

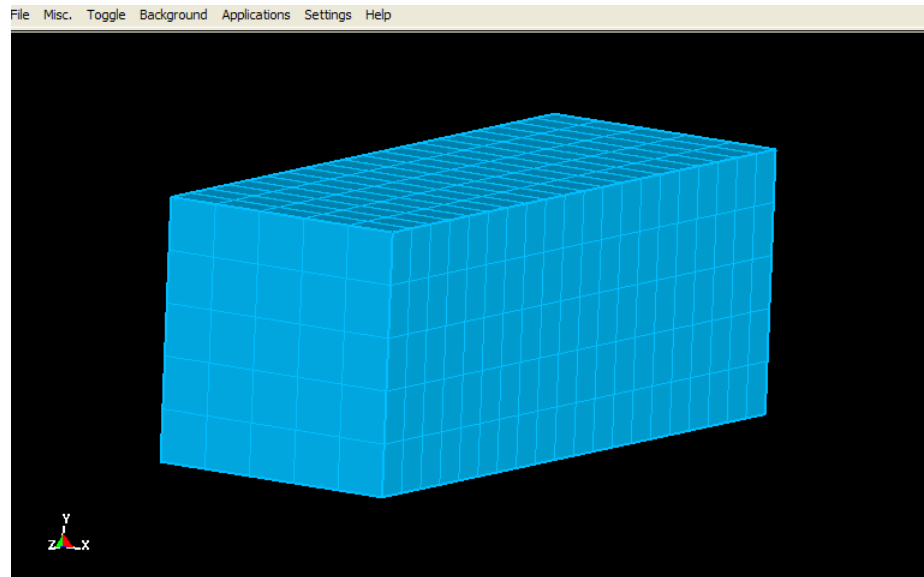
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Examples

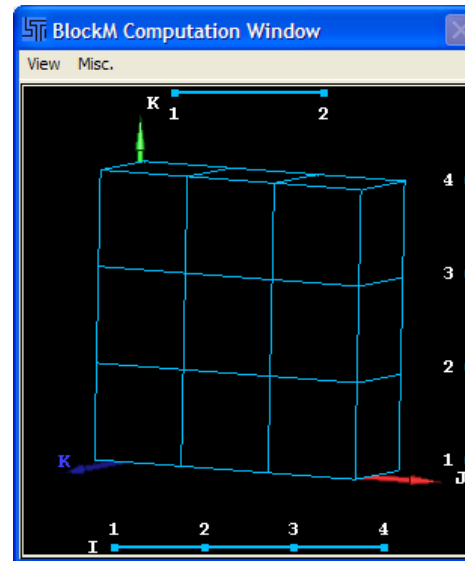
# BlockM: Multiple Examples

## □ Solid Cylindrical Rod

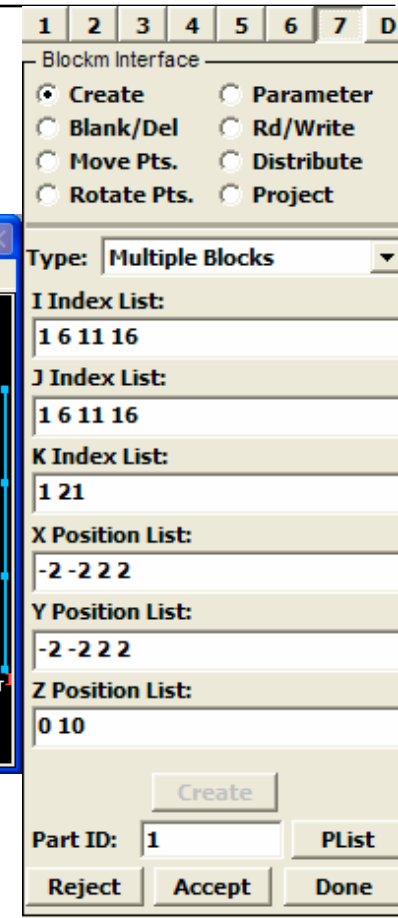
- To the right is how we setup and initialize the block for a cylindrical rod.
- Below is how the block appears in the **Main** and **Computation** windows.



Main Window



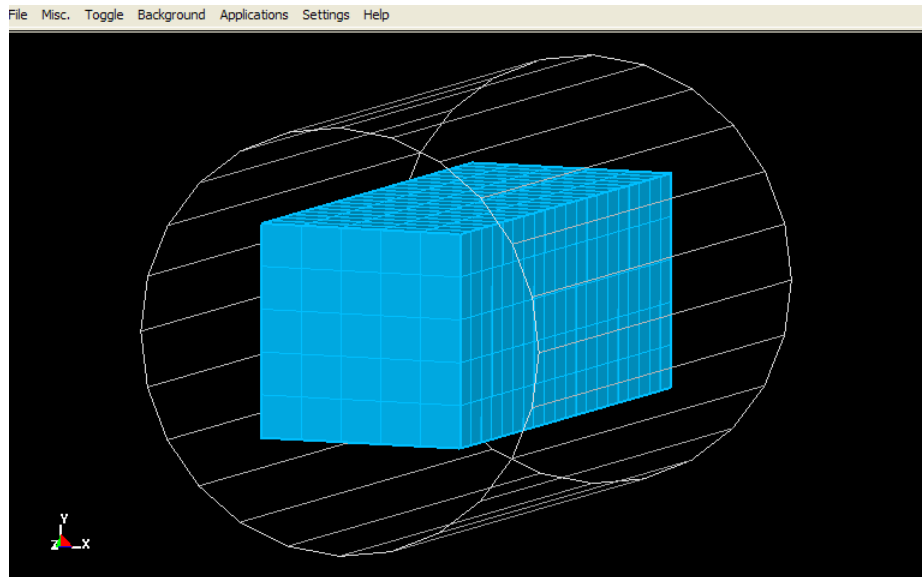
Computation Window

A screenshot of the 'Blockm Interface' control panel. It features a menu bar with options 1, 2, 3, 4, 5, 6, 7, and D. Below the menu bar, there are several radio button options: 'Create' (selected), 'Blank/Del', 'Move Pts.', 'Rotate Pts.', 'Parameter', 'Rd/Write', 'Distribute', and 'Project'. A dropdown menu is set to 'Multiple Blocks'. Below this, there are several lists: 'I Index List' (1 6 11 16), 'J Index List' (1 6 11 16), 'K Index List' (1 21), 'X Position List' (-2 -2 2 2), 'Y Position List' (-2 -2 2 2), and 'Z Position List' (0 10). At the bottom, there are buttons for 'Create', 'Part ID: 1', 'PList', 'Reject', 'Accept', and 'Done'.

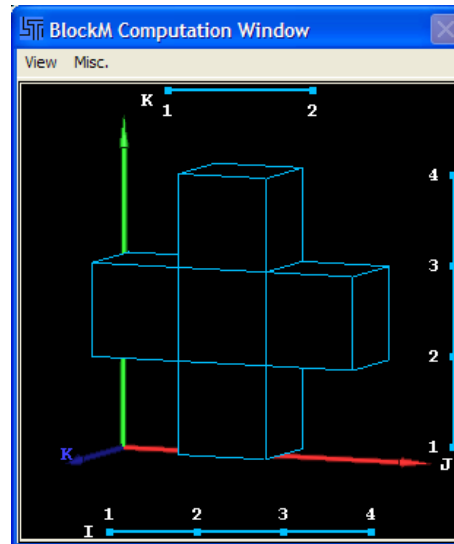
# BlockM: Multiple Examples

## □ Solid Cylindrical Rod

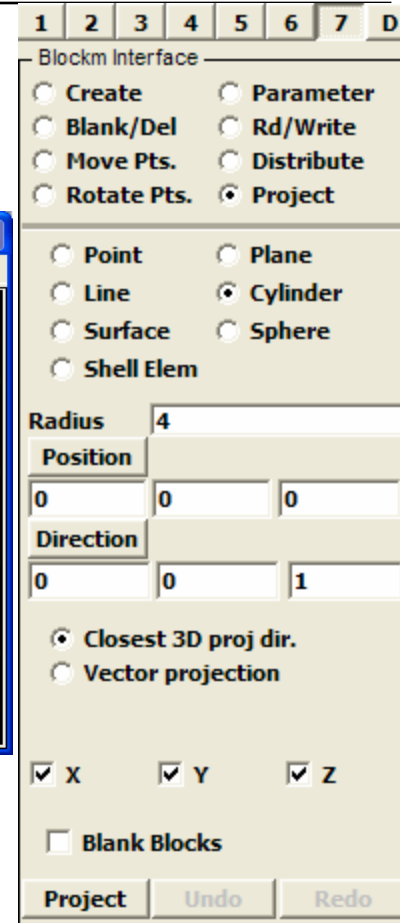
- Next, we delete the 4 regions in the block. This is only noticeable in the Computation window below.
- Then, we setup a cylinder with a radius of 4, along the Z axis for projection.



Main Window



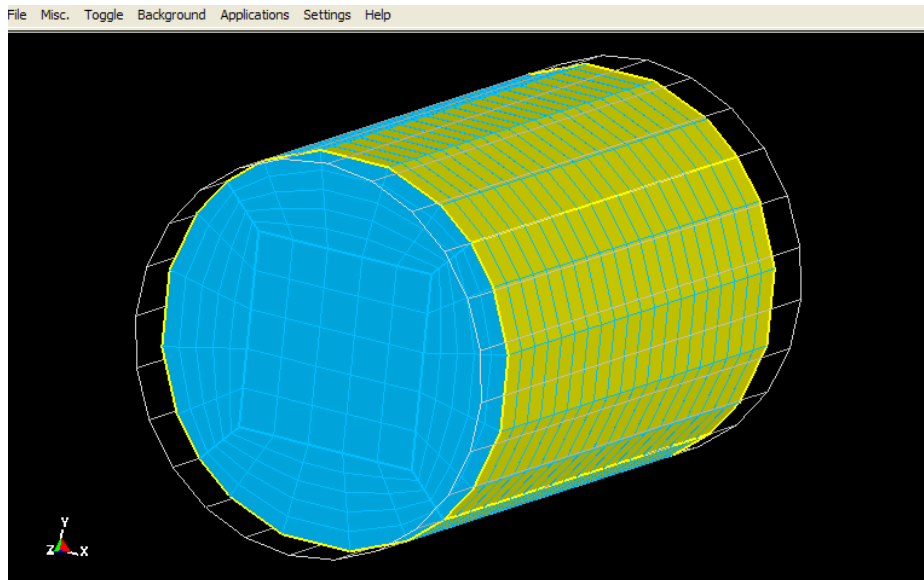
Computation Window



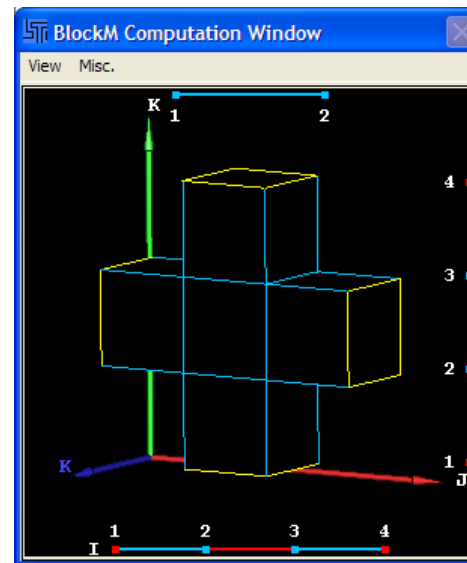
# BlockM: Multiple Examples

## □ Solid Cylindrical Rod

- Finally, we select all the outside faces in the I and J index directions and project.
- The selected faces are highlighted in yellow, as seen below.



Main Window



Computation Window

1	2	3	4	5	6	7	D
Blockm Interface							
<input type="radio"/> Create				<input type="radio"/> Parameter			
<input type="radio"/> Blank/Del				<input type="radio"/> Rd/Write			
<input type="radio"/> Move Pts.				<input type="radio"/> Distribute			
<input type="radio"/> Rotate Pts.				<input checked="" type="radio"/> Project			
<input type="radio"/> Point				<input type="radio"/> Plane			
<input type="radio"/> Line				<input checked="" type="radio"/> Cylinder			
<input type="radio"/> Surface				<input type="radio"/> Sphere			
<input type="radio"/> Shell Elem							
Radius		4					
Position							
0	0	0					
Direction							
0	0	1					
<input checked="" type="radio"/> Closest 3D proj dir.							
<input type="radio"/> Vector projection							
<input checked="" type="checkbox"/> X	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> Z					
<input type="checkbox"/> Blank Blocks							
Project		Undo		Redo			

# BlockM: Multiple Examples

## □ Solid Cylindrical Rod

- Below are the commands representing the cylindrical rod above in **BlockM**.
- There are only 3 lines. So, modifying this model, such as adding more element, is quite trivial.

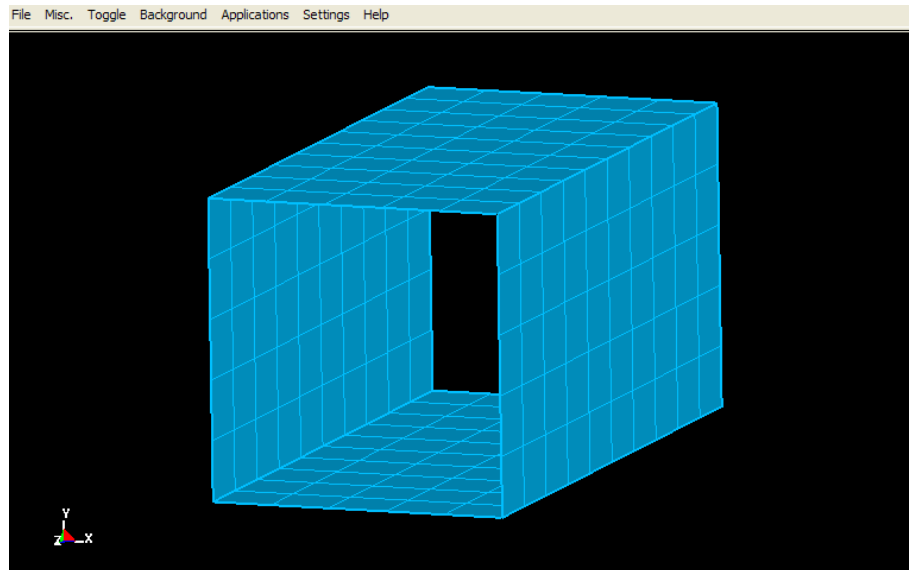
```
bmcreate multiple i 1 6 11 16 j 1 6 11 16 k 1 21 x -2 -2 2 2 y -2 -2  
2 2 z 0 10  
bmdeletei i 1 2 0 3 4 j 1 2 0 3 4 k 1 2  
bmproject i -1 0 2 3 0 -4 j -1 0 2 3 0 -4 k cylinder 0 0 0 0 1 4  
xyz
```

1	2	3	4	5	6	7	D
Blockm Interface							
<input checked="" type="radio"/> Create				<input type="radio"/> Parameter			
<input type="radio"/> Blank/Del				<input type="radio"/> Rd/Write			
<input type="radio"/> Move Pts.				<input type="radio"/> Distribute			
<input type="radio"/> Rotate Pts.				<input type="radio"/> Project			
Type: Multiple Blocks							
I Index List:							
1 6 11 16							
J Index List:							
1 6 11 16							
K Index List:							
1 21							
X Position List:							
-2 -2 2 2							
Y Position List:							
-2 -2 2 2							
Z Position List:							
0 10							
Create							
Part ID: 1				PList			
Reject	Accept	Done					

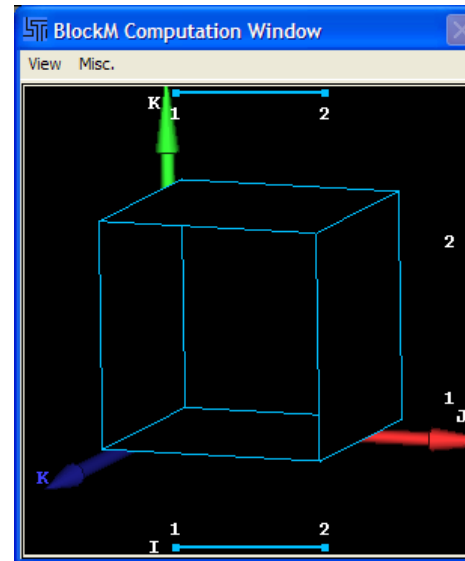
# BlockM: Multiple Examples

## □ Shell Cylindrical Pipe

- To the right is how we setup and initialize the block for a cylindrical pipe with shell elements.
- Note the minus signs in the index fields for shell specification.



Main Window



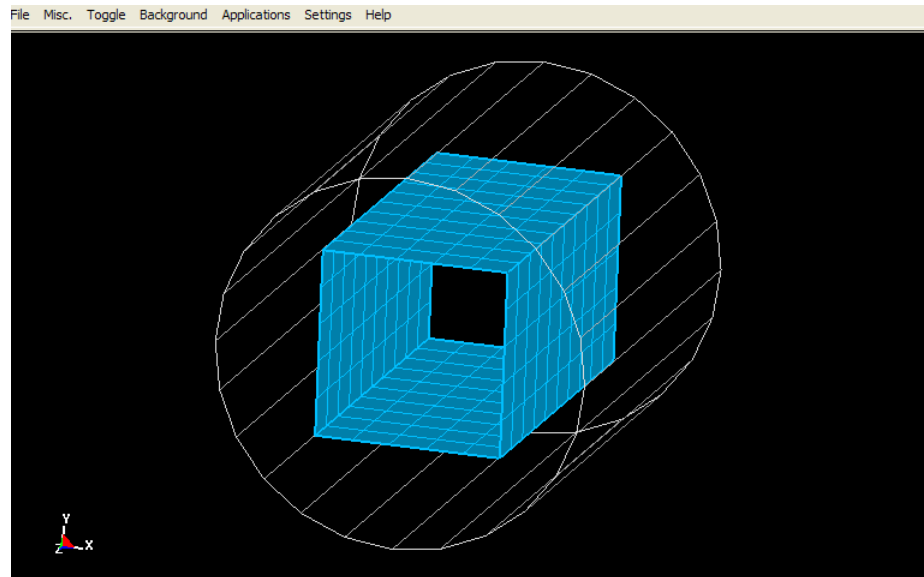
Computation Window

1	2	3	4	5	6	7	D
Blockm Interface							
<input checked="" type="radio"/> Create	<input type="radio"/> Parameter						
<input type="radio"/> Blank/Del	<input type="radio"/> Rd/Write						
<input type="radio"/> Move Pts.	<input type="radio"/> Distribute						
<input type="radio"/> Rotate Pts.	<input type="radio"/> Project						
Type: Multiple Blocks							
I Index List:							
-1 -6							
J Index List:							
-1 -6							
K Index List:							
1 11							
X Position List:							
-1 1							
Y Position List:							
-1 1							
Z Position List:							
0 4							
Create							
Part ID: 1	PList						Done
Reject	Accept						

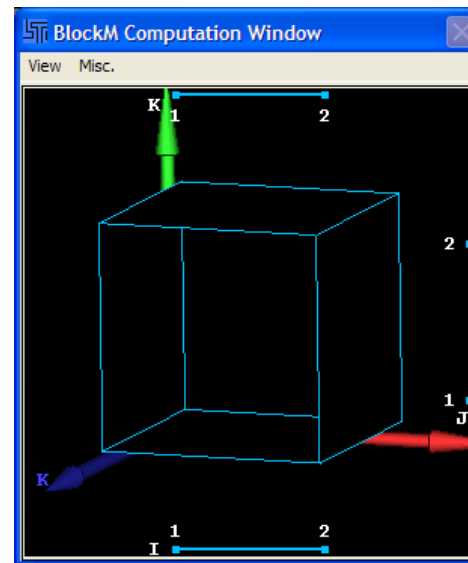
# BlockM: Multiple Examples

## □ Shell Cylindrical Pipe

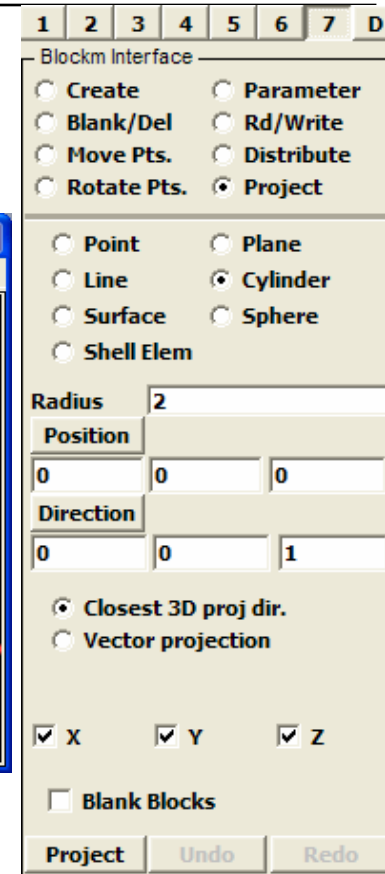
- There is no deletion needed.
- All we need to do is define a cylindrical surface with a radius of 2, in the Z-direction.



Main Window



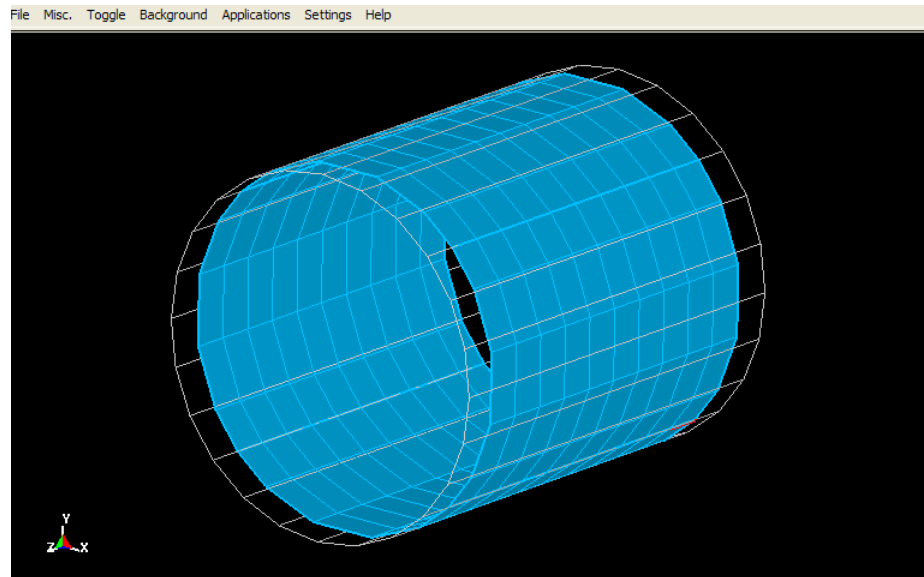
Computation Window



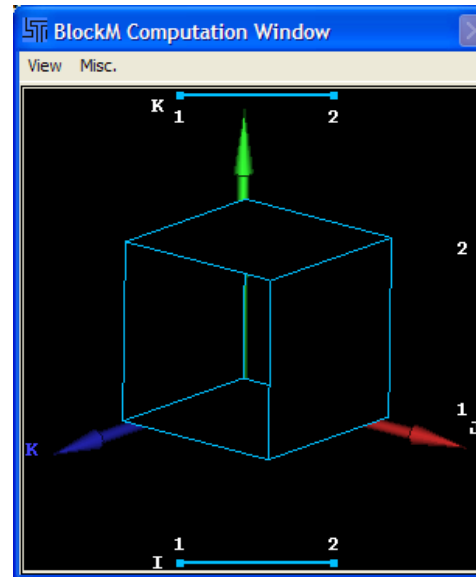
# BlockM: Multiple Examples

## □ Shell Cylindrical Pipe

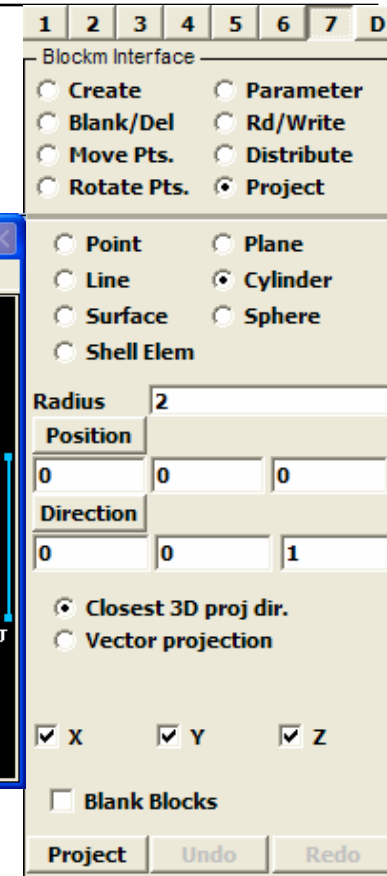
- Finally, we select the 4 faces using the Computation window and project.



Main Window



Computation Window



# BlockM: Multiple Examples

## □ Shell Cylindrical Pipe

- From the command file below, we see that it only takes 2 lines to generate a cylindrical shell in BlockM. How easy could it get?

```
bmcreate multiple i -1 -6 j -1 -6 k 1 11 x -1 1 y -1 1 z 0 4  
bmproject i -1 -2 j -1 -2 k cylinder 0 0 0 0 1 2 xyz
```

Blockm Interface

Create     Parameter  
 Blank/Del     Rd/Write  
 Move Pts.     Distribute  
 Rotate Pts.     Project

Type: Multiple Blocks

I Index List:  
-1 -6

J Index List:  
-1 -6

K Index List:  
1 11

X Position List:  
-1 1

Y Position List:  
-1 1

Z Position List:  
0 4

Create

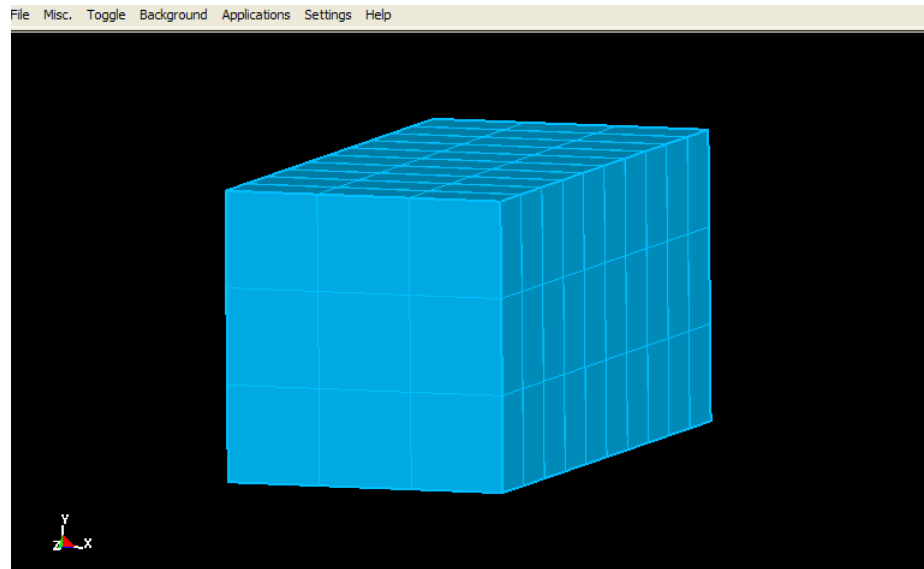
Part ID: 1    PList

Reject    Accept    Done

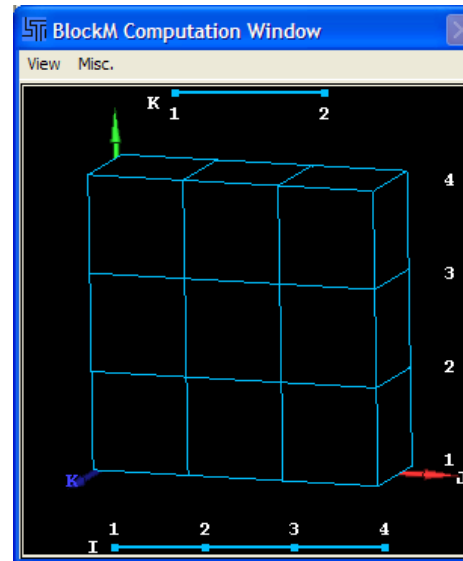
# BlockM: Multiple Examples

## □ Solid Cylindrical Pipe

- Again, to the right is how we setup and initialize the block for a cylindrical pipe with solid elements.
- Notice the position of the indices in the I and J directions. This has the effect of collapsing the outer elements onto the inner ones.



Main Window



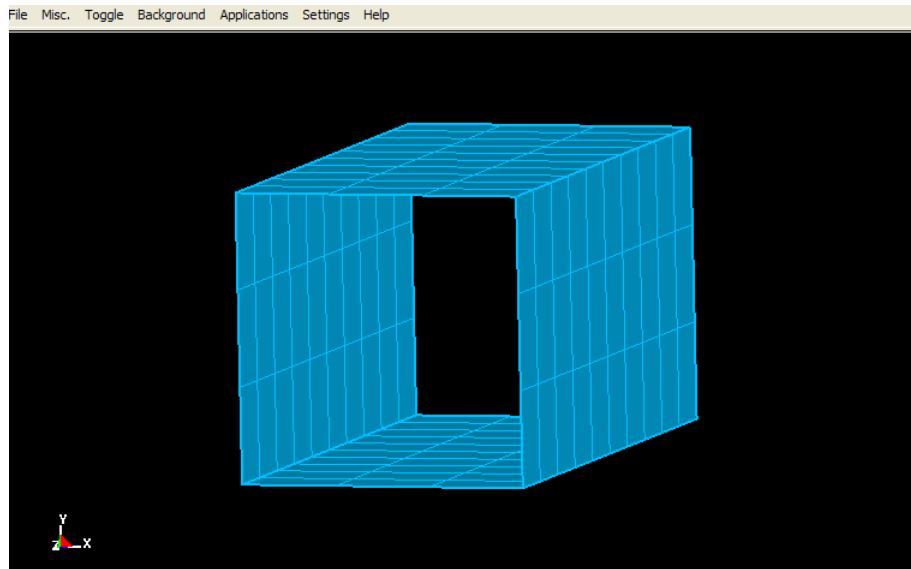
Computation Window

1	2	3	4	5	6	7	D
Blockm Interface							
<input checked="" type="radio"/> Create	<input type="radio"/> Parameter						
<input type="radio"/> Blank/Del	<input type="radio"/> Rd/Write						
<input type="radio"/> Move Pts.	<input type="radio"/> Distribute						
<input type="radio"/> Rotate Pts.	<input type="radio"/> Project						
Type: Multiple Blocks							
I Index List:							
1 2 5 6							
J Index List:							
1 2 5 6							
K Index List:							
1 11							
X Position List:							
-1 -1 1 1							
Y Position List:							
-1 -1 1 1							
Z Position List:							
0 4							
Create							
Part ID: 1							PList
Reject	Accept					Done	

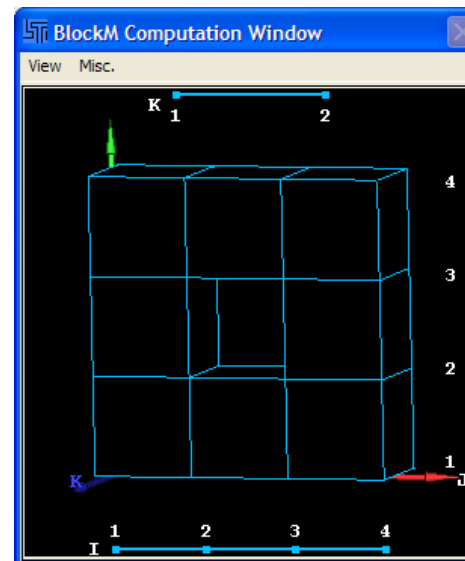
# BlockM: Multiple Examples

## □ Solid Cylindrical Pipe

- Here, we need to delete the center region in order to form a hole.
- Because of the we initialized the block, regions left over appear to be shell elements. Don't be alarmed, they are still solid elements.



Main Window



Computation Window

1 2 3 4 5 6 7 D

Blockm Interface

Create       Parameter

Blank/Del       Rd/Write

Move Pts.       Distribute

Rotate Pts.       Project

I Index List:

2 3

J Index List:

2 3

K Index List:

1 2

(Un)Blank

Reverse Blank

Display All

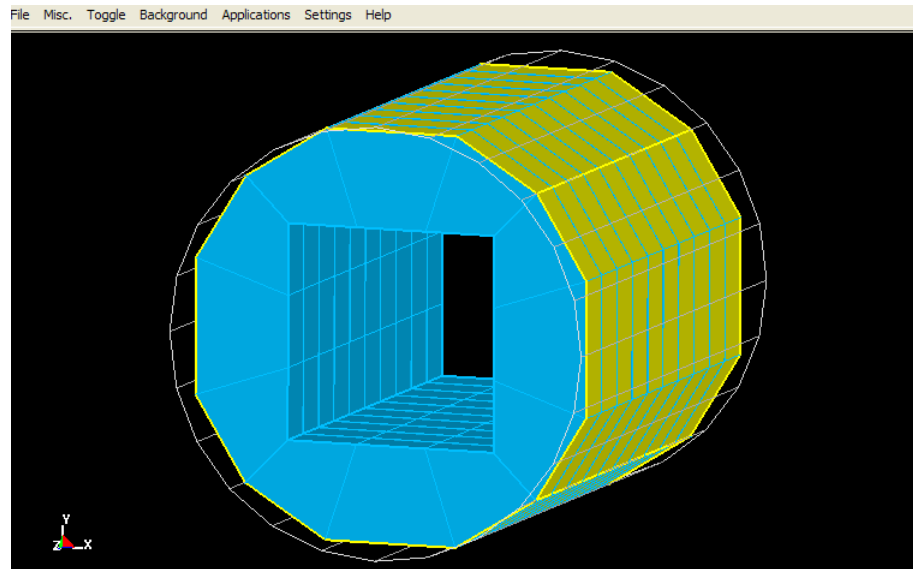
Delete

Undelete

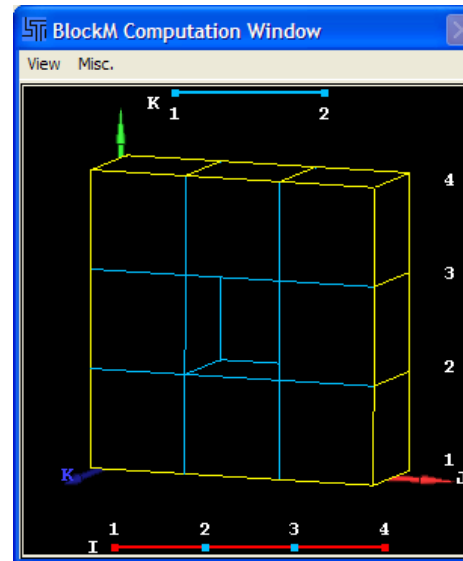
# BlockM: Multiple Examples

## □ Solid Cylindrical Pipe

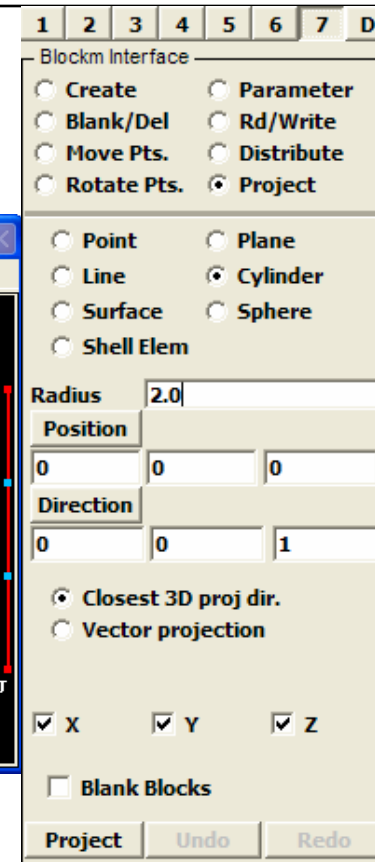
- We first project the outer faces to a cylindrical surface with a radius of 2.0.
- Notice how the elements are “stretched” out.



Main Window



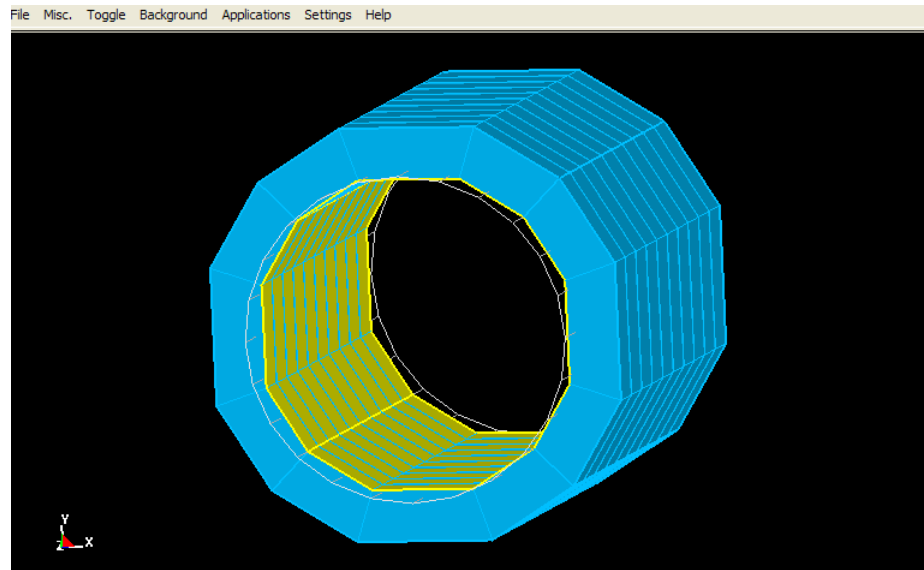
Computation Window



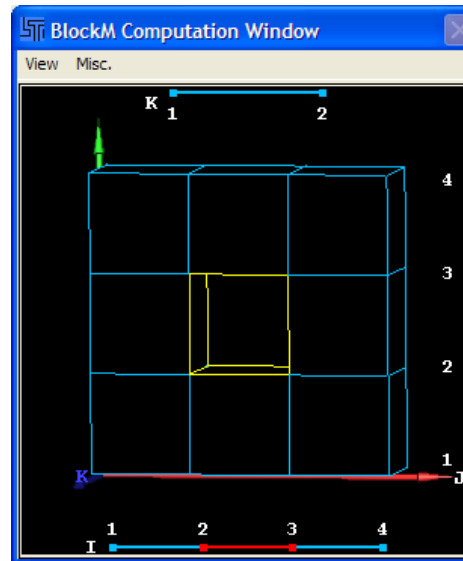
# BlockM: Multiple Examples

## □ Solid Cylindrical Pipe

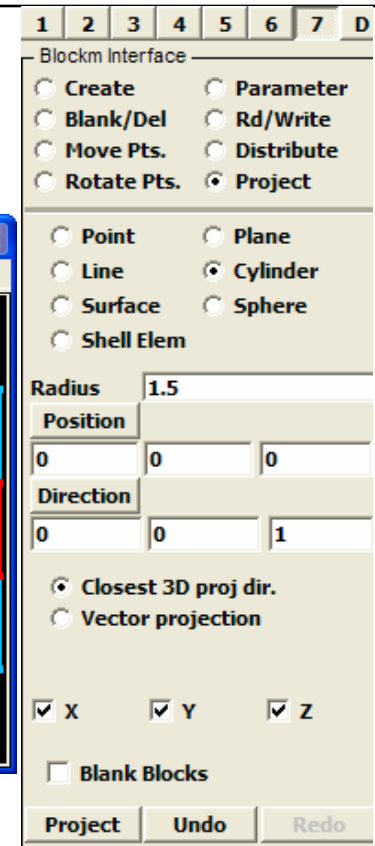
- Now, we project the inner free surfaces to a smaller cylindrical surface with a radius of 1.5.
- This model appears to be a bit coarse. However, this is not a problem because we could easily increase elements with the BlockM command file.



Main Window



Computation Window



# BlockM: Multiple Examples

## □ Solid Cylindrical Pipe

- This model only requires 4 commands to generate. This is still quite small.

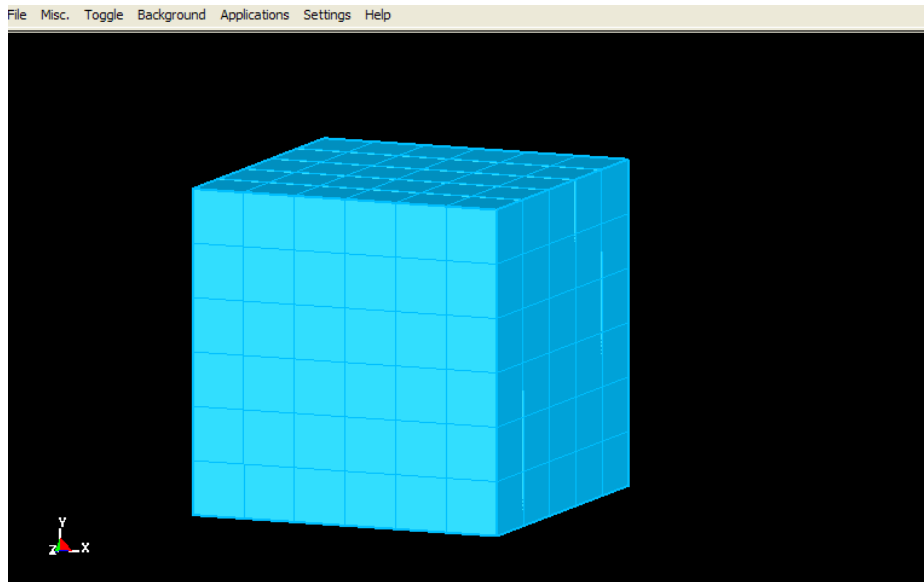
```
bmcreate multiple i 1 2 5 6 j 1 2 5 6 k 1 11 x -1 -1 1 1 y -1 -1 1 1  
z 0 4  
bmdeletei i 2 3 j 2 3 k 1 2  
bmproject i -1 -4 j -1 -4 k cylinder 0 0 0 0 1 2 xyz  
bmproject i -2 -3 j -2 -3 k cylinder 0 0 0 0 1 1.5 xyz
```

1	2	3	4	5	6	7	D
Blockm Interface							
<input checked="" type="radio"/> Create				<input type="radio"/> Parameter			
<input type="radio"/> Blank/Del				<input type="radio"/> Rd/Write			
<input type="radio"/> Move Pts.				<input type="radio"/> Distribute			
<input type="radio"/> Rotate Pts.				<input type="radio"/> Project			
Type: Multiple Blocks							
I Index List:							
1 2 5 6							
J Index List:							
1 2 5 6							
K Index List:							
1 11							
X Position List:							
-1 -1 1 1							
Y Position List:							
-1 -1 1 1							
Z Position List:							
0 4							
Create							
Part ID:	1			PList			
Reject	Accept			Done			

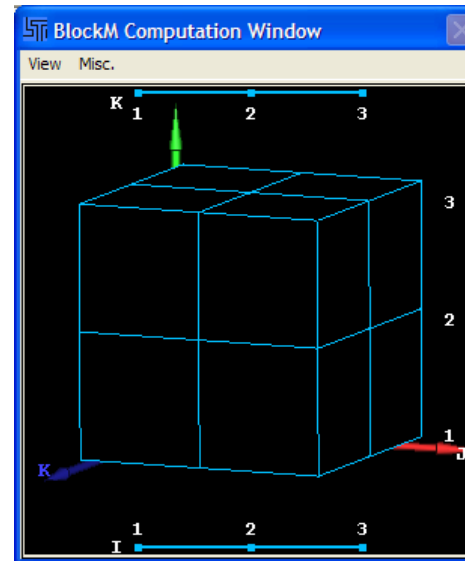
# BlockM: Multiple Examples

## □ Solid Quarter Sphere

- In this example, we initialize the block slightly different than in previous examples. However, the effect is still the same.
- Note the I and J index fields to the right. We are not starting with 1 here.



Main Window



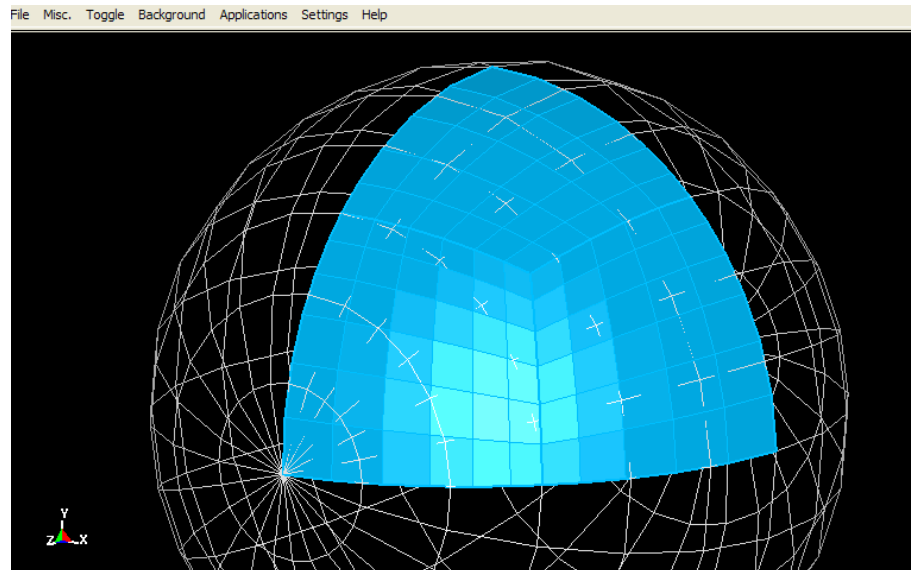
Computation Window

1	2	3	4	5	6	7	D
Blockm Interface							
<input checked="" type="radio"/> Create				<input type="radio"/> Parameter			
<input type="radio"/> Blank/Del				<input type="radio"/> Rd/Write			
<input type="radio"/> Move Pts.				<input type="radio"/> Distribute			
<input type="radio"/> Rotate Pts.				<input type="radio"/> Project			
Type: Multiple Blocks							
I Index List:							
5 11 16							
J Index List:							
5 11 16							
K Index List:							
1 6 11							
X Position List:							
0 2 2							
Y Position List:							
0 2 2							
Z Position List:							
0 2 2							
Create							
Part ID: 1		PList					
Reject		Accept		Done			

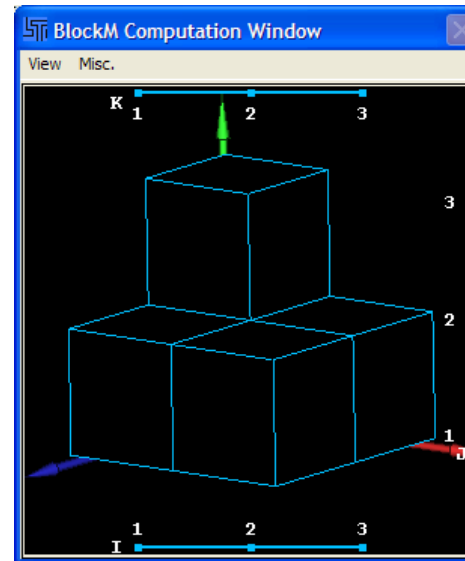
# BlockM: Multiple Examples

## □ Solid Quarter Sphere

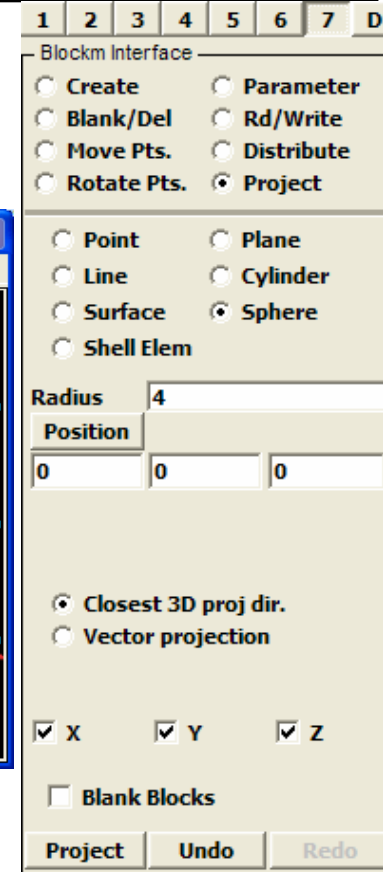
- Next, we delete the regions as seen below in the Computation window.
- Then, we specify a sphere with a radius of 4.
- Finally, we select all the outer faces and project.



Main Window

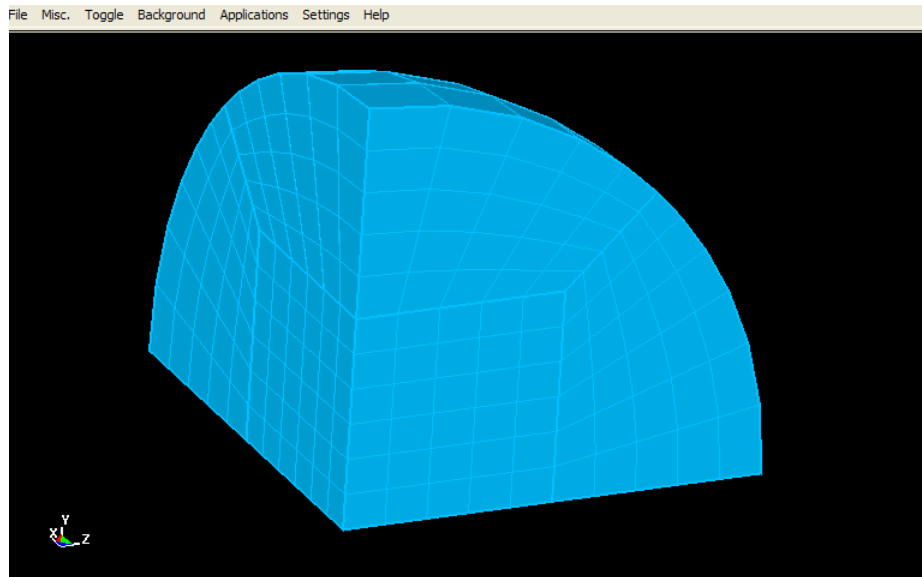


Computation Window

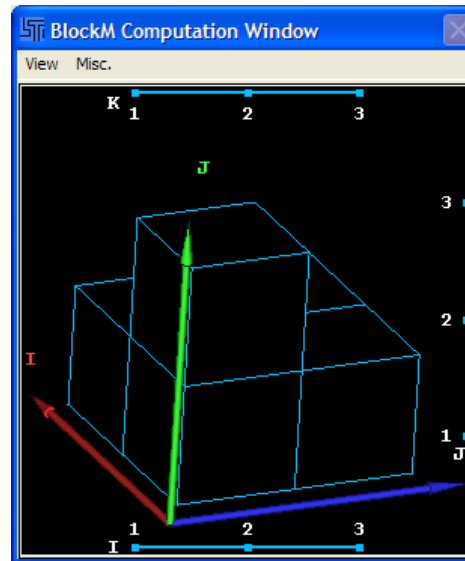


# BlockM: Multiple Examples

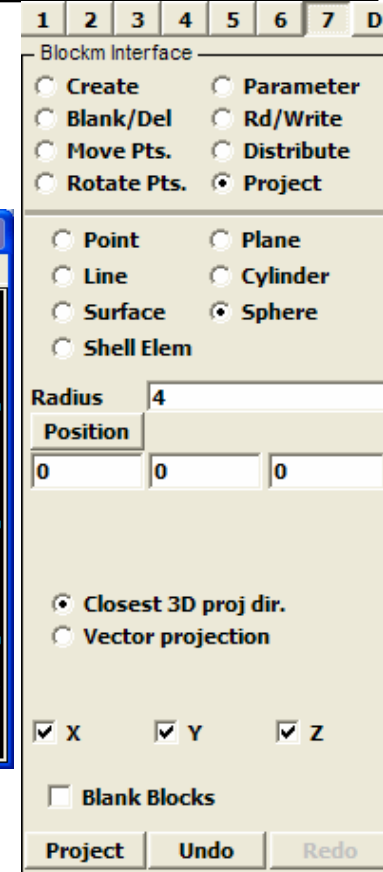
## □ Solid Quarter Sphere



Main Window



Computation Window



# BlockM: Multiple Examples

## □ Solid Quarter Sphere

```
bmcreate multiple i 5 11 16 j 5 11 16 k 1 6 11 x 0 2 2 y 0 2 2  
z 0 2 2
```

```
bmdeletei i 1 3 j 2 3 k 1 2
```

```
bmundeletei i 1 3 j 2 3 k 1 2
```

```
bmdeletei i 2 3 j 2 3 k 1 3
```

```
bmdeletei i 1 2 j 2 3 k 2 3
```

```
bmproject i 1 2 j -3 k 1 2 sphere 0 0 0 4 xyz
```

```
bmproject i 1 -3 j 1 2 k 1 -3 sphere 0 0 0 4 xyz
```

1	2	3	4	5	6	7	D
Blockm Interface							
<input checked="" type="radio"/> Create				<input type="radio"/> Parameter			
<input type="radio"/> Blank/Del				<input type="radio"/> Rd/Write			
<input type="radio"/> Move Pts.				<input type="radio"/> Distribute			
<input type="radio"/> Rotate Pts.				<input type="radio"/> Project			
Type: <input type="text" value="Multiple Blocks"/>							
I Index List:							
<input type="text" value="5 11 16"/>							
J Index List:							
<input type="text" value="5 11 16"/>							
K Index List:							
<input type="text" value="1 6 11"/>							
X Position List:							
<input type="text" value="0 2 2"/>							
Y Position List:							
<input type="text" value="0 2 2"/>							
Z Position List:							
<input type="text" value="0 2 2"/>							
<input type="button" value="Create"/>							
Part ID:	<input type="text" value="1"/>	<input type="button" value="PList"/>					
<input type="button" value="Reject"/>	<input type="button" value="Accept"/>	<input type="button" value="Done"/>					