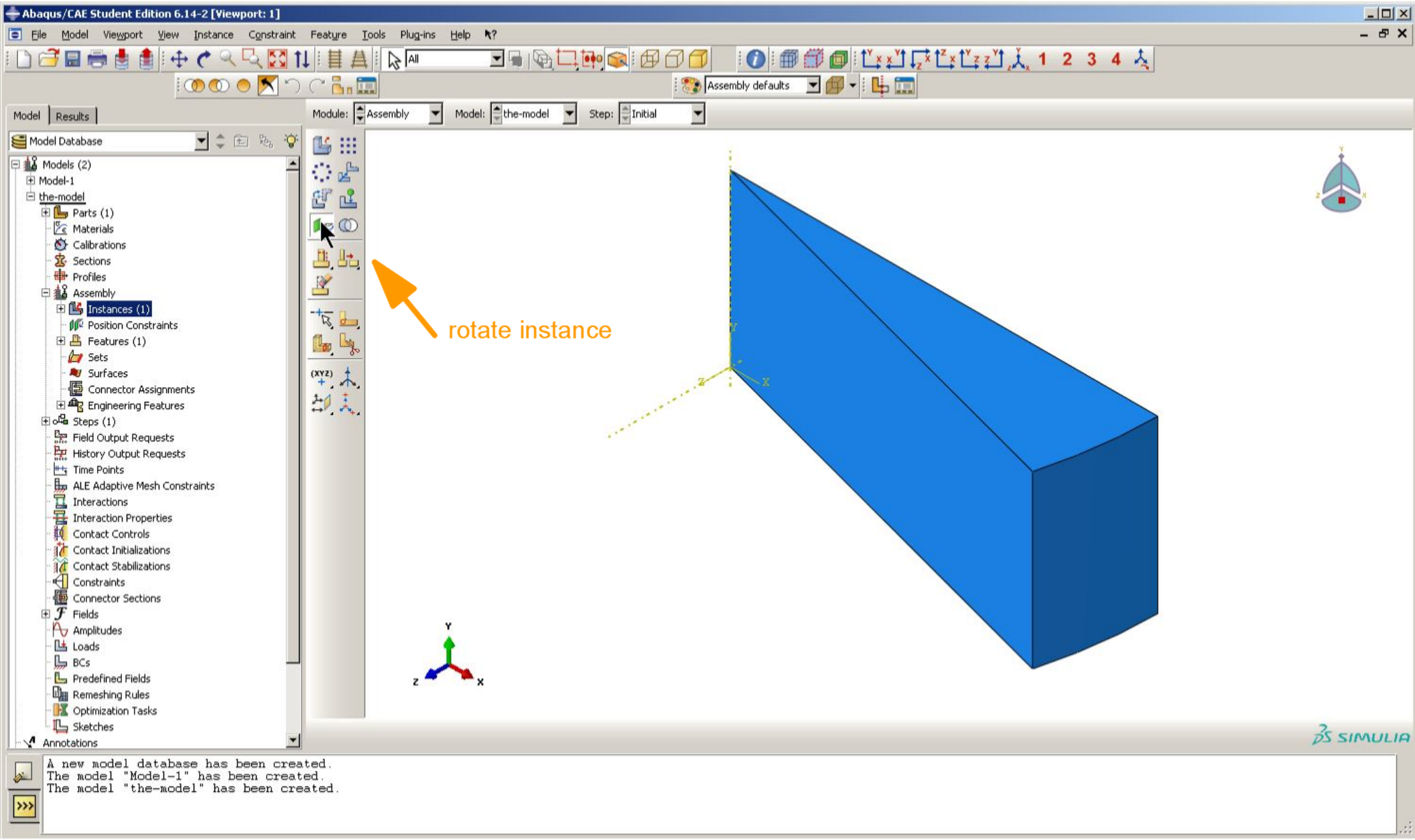

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Part Shape Feature Tools Plug-ins Help
Model Results
Module: Part Model: the-model Part: the-part
Model Database
Models (2)
Model-1
the-model
Parts (1)
Materials
Calibrations
Sections
Profiles
Assembly
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Contact Stabilizations
Constraints
Connector Sections
Fields
Amplitudes
Loads
BCs
Predefined Fields
Remeshing Rules
Optimization Tasks
Sketches
Annotations
Analysis
Jobs
Adaptivity Processes
Co-executions
Optimization Processes
there is the part;
only it is in a different orientation
than the original (the cylinder
axis should be parallel to the Z
coordinate)
Y
Z
X
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.

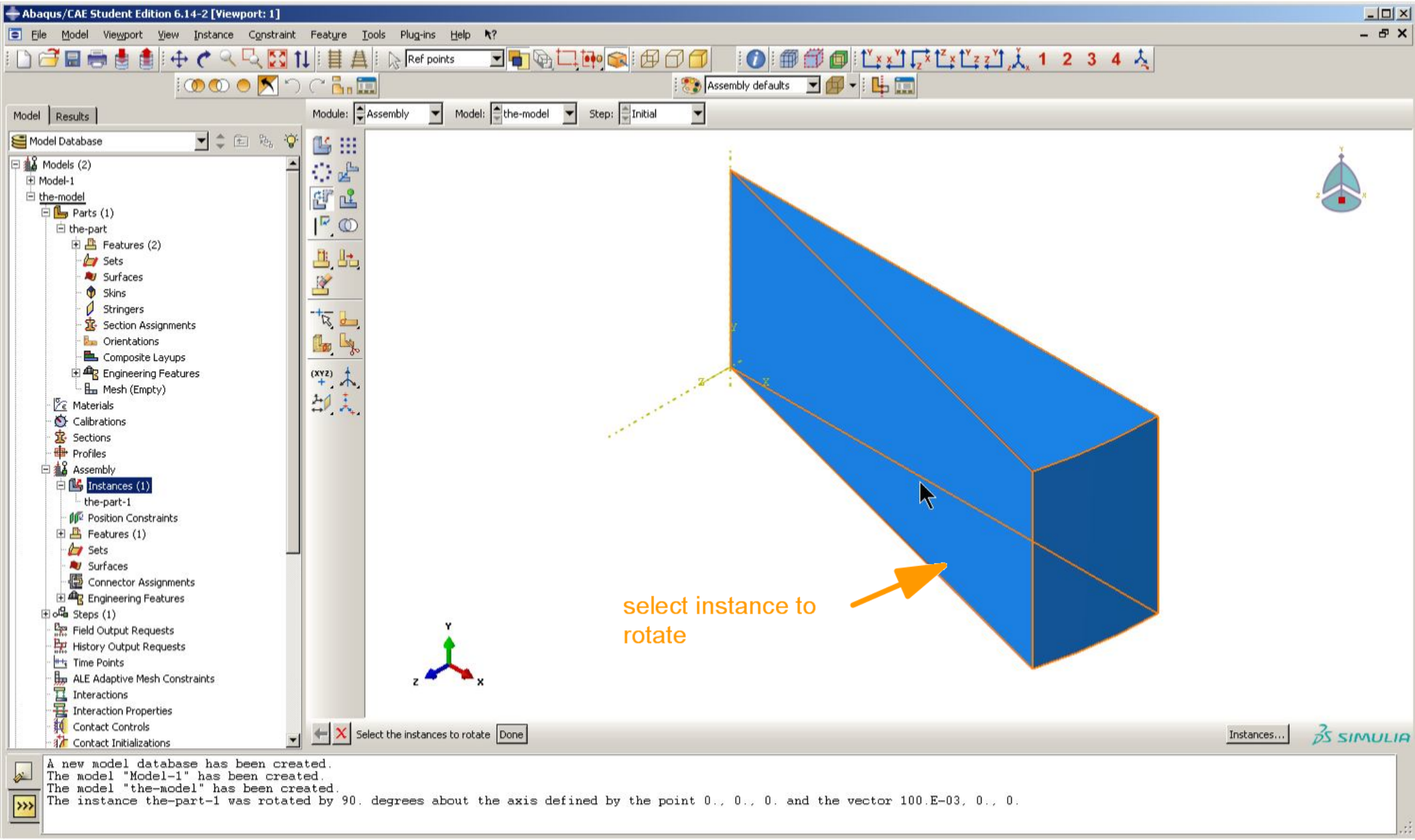

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Part Shape Feature Tools Plug-ins Help
Model Results
Model Database
Models (2)
Model-1
the-model
Parts (1)
Materials
Calibrations
Sections
Profiles
Assembly
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Contact Stabilizations
Constraints
Connector Sections
Fields
Amplitudes
Loads
BCs
Predefined Fields
Remeshing Rules
Optimization Tasks
Sketches
Annotations
Analysis
Jobs
Adaptivity Processes
Co-executions
Optimization Processes
Module: Part
Model: the-model
Part: the-part
Part defaults
we are going to place "datum":
an axis parallel to the Z direction
(as a reminder really, it is not
going to be used)
Principal axis choice: X-Axis Y-Axis Z-Axis
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.

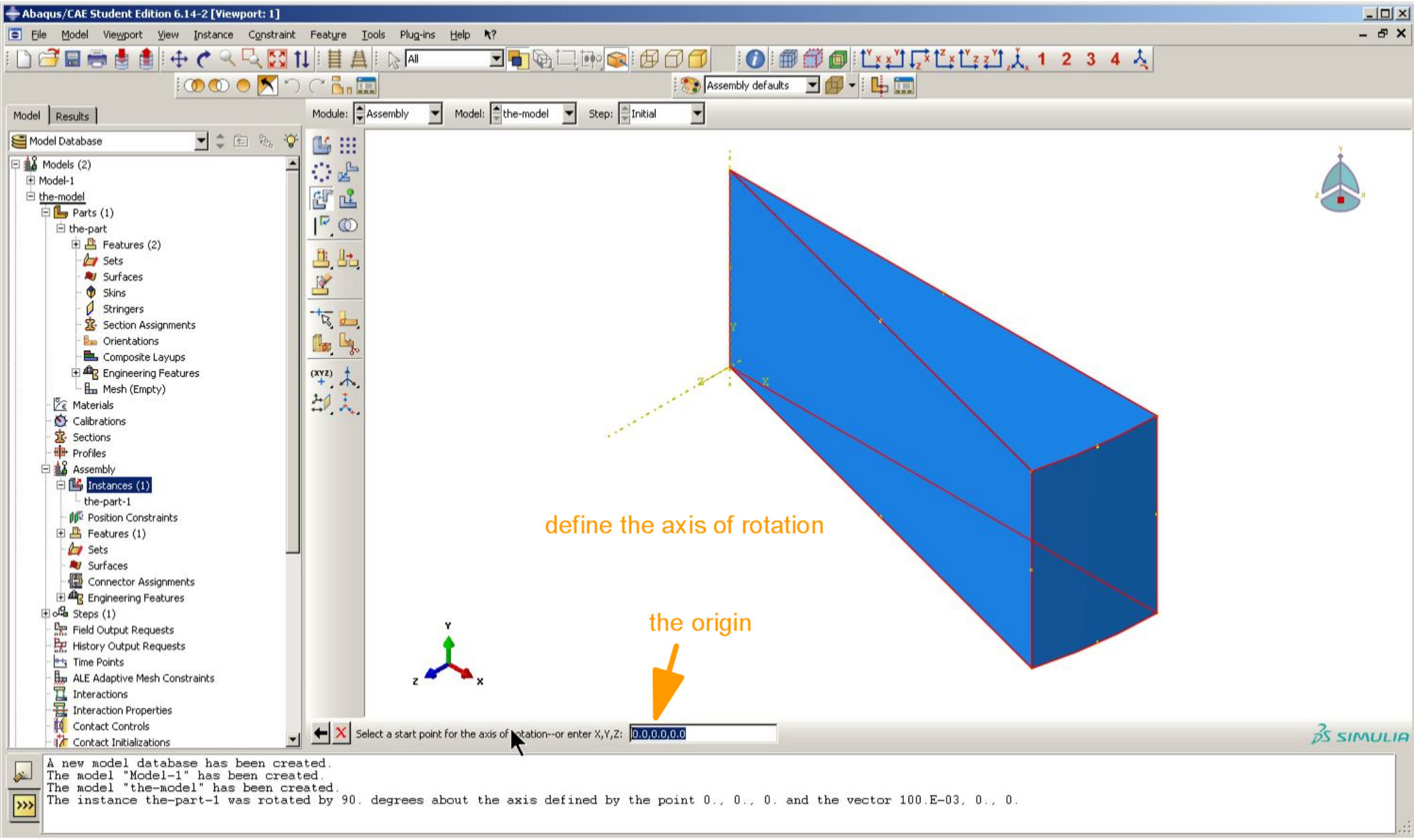

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Part Shape Feature Tools Plug-ins Help
Model Results
Module: Part Model: the-model Part: the-part
Model Database
Models (2)
Model-1
the-model
Parts (1)
Materials
Calibrations
Sections
Profiles
Assembly
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Contact Stabilizations
Constraints
Connector Sections
Fields
Amplitudes
Loads
BCs
Predefined Fields
Remeshing Rules
Optimization Tasks
Sketches
Annotations
Analysis
Jobs
Adaptivity Processes
Co-executions
Optimization Processes
Part defaults
Principal axis choice: X-Axis Y-Axis Z-Axis
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.

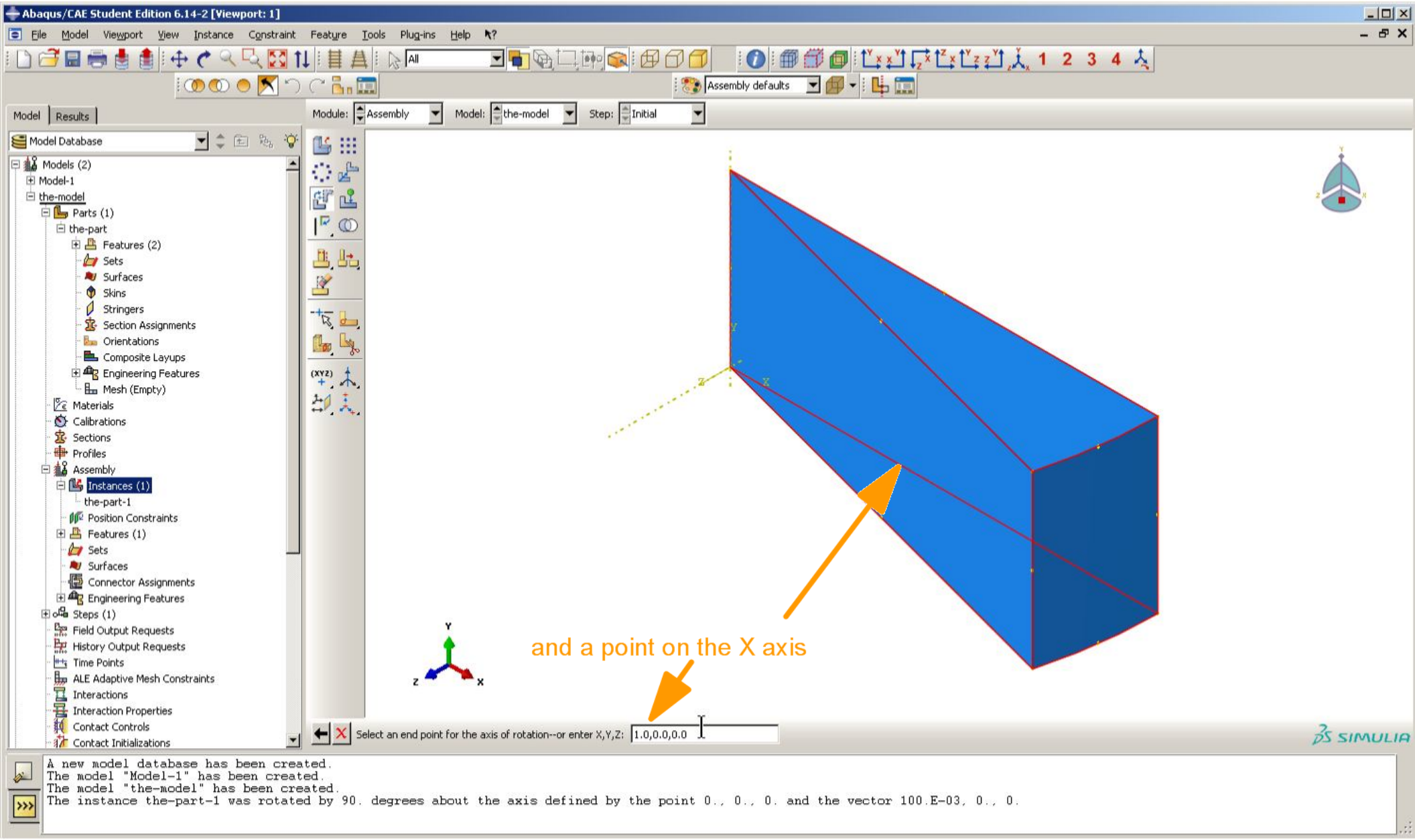

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Part Shape Feature Tools Plug-ins Help
Model Results
Module: Part Model: the-model Part: the-part
Model Database
Models (2)
Model-1
the-model
Parts (1)
Materials
Calibrations
Sections
Profiles
Assembly
Switch Context Ctrl+Space
Create...
Regenerate
Options...
Filter... F2
Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Contact Stabilizations
Constraints
Connector Sections
Fields
Amplitudes
Loads
BCs
Predefined Fields
Remeshing Rules
Optimization Tasks
Sketches
Annotations
Part defaults
now we are going to create an instance of the part, and the instance is going to be reoriented so that the vertical edge aligns with the Z direction
Y
Z
X
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.

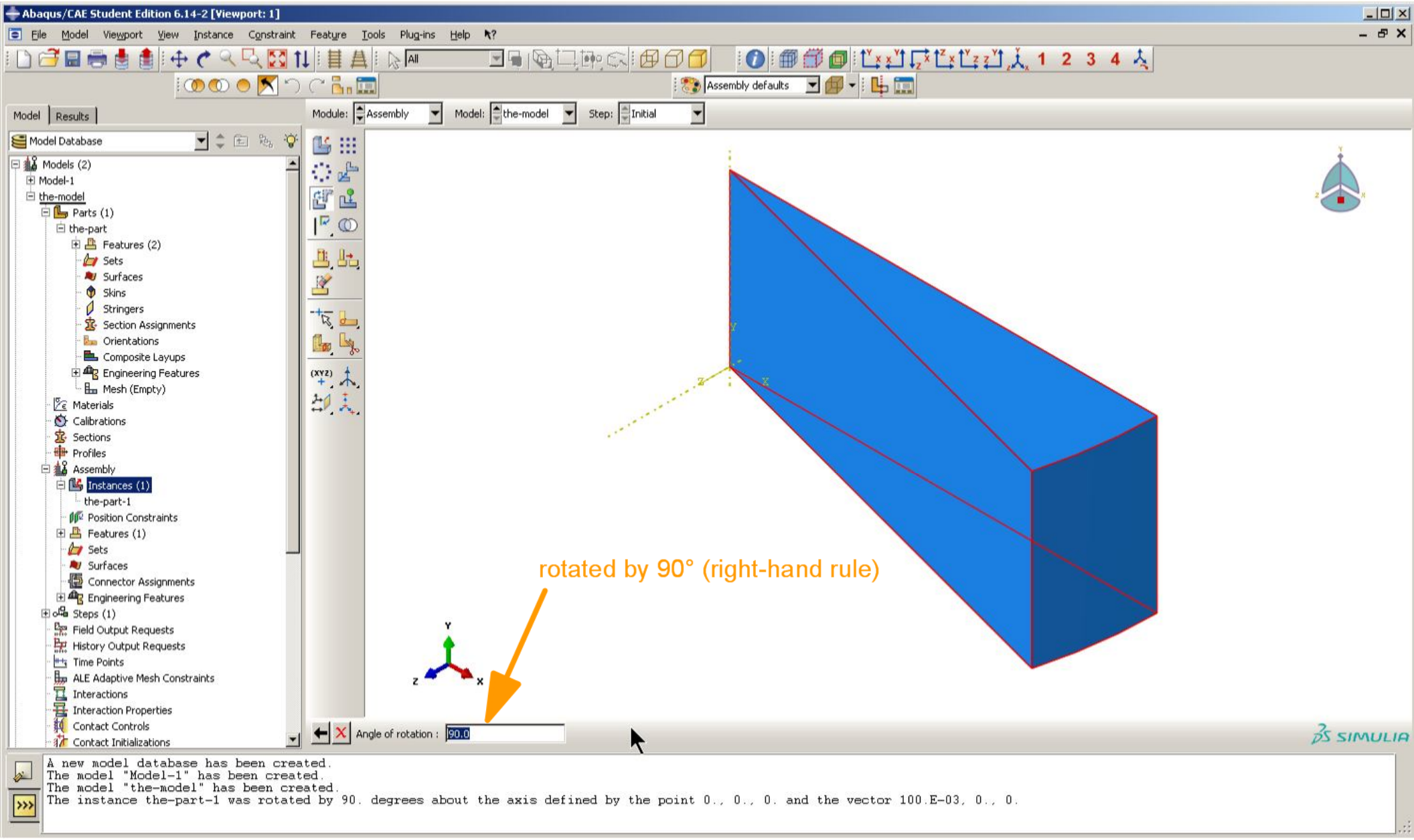

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Instance Constraint Feature Tools Plug-ins Help
Assembly defaults
Model Results
Module: Assembly Model: the-model Step: Initial
Model Database
Models (2)
Model-1
the-model
Parts (1)
Materials
Calibrations
Create Instance
Create instances from:
Parts Models
Parts
the-part
Instance Type
Dependent (mesh on part)
Independent (mesh on instance)
Note: To change a Dependent instance's mesh, you must edit its part's mesh.
Auto-offset from other instances
OK Apply Cancel
Connector Sections
Fields
Amplitudes
Loads
BCs
Predefined Fields
Remeshing Rules
Optimization Tasks
Sketches
Annotations
select
Select the parts/models to instance from the dialog
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.

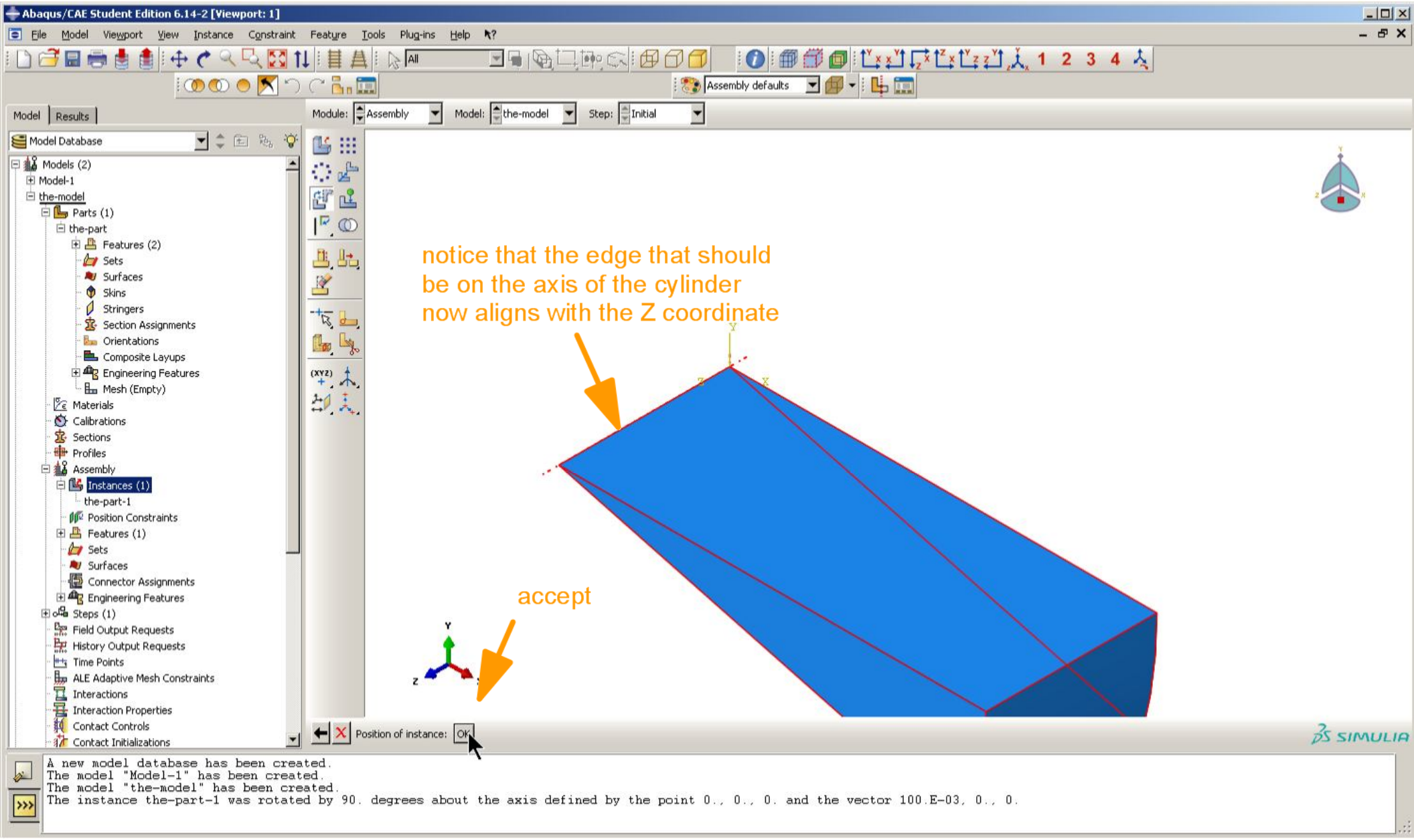

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Instance Constraint Feature Tools Plug-ins Help
Assembly defaults
Model Results
Module: Assembly Model: the-model Step: Initial
Model Database
Models (2)
Model-1
the-model
Parts (1)
Materials
Calibrations
Sections
Profiles
Assembly
Instances (1)
Position Constraints
Features (1)
Sets
Surfaces
Connector Assignments
Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Contact Stabilizations
Constraints
Connector Sections
Fields
Amplitudes
Loads
BCs
Predefined Fields
Remeshing Rules
Optimization Tasks
Sketches
Annotations
rotate instance
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.
SIMULIA

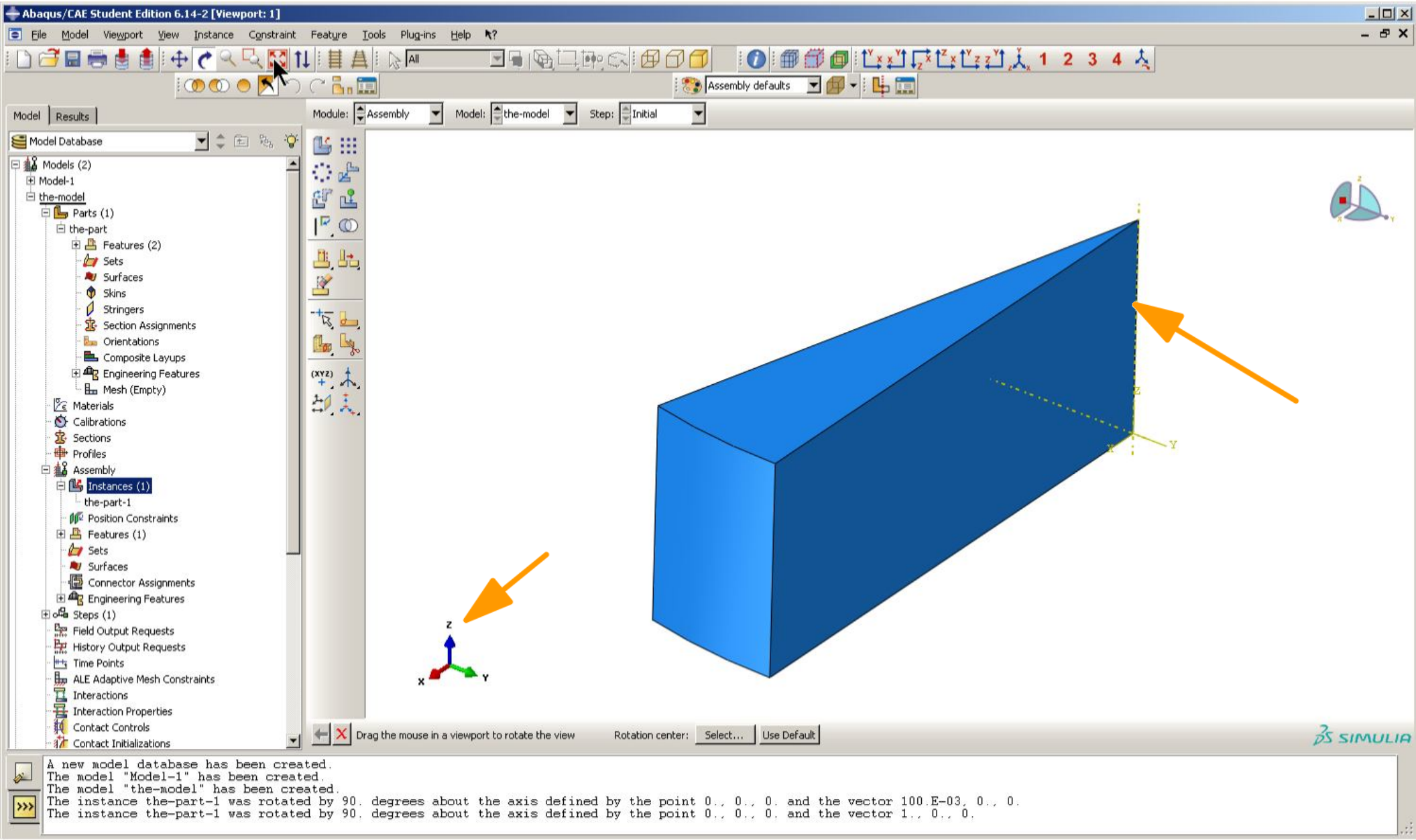

Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Instance Constraint Feature Tools Plug-ins Help
Ref points
Assembly defaults
Model Results
Module: Assembly
Model: the-model
Step: Initial
Model Database
Models (2)
Model-1
the-model
Parts (1)
the-part
Features (2)
Sets
Surfaces
Skins
Stringers
Section Assignments
Orientations
Composite Layups
Engineering Features
Mesh (Empty)
Materials
Calibrations
Sections
Profiles
Assembly
Instances (1)
the-part-1
Position Constraints
Features (1)
Sets
Surfaces
Connector Assignments
Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
select instance to rotate
Select the instances to rotate
Done
Instances...
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.
The instance the-part-1 was rotated by 90. degrees about the axis defined by the point 0., 0., 0. and the vector 100.E-03, 0., 0.


Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Instance Constraint Feature Tools Plug-ins Help
Model Results
Module: Assembly Model: the-model Step: Initial
Model Database
Models (2)
Model-1
the-model
Parts (1)
the-part
Features (2)
Sets
Surfaces
Skins
Stringers
Section Assignments
Orientations
Composite Layups
Engineering Features
Mesh (Empty)
Materials
Calibrations
Sections
Profiles
Assembly
Instances (1)
the-part-1
Position Constraints
Features (1)
Sets
Surfaces
Connector Assignments
Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
define the axis of rotation
the origin
Select a start point for the axis of rotation--or enter X,Y,Z:
0.0,0.0,0.0
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.
The instance the-part-1 was rotated by 90. degrees about the axis defined by the point 0., 0., 0. and the vector 100.E-03, 0., 0.


Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Instance Constraint Feature Tools Plug-ins Help
Model Results
Module: Assembly Model: the-model Step: Initial
Model Database
Models (2)
Model-1
the-model
Parts (1)
the-part
Features (2)
Sets
Surfaces
Skins
Stringers
Section Assignments
Orientations
Composite Layups
Engineering Features
Mesh (Empty)
Materials
Calibrations
Sections
Profiles
Assembly
Instances (1)
the-part-1
Position Constraints
Features (1)
Sets
Surfaces
Connector Assignments
Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
and a point on the X axis
Select an end point for the axis of rotation--or enter X,Y,Z:
1.0,0.0,0.0
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.
The instance the-part-1 was rotated by 90. degrees about the axis defined by the point 0., 0., 0. and the vector 100.E-03, 0., 0.


Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Instance Constraint Feature Tools Plug-ins Help
Model Results
Module: Assembly Model: the-model Step: Initial
Model Database
Models (2)
Model-1
the-model
Parts (1)
the-part
Features (2)
Sets
Surfaces
Skins
Stringers
Section Assignments
Orientations
Composite Layups
Engineering Features
Mesh (Empty)
Materials
Calibrations
Sections
Profiles
Assembly
Instances (1)
the-part-1
Position Constraints
Features (1)
Sets
Surfaces
Connector Assignments
Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
rotated by 90° (right-hand rule)
Angle of rotation : 90.0
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.
The instance the-part-1 was rotated by 90. degrees about the axis defined by the point 0., 0., 0. and the vector 100.E-03, 0., 0.


Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Instance Constraint Feature Tools Plug-ins Help
Assembly defaults
Model Results
Module: Assembly Model: the-model Step: Initial
Model Database
Models (2)
Model-1
the-model
Parts (1)
the-part
Features (2)
Sets
Surfaces
Skins
Stringers
Section Assignments
Orientations
Composite Layups
Engineering Features
Mesh (Empty)
Materials
Calibrations
Sections
Profiles
Assembly
Instances (1)
the-part-1
Position Constraints
Features (1)
Sets
Surfaces
Connector Assignments
Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
notice that the edge that should
be on the axis of the cylinder
now aligns with the Z coordinate
accept
Position of instance: OK
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
The model "the-model" has been created.
The instance the-part-1 was rotated by 90. degrees about the axis defined by the point 0., 0., 0. and the vector 100.E-03, 0., 0.


Abaqus/CAE Student Edition 6.14-2 [Viewport: 1]
File Model Viewport View Instance Constraint Feature Tools Plug-ins Help
Assembly defaults
Model Results
Module: Assembly Model: the-model Step: Initial
Model Database
Models (2)
Model-1
the-model
Parts (1)
the-part
Features (2)
Sets
Surfaces
Skins
Stringers
Section Assignments
Orientations
Composite Layups
Engineering Features
Mesh (Empty)
Materials
Calibrations
Sections
Profiles
Assembly
Instances (1)
the-part-1
Position Constraints
Features (1)
Sets
Surfaces
Connector Assignments
Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Drag the mouse in a viewport to rotate the view
Rotation center: Select... Use Default
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
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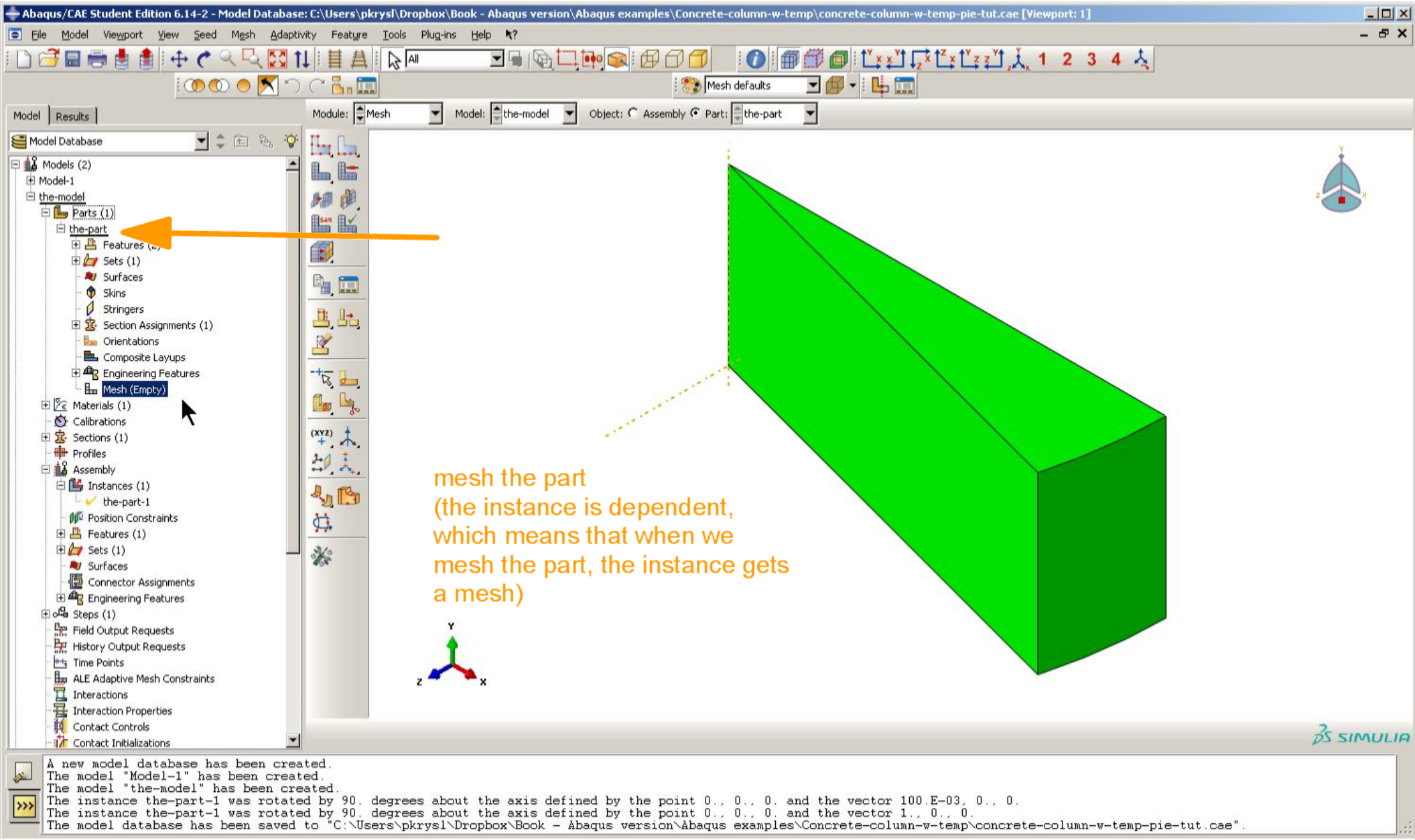
The instance the-part-1 was rotated by 90. degrees about the axis defined by the point 0., 0., 0. and the vector 1., 0., 0.


Abaqus/CAE Student Edition 6.14-2 - Model Database: C:\Users\pkrysl\Dropbox\Book - Abaqus version\Abaqus examples\Concrete-column-w-temp\concrete-column-w-temp-pie-tut.cae [Viewport: 1]
File Model Viewport View Seed Mesh Adaptivity Feature Tools Plug-ins Help
Mesh defaults
Model Results
Module: Mesh Model: the-model Object: Assembly Part: the-part
Model Database
Models (2)
Model-1
the-model
Parts (1)
the-part
Features (2)
Sets (1)
Surfaces
Skins
Stringers
Section Assignments (1)
Orientations
Composite Layups
Engineering Features
Mesh (Empty)
Materials (1)
Calibrations
Sections (1)
Profiles
Assembly
Instances (1)
the-part-1
Position Constraints
Features (1)
Sets (1)
Surfaces
Connector Assignments
Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
mesh the part
(the instance is dependent,
which means that when we
mesh the part, the instance gets
a mesh)
Y
Z
X
SIMULIA
A new model database has been created.
The model "Model-1" has been created.
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The instance the-part-1 was rotated by 90. degrees about the axis defined by the point 0., 0., 0. and the vector 100.E-03, 0., 0.
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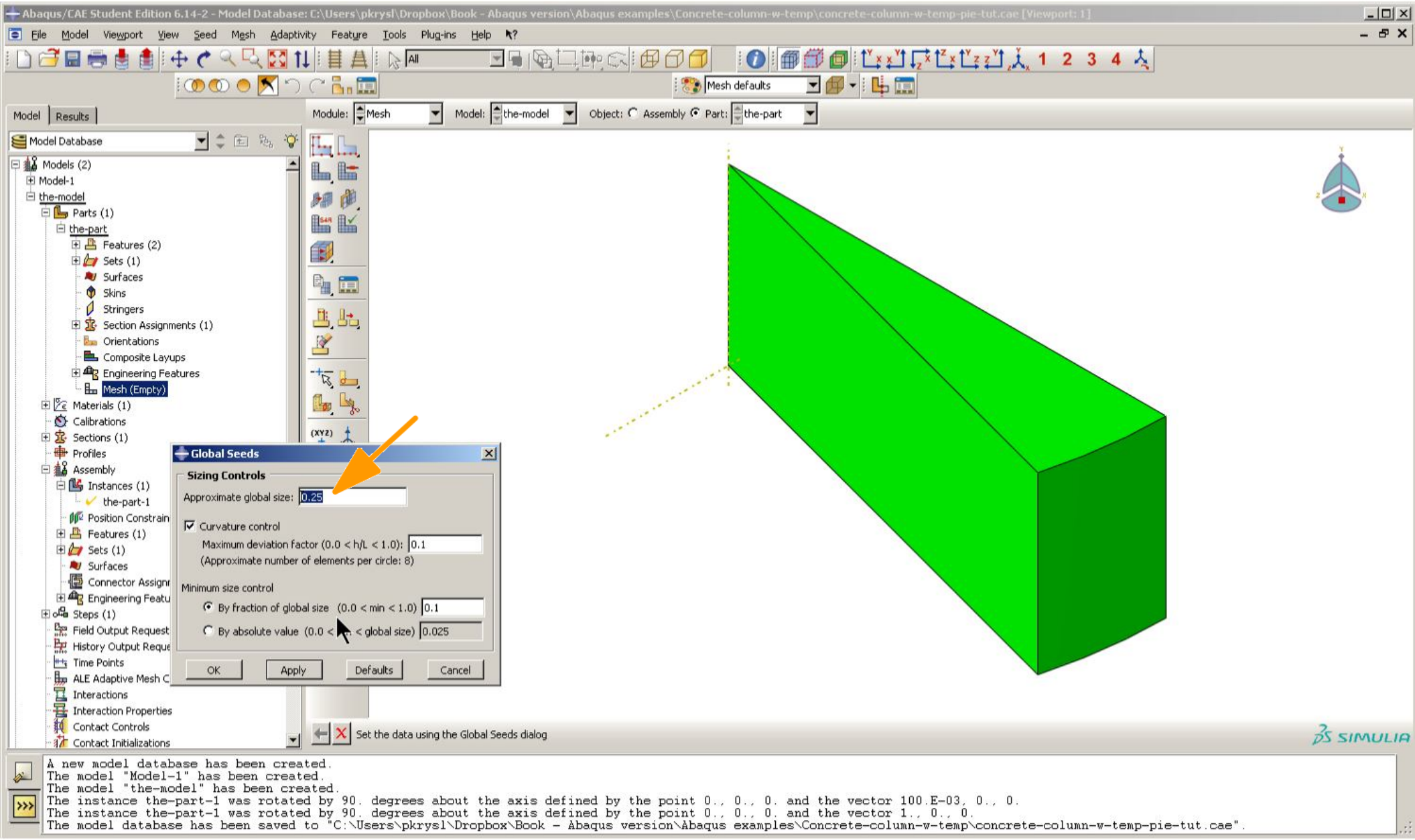
The model database has been saved to "C:\Users\pkrysl\Dropbox\Book - Abaqus version\Abaqus examples\Concrete-column-w-temp\concrete-column-w-temp-pie-tut.cae".


Abaqus/CAE Student Edition 6.14-2 - Model Database: C:\Users\pkrysl\Dropbox\Book - Abaqus version\Abaqus examples\Concrete-column-w-temp\concrete-column-w-temp-pie-tut.cae [Viewport: 1]
File Model Viewport View Seed Mesh Adaptivity Feature Tools Plug-ins Help
Mesh defaults
Model Results
Module: Mesh Model: the-model Object: Assembly Part: the-part
Model Database
Models (2)
Model-1
the-model
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the-part
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Surfaces
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Stringers
Section Assignments (1)
Orientations
Composite Layups
Engineering Features
Mesh (Empty)
Materials (1)
Calibrations
Sections (1)
Profiles
Assembly
Instances (1)
the-part-1
Position Constrain
Features (1)
Sets (1)
Surfaces
Connector Assignr
Engineering Featu
Steps (1)
Field Output Request
History Output Reque
Time Points
ALE Adaptive Mesh C
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Global Seeds
Sizing Controls
Approximate global size: 0.25
Curvature control
Maximum deviation factor (0.0 < h/L < 1.0): 0.1
(Approximate number of elements per circle: 8)
Minimum size control
By fraction of global size (0.0 < min < 1.0) 0.1
By absolute value (0.0 < < global size) 0.025
OK Apply Defaults Cancel
Set the data using the Global Seeds dialog
SIMULIA
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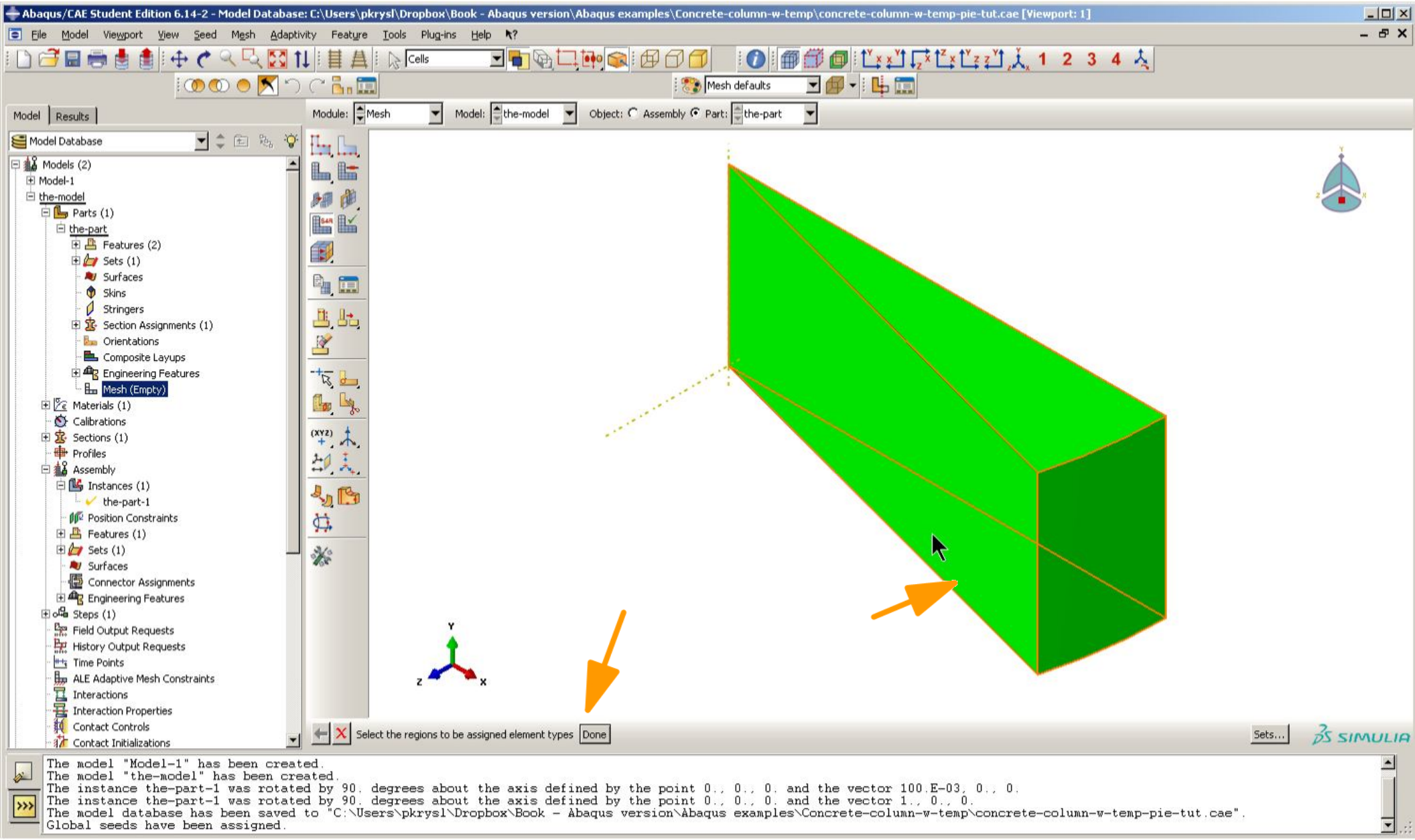
Abaqus/CAE Student Edition 6.14-2 - Model Database: C:\Users\pkrysl\Dropbox\Book - Abaqus version\Abaqus examples\Concrete-column-w-temp\concrete-column-w-temp-pie-tut.cae [Viewport: 1]
File Model Viewport View Seed Mesh Adaptivity Feature Tools Plug-ins Help
Cells
Mesh defaults
Model Results
Module: Mesh Model: the-model Object: Assembly Part: the-part
Model Database
Models (2)
Model-1
the-model
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Surfaces
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Orientations
Composite Layups
Engineering Features
Mesh (Empty)
Materials (1)
Calibrations
Sections (1)
Profiles
Assembly
Instances (1)
the-part-1
Position Constraints
Features (1)
Sets (1)
Surfaces
Connector Assignments
Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
Select the regions to be assigned element types
Done
Sets...
SIMULIA
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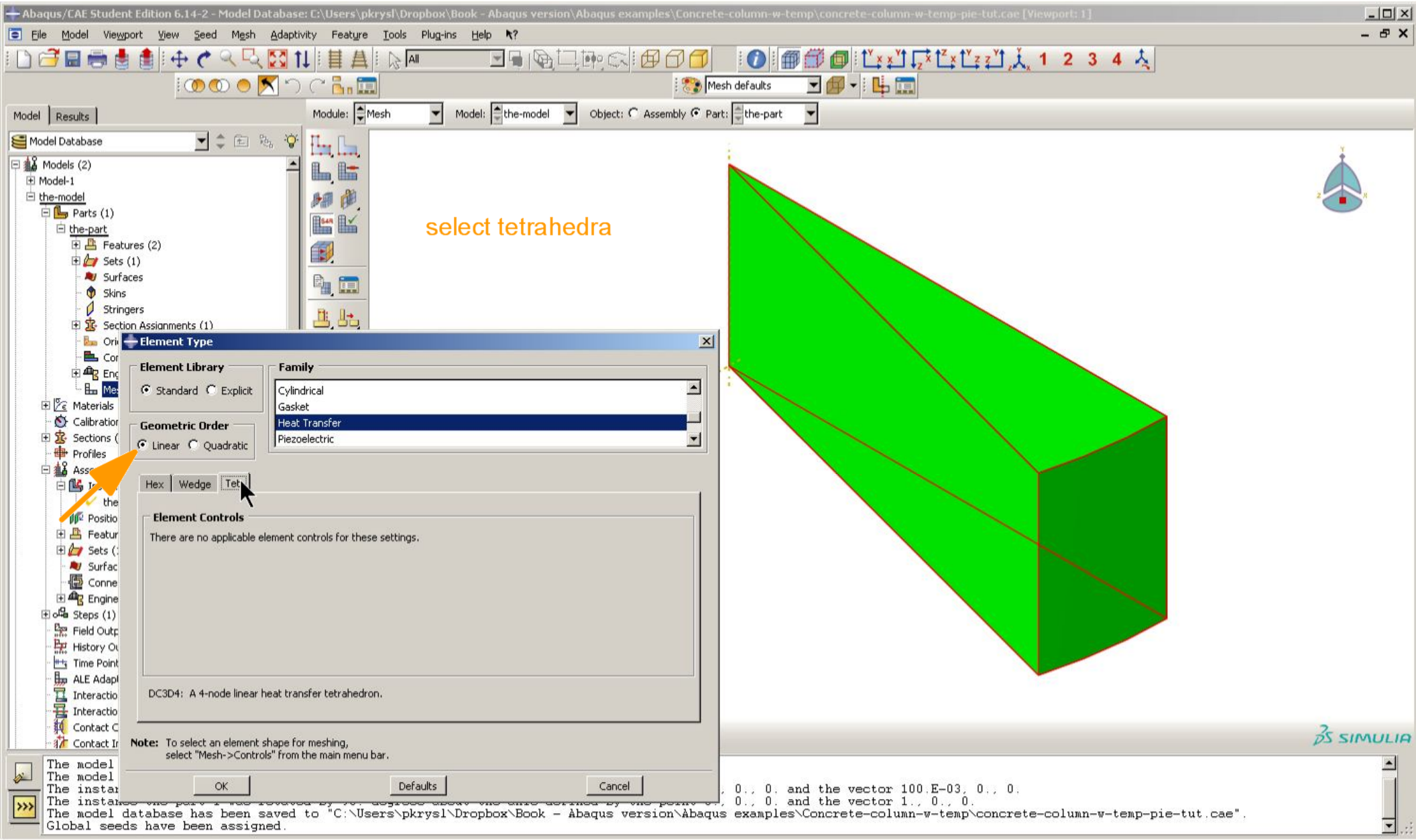
Global seeds have been assigned.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File Model Viewport View Seed Mesh Adaptivity Feature Tools Plug-ins Help
Mesh defaults
Model Results
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Model Database
Models (2)
Model-1
the-model
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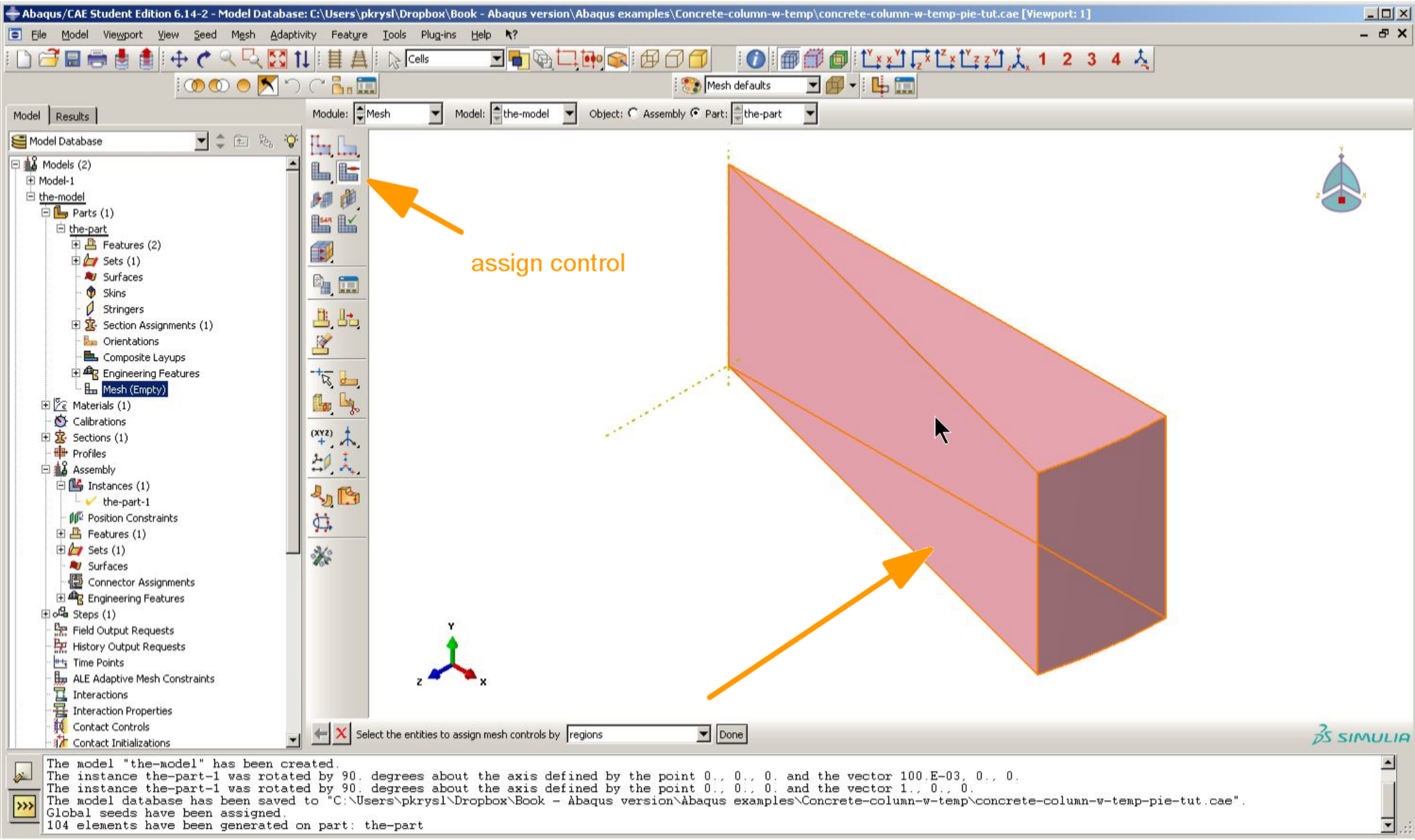
the-part
Features (2)
Sets (1)
Surfaces
Skins
Stringers
Section Assignments (1)
Materials
Profiles
Steps (1)
Element Type
Element Library
Standard Explicit
Family
Cylindrical
Gasket
Heat Transfer
Piezoelectric
Geometric Order
Linear Quadratic
Hex Wedge Tet
Element Controls
There are no applicable element controls for these settings.
DC3D4: A 4-node linear heat transfer tetrahedron.
Note: To select an element shape for meshing, select "Mesh->Controls" from the main menu bar.
OK Defaults Cancel
select tetrahedra
SIMULIA
The model database has been saved to "C:\Users\pkrysl\Dropbox\Book - Abaqus version\Abaqus examples\Concrete-column-w-temp\concrete-column-w-temp-pie-tut.cae".
Global seeds have been assigned.


Abaqus/CAE Student Edition 6.14-2 - Model Database: C:\Users\pkrysl\Dropbox\Book - Abaqus version\Abaqus examples\Concrete-column-w-temp\concrete-column-w-temp-pie-tut.cae [Viewport: 1]
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Mesh defaults
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Instances (1)
the-part-1
Position Constraints
Features (1)
Sets (1)
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Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
assign control
Select the entities to assign mesh controls by regions
Done
SIMULIA
The model "the-model" has been created.
The instance the-part-1 was rotated by 90. degrees about the axis defined by the point 0., 0., 0. and the vector 100.E-03, 0., 0.
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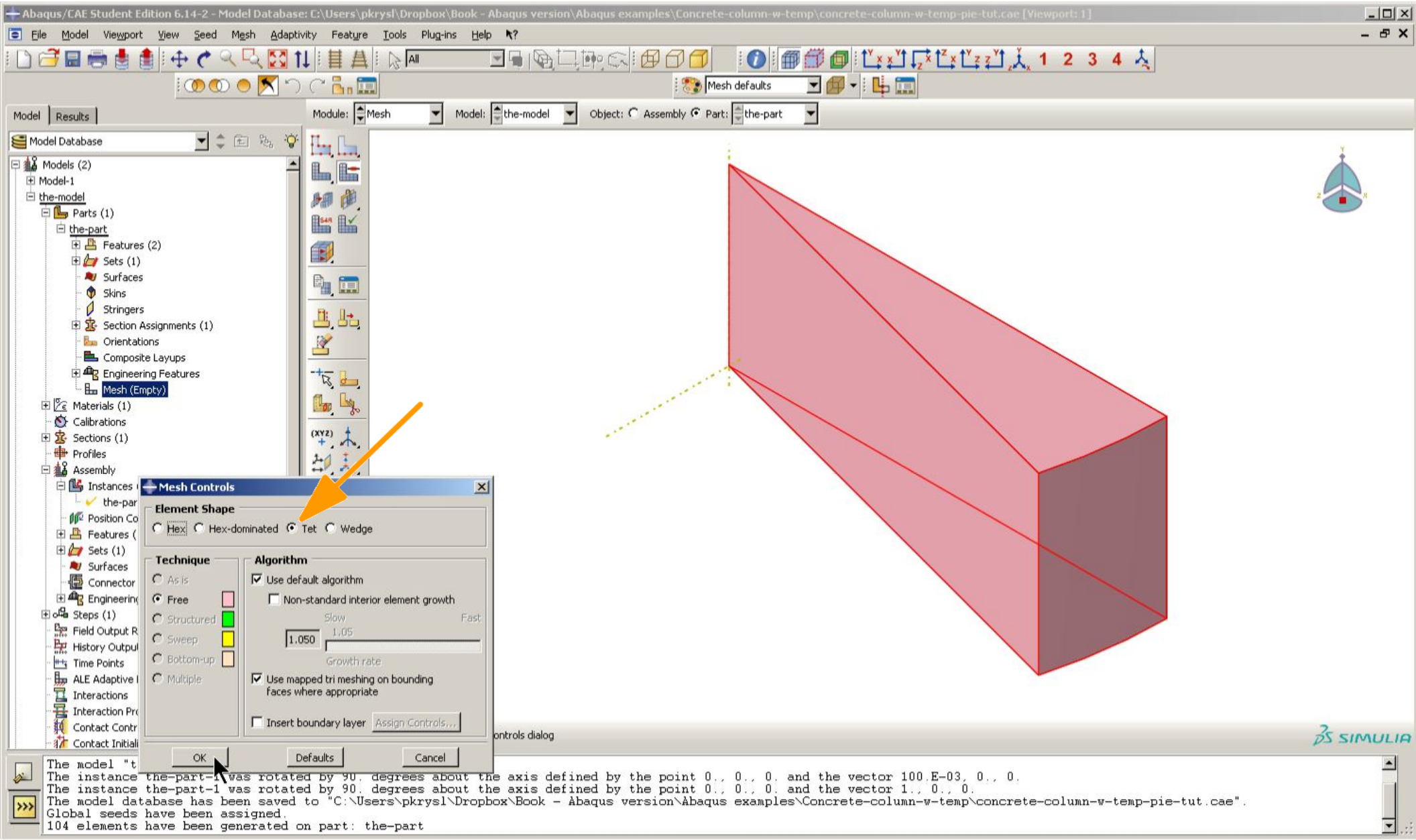
Global seeds have been assigned.
104 elements have been generated on part: the-part


Abaqus/CAE Student Edition 6.14-2 - Model Database: C:\Users\pkrysl\Dropbox\Book - Abaqus version\Abaqus examples\Concrete-column-w-temp\concrete-column-w-temp-pie-tut.cae [Viewport: 1]
File Model Viewport View Seed Mesh Adaptivity Feature Tools Plug-ins Help
Mesh defaults
Model Results
Module: Mesh Model: the-model Object: Assembly Part: the-part
Model Database
Models (2)
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the-part
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Surfaces
Skins
Stringers
Section Assignments (1)
Orientations
Composite Layups
Engineering Features
Mesh (Empty)
Materials (1)
Calibrations
Sections (1)
Profiles
Assembly
Mesh Controls
Element Shape
Hex Hex-dominated Tet Wedge
Technique
As is
Free
Structured
Sweep
Bottom-up
Multiple
Algorithm
Use default algorithm
Non-standard interior element growth
Slow Fast
1.050
1.05
Growth rate
Use mapped tri meshing on bounding faces where appropriate
Insert boundary layer
Assign Controls...
OK Defaults Cancel
SIMULIA
The model "t
The instance the-part-1 was rotated by 90. degrees about the axis defined by the point 0., 0., 0. and the vector 100.E-03, 0., 0.
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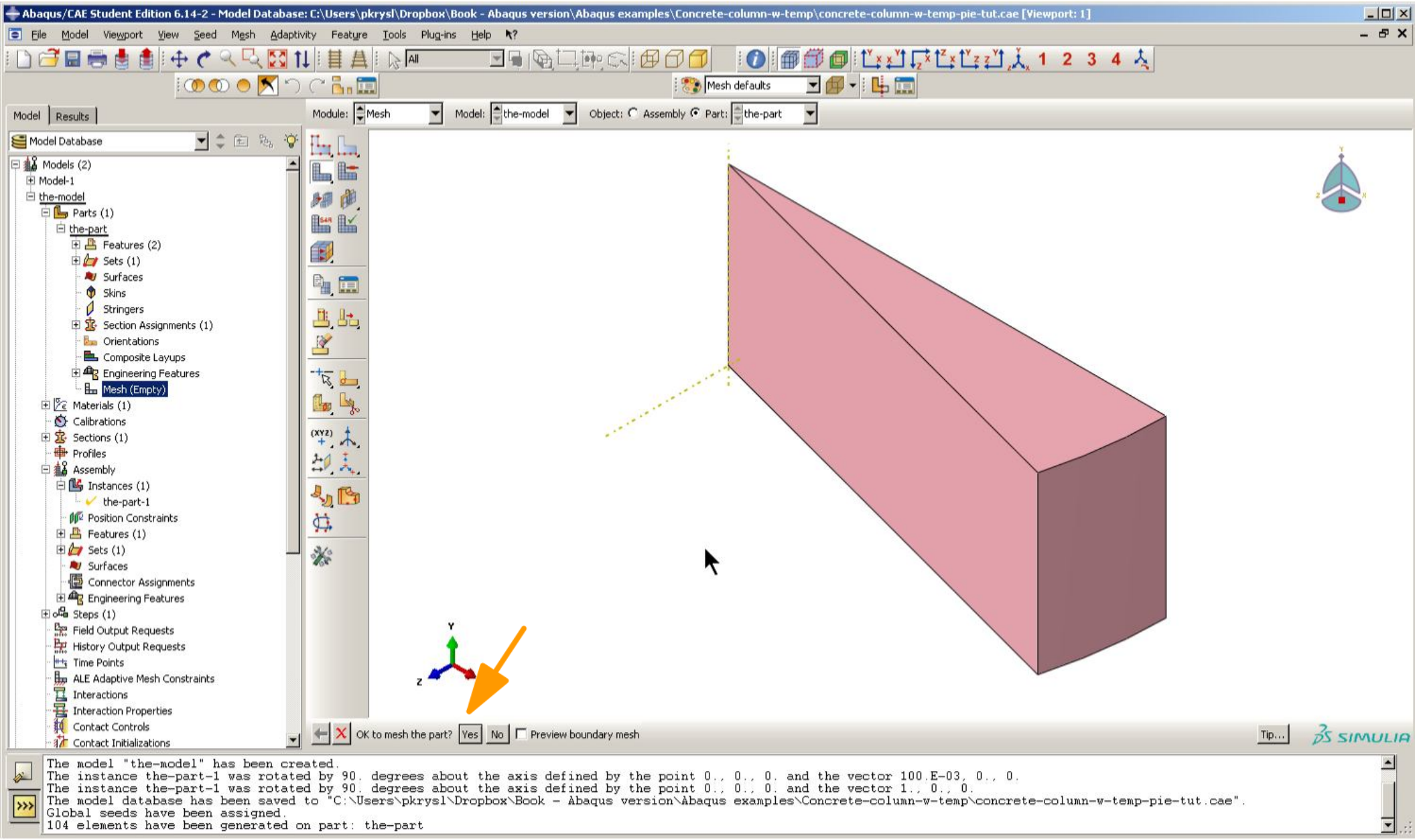
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File Model Viewport View Seed Mesh Adaptivity Feature Tools Plug-ins Help
Mesh defaults
Model Results
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Model Database
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Composite Layups
Engineering Features
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Sections (1)
Profiles
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Instances (1)
the-part-1
Position Constraints
Features (1)
Sets (1)
Surfaces
Connector Assignments
Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
OK to mesh the part? Yes No Preview boundary mesh
Tip...
SIMULIA
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The instance the-part-1 was rotated by 90. degrees about the axis defined by the point 0., 0., 0. and the vector 1., 0., 0.
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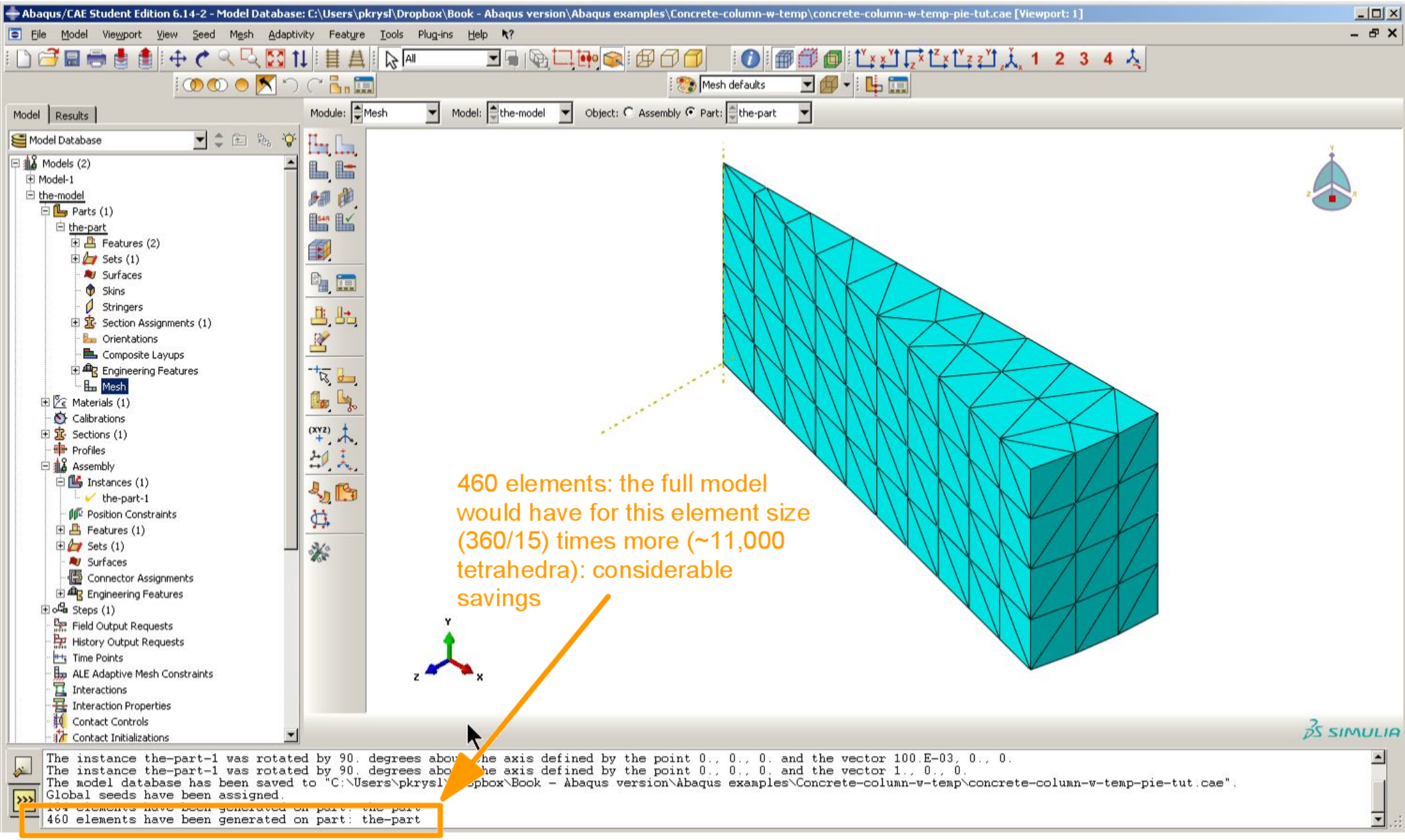
Abaqus/CAE Student Edition 6.14-2 - Model Database: C:\Users\pkrysl\Dropbox\Book - Abaqus version\Abaqus examples\Concrete-column-w-temp\concrete-column-w-temp-pie-tut.cae [Viewport: 1]
File Model Viewport View Seed Mesh Adaptivity Feature Tools Plug-ins Help
Mesh defaults
Model Results
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Materials (1)
Calibrations
Sections (1)
Profiles
Assembly
Instances (1)
the-part-1
Position Constraints
Features (1)
Sets (1)
Surfaces
Connector Assignments
Engineering Features
Steps (1)
Field Output Requests
History Output Requests
Time Points
ALE Adaptive Mesh Constraints
Interactions
Interaction Properties
Contact Controls
Contact Initializations
460 elements: the full model would have for this element size (360/15) times more (~11,000 tetrahedra): considerable savings
SIMULIA
The instance the-part-1 was rotated by 90. degrees about the axis defined by the point 0., 0., 0. and the vector 100.E-03, 0., 0.
The instance the-part-1 was rotated by 90. degrees about the axis defined by the point 0., 0., 0. and the vector 1., 0., 0.
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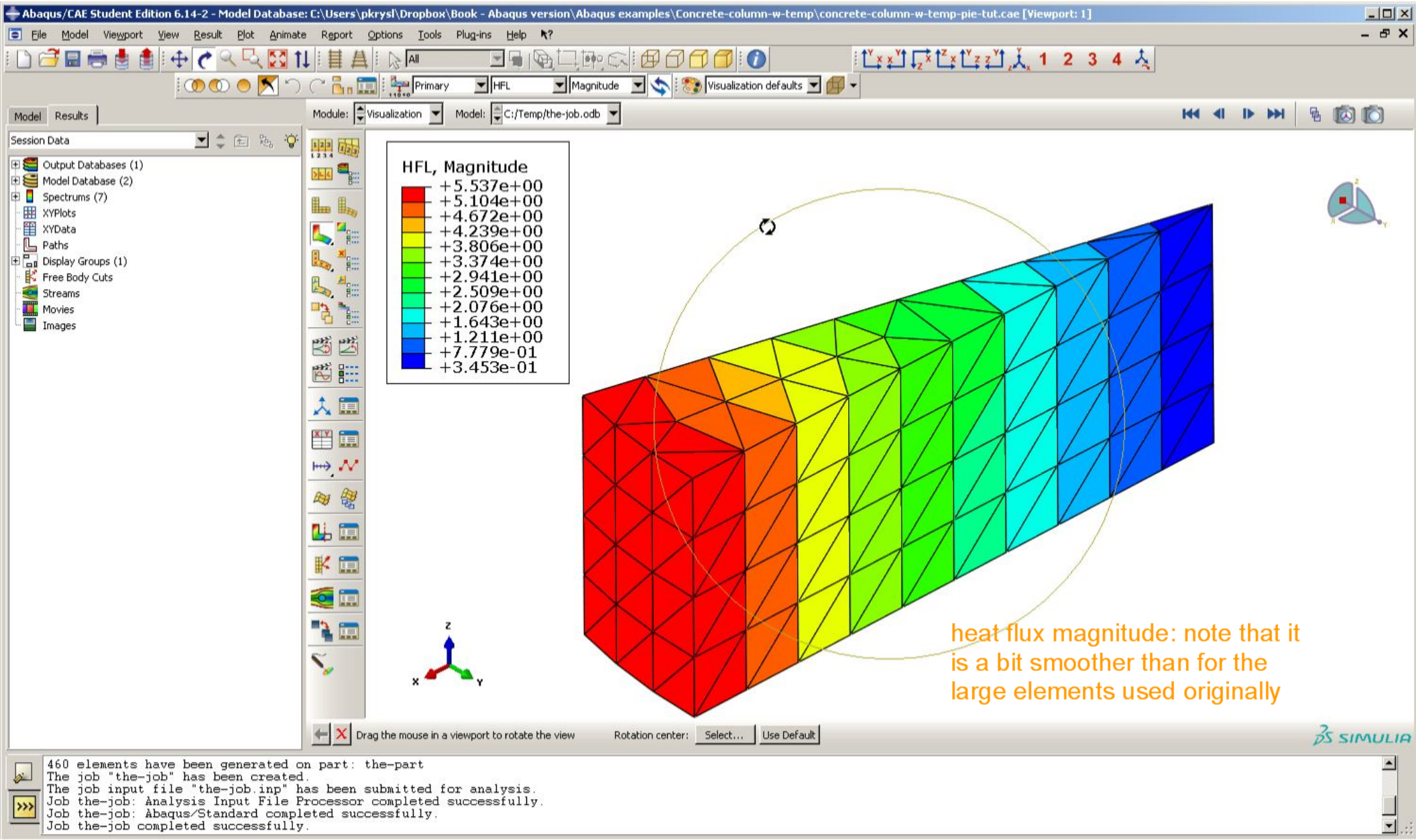
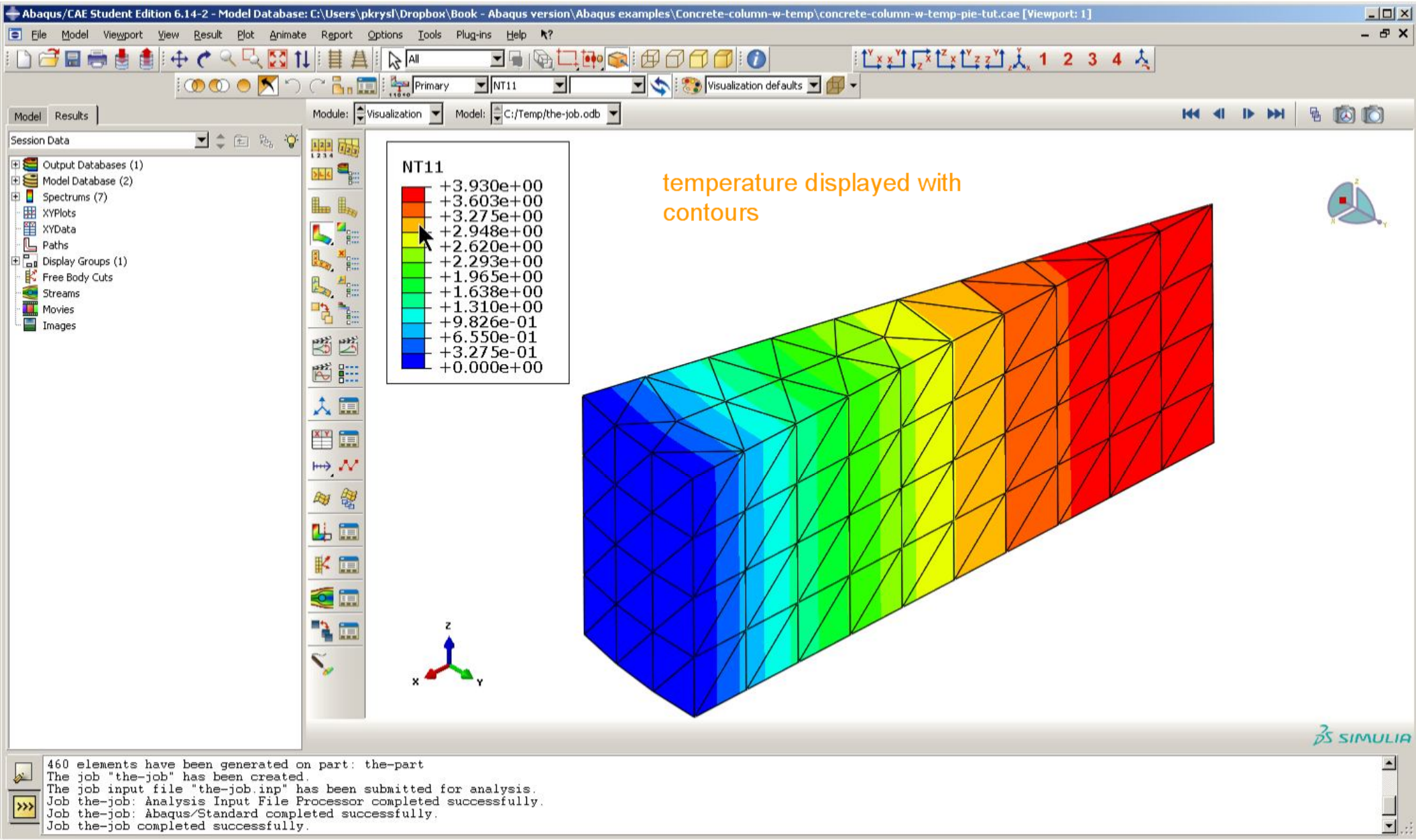
Global seeds have been assigned.
460 elements have been generated on part: the-part

Next we define material, section, assign the section, define the step, the load and the BC, and the job. We execute the job and plot the results.



heat flux magnitude: note that it is a bit smoother than for the large elements used originally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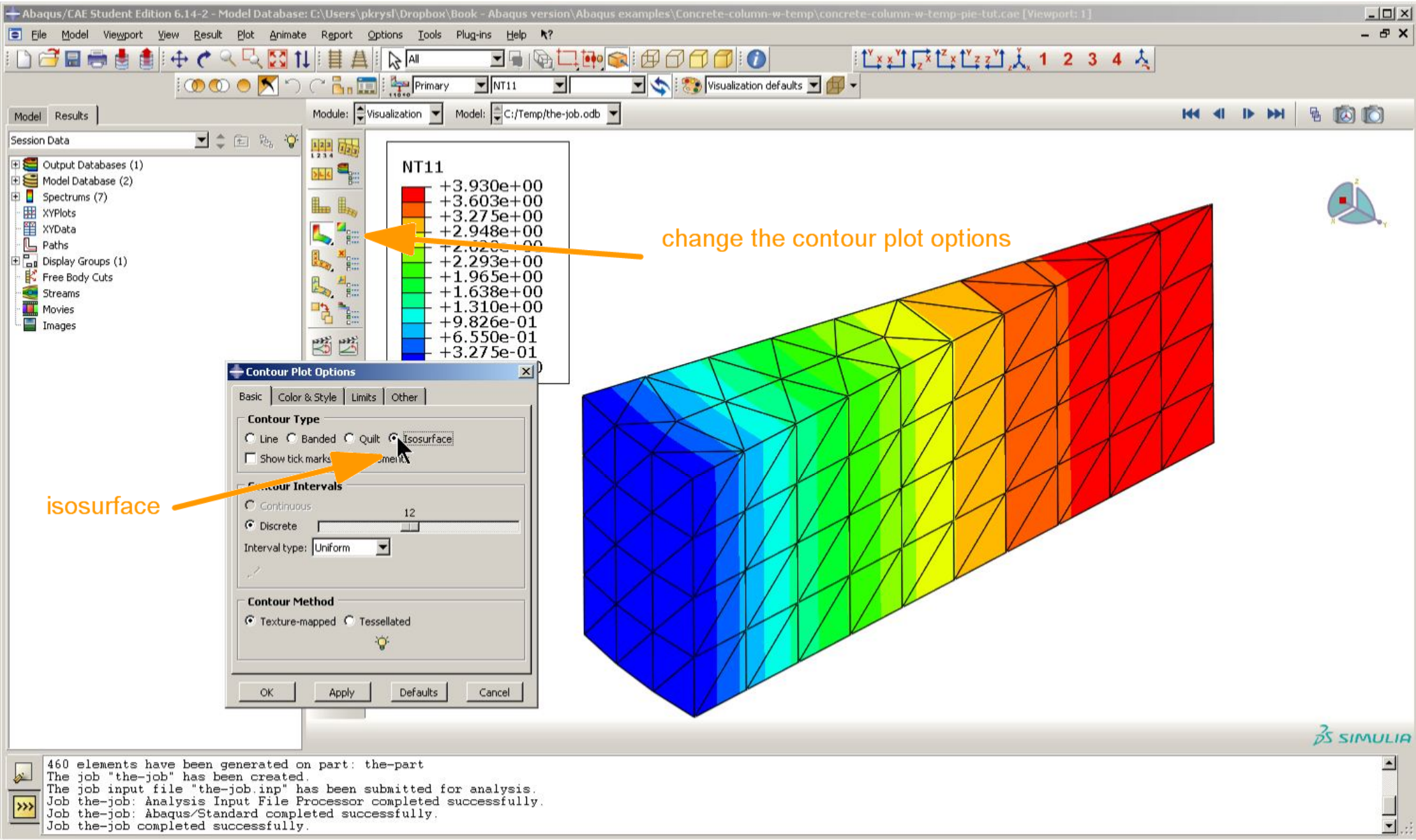
File Model Viewport View Result Plot Animate Report Options Tools Plug-ins Help
Model Results
Session Data
Output Databases (1)
Model Database (2)
Spectrums (7)
XYPlots
XYData
Paths
Display Groups (1)
Free Body Cuts
Streams
Movies
Images
Module: Visualization
Model: C:/Temp/the-job.odb
NT11
+3.930e+00
+3.603e+00
+3.275e+00
+2.948e+00
+2.620e+00
+2.293e+00
+1.965e+00
+1.638e+00
+1.310e+00
+9.826e-01
+6.550e-01
+3.275e-01
+0.000e+00
temperature displayed with contours
460 elements have been generated on part: the-part
The job "the-job" has been created.
The job input file "the-job.inp" has been submitted for analysis.
Job the-job: Analysis Input File Processor completed successfully.
Job the-job: Abaqus/Standard completed successfully.
Job the-job completed successfully.


Abaqus/CAE Student Edition 6.14-2 - Model Database: C:\Users\pkrysl\Dropbox\Book - Abaqus version\Abaqus examples\Concrete-column-w-temp\concrete-column-w-temp-pie-tut.cae [Viewport: 1]
File Model Viewport View Result Plot Animate Report Options Tools Plug-ins Help
Model Results
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XYPlots
XYData
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Movies
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Module: Visualization
Model: C:/Temp/the-job.odb
NT11
+3.930e+00
+3.603e+00
+3.275e+00
+2.948e+00
+2.293e+00
+1.965e+00
+1.638e+00
+1.310e+00
+9.826e-01
+6.550e-01
+3.275e-01
change the contour plot options
isosurface
Contour Plot Options
Basic
Color & Style
Limits
Other
Contour Type
Line
Banded
Quilt
Isosurface
Show tick marks
Contour Intervals
Continuous
Discrete
12
Interval type:
Uniform
Contour Method
Texture-mapped
Tessellated
OK
Apply
Defaults
Cancel
SIMULIA
460 elements have been generated on part: the-part
The job "the-job" has been created.
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Job the-job: Analysis Input File Processor completed successfully.
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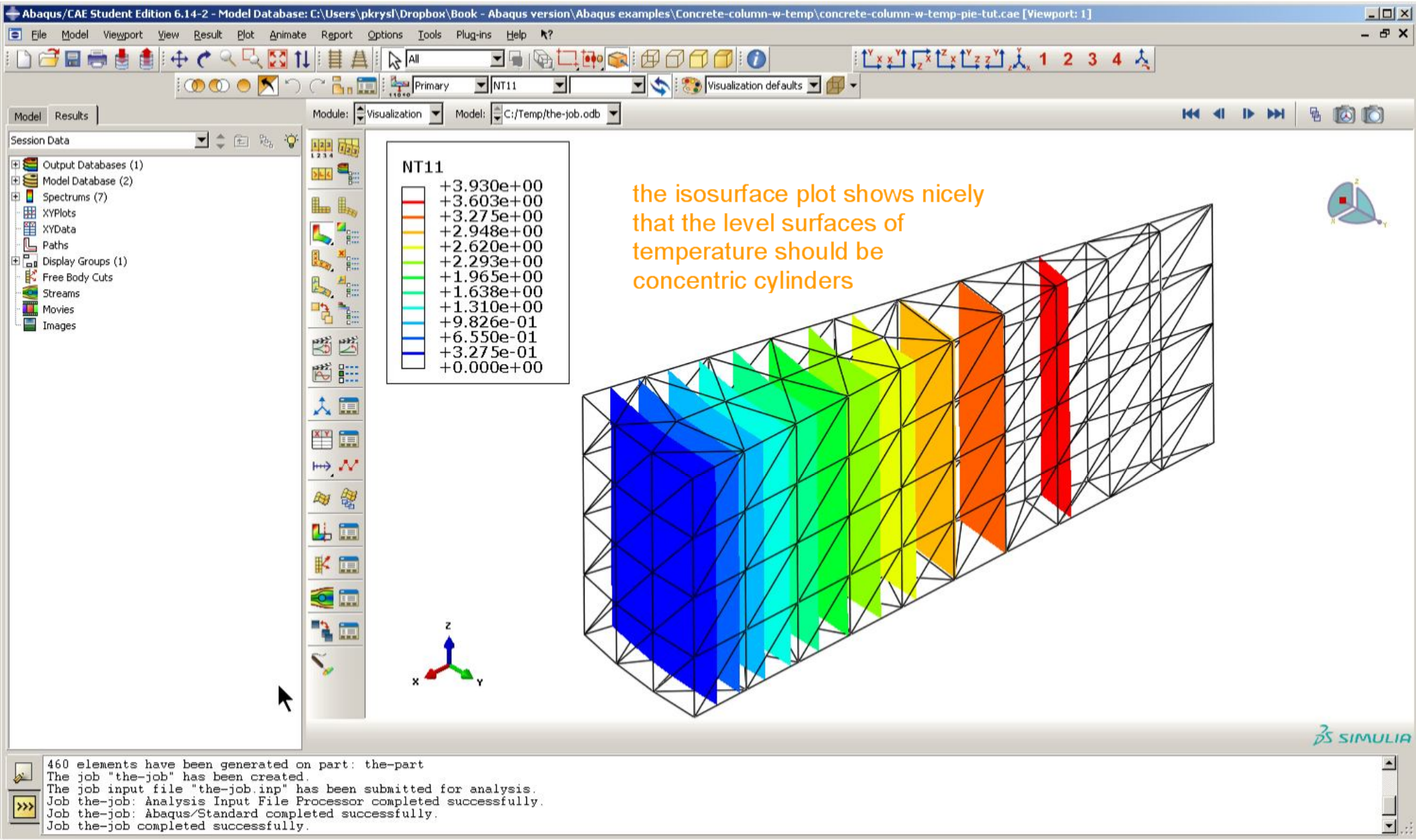
Abaqus/CAE Student Edition 6.14-2 - Model Database: C:\Users\pkrysl\Dropbox\Book - Abaqus version\Abaqus examples\Concrete-column-w-temp\concrete-column-w-temp-pie-tut.cae [Viewport: 1]
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NT11
+3.930e+00
+3.603e+00
+3.275e+00
+2.948e+00
+2.620e+00
+2.293e+00
+1.965e+00
+1.638e+00
+1.310e+00
+9.826e-01
+6.550e-01
+3.275e-01
+0.000e+00
the isosurface plot shows nicely that the level surfaces of temperature should be concentric cylinders
SIMULIA
460 elements have been generated on part: the-part
The job "the-job" has been created.
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Job the-job: Analysis Input File Processor completed successfully.
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