# CS 524 Task 2

This document provides an annotated description of the files provided in the archive for this task. Further details were addressed in this week's lectures. See the last page for download and installation instructions.

The input is case sensitive. Whitespace does not matter. The input (`.blk`) and output (`.gnu`) filenames must be provided as arguments. The provide JAR serves as a complete working example.

The `define` command defines a three-dimensional box that may optionally connect to other boxes. The variable identifier must be unique. Each has the following required elements:

- an arbitrary identifier, which is used only in the output.
- a volume in arbitrary units, defined as (length, width, height) corresponding to (*x*, *y*, *z*). It uses a left-hand coordinate system: *x* increases to the right, *y* toward the viewer, and *z* up, respectively.
- a socket, which is the origin of the box. See the `exportToGnuplot` for more details.

In addition, the box may have any number of subcomponents, each of which has its socket anchored at the `at` position on its parent box.

The `printXML` command takes the identifier from any `define` command and a filename and writes the output file (`.xml`) in XML format. See the examples for the format. It is an error to refer to a nonexistent identifier.

The `exportToGnuplot` command takes the identifier from any `define` command and writes its output in Gnuplot format to the output file specified in the call to `main()`. See the examples for the format. The socket of the box is anchored in the world by one or more arguments after the identifier. Multiple overlaid outputs are messy, but they capture basic motion without a lot of complexity. It is an error to refer to a nonexistent identifier.

It is possible to print or export any defined component, which recursively applies to any subcomponents.

## Test A

### Description

This test generates a hull only.

### Input File

```
// testA.blk: hull only

define a = (
            id="a.myHull"
            volume=[6,4,3]
            socket=[0,0,-1.5]
           );

printXML(a, "testA.xml");

exportToGnuplot(a,[0,0,0]);
```

### XML Output

Indentation is not expected.

```
<component identifier="a.myHull">
 <size>
  <triple x="6.0" y="4.0" z="3.0"/>
 </size>
 <socket>
  <triple x="0.0" y="0.0" z="-1.5"/>
 </socket>
</component>
```

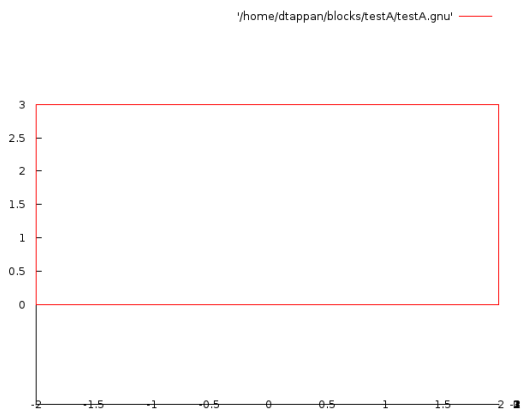
## Gnuplot Output

# comments are required. Vertical spacing is critical.

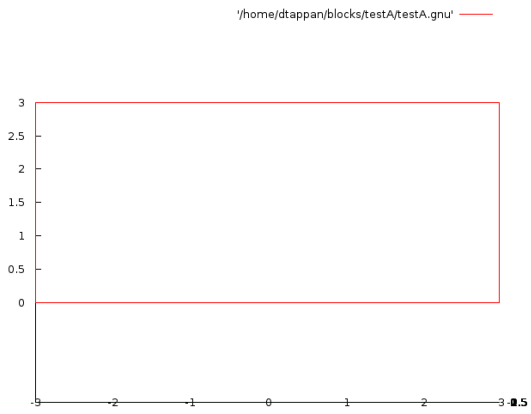
```
# component [a.myHull] {
# top
-3.0 -2.0 3.0
3.0 -2.0 3.0
3.0 2.0 3.0
-3.0 2.0 3.0
-3.0 -2.0 3.0

# bottom
-3.0 -2.0 0.0
3.0 -2.0 0.0
3.0 2.0 0.0
-3.0 2.0 0.0
-3.0 -2.0 0.0


# } component [a.myHull]
```

## Gnuplot Rendering

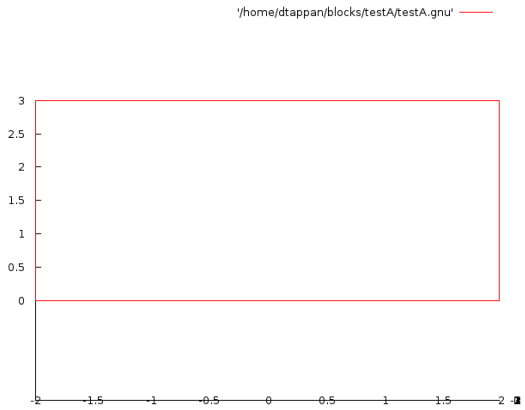
Top View



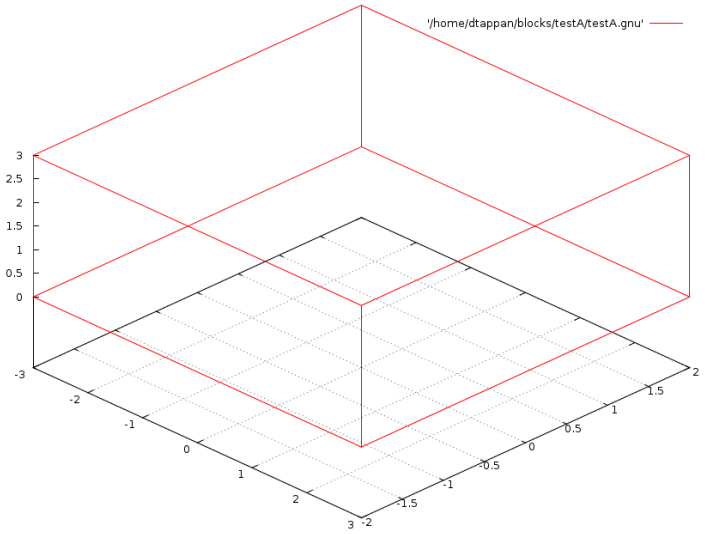

Side View



## Front View




## Orthogonal View



## Test B

### Description

This test generates a hull with a turret.

### Input File

```
// testB.blk: hull with turret

define b = (
            id="b.myHull"
            volume=[6,4,3]
            socket=[0,0,-1.5]
            connectsTo
            (
             (
              id="b.myTurret"
              volume=[2,2,1]
              socket=[0,0,-0.5]
             ) at [-1,0,1.5]
            )
           );

printXML(b, "testB.xml");

exportToGnuplot(b,[0,0,0]);
```

### XML Output

```
<component identifier="b.myHull">
 <size>
  <triple x="6.0" y="4.0" z="3.0"/>
 </size>
 <socket>
  <triple x="0.0" y="0.0" z="-1.5"/>
 </socket>
 <connections>
  <mount>
   <component identifier="b.myTurret">
    <size>
     <triple x="2.0" y="2.0" z="1.0"/>
    </size>
    <socket>
     <triple x="0.0" y="0.0" z="-0.5"/>
    </socket>
   </component>
   <ball>
    <triple x="-1.0" y="0.0" z="1.5"/>
   </ball>
  </mount>
 </connections>
</component>
```

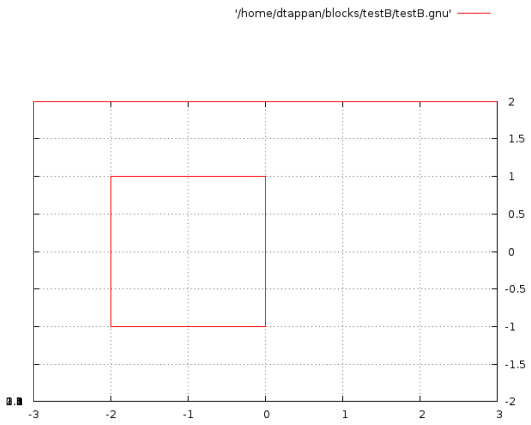
### Gnuplot Output

```
# component [b.myHull] {
# top
-3.0 -2.0 3.0
3.0 -2.0 3.0
3.0 2.0 3.0
-3.0 2.0 3.0
-3.0 -2.0 3.0

# bottom
-3.0 -2.0 0.0
3.0 -2.0 0.0
3.0 2.0 0.0
-3.0 2.0 0.0
-3.0 -2.0 0.0
```

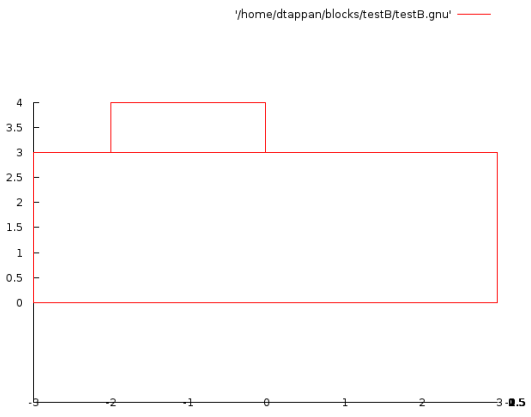
```
# subcomponents {
# component [b.myTurret] {
# top
-2.0 -1.0 4.0
0.0 -1.0 4.0
0.0 1.0 4.0
-2.0 1.0 4.0
-2.0 -1.0 4.0

# bottom
-2.0 -1.0 3.0
0.0 -1.0 3.0
0.0 1.0 3.0
-2.0 1.0 3.0
-2.0 -1.0 3.0


# } component [b.myTurret]
# } subcomponents
# } component [b.myHull]
```

## Gnuplot Rendering

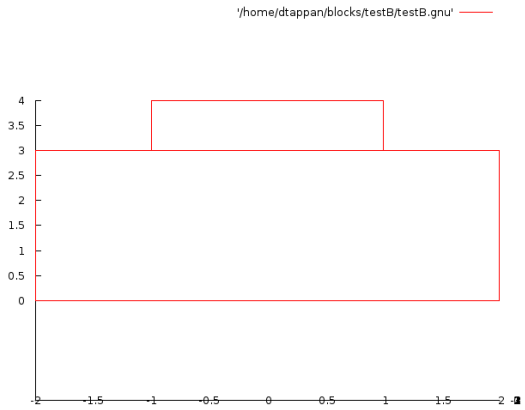
### Top View



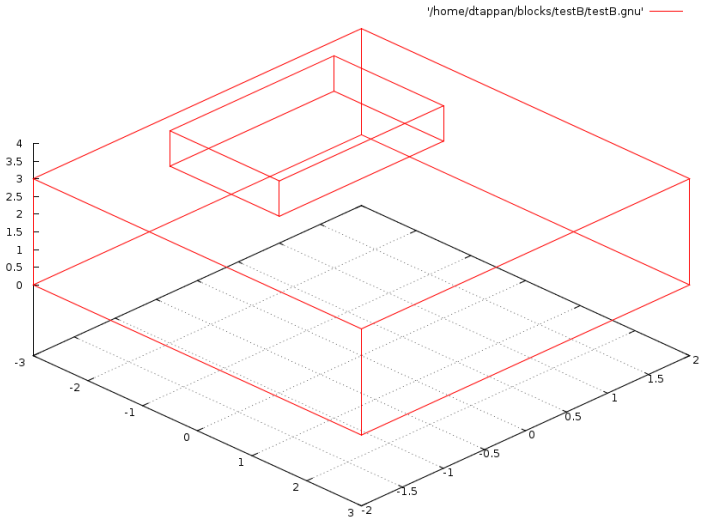

### Side View



## Front View




## Orthogonal View



## Test C

### Description

This test generates a hull with a turret and a gun.

Input File

```
// testC.blk: hull with turret and gun

define c = (
            id="c.myHull"
            volume=[6,4,3]
            socket=[0,0,-1.5]
            connectsTo
            (
             (
              id="c.myTurret"
              volume=[2,2,1]
              socket=[0,0,-0.5]
              connectsTo
              (
               (
                id="c.myGun"
                volume=[5,0.5,0.5]
                socket=[-2.5,0,0]
               ) at [1,0,0]
              )
             ) at [-1,0,1.5]
            )
           );
printXML(c, "testC.xml");
exportToGnuplot(c,[0,0,0]);
```

### XML Output

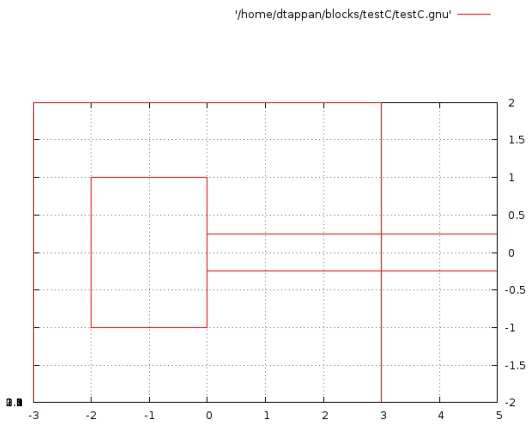
```
<component identifier="c.myHull">
 <size>
  <triple x="6.0" y="4.0" z="3.0"/>
 </size>
 <socket>
  <triple x="0.0" y="0.0" z="-1.5"/>
 </socket>
 <connections>
  <mount>
   <component identifier="c.myTurret">
    <size>
     <triple x="2.0" y="2.0" z="1.0"/>
    </size>
    <socket>
     <triple x="0.0" y="0.0" z="-0.5"/>
    </socket>
    <connections>
     <mount>
      <component identifier="c.myGun">
       <size>
        <triple x="5.0" y="0.5" z="0.5"/>
       </size>
       <socket>
        <triple x="-2.5" y="0.0" z="0.0"/>
       </socket>
      </component>
      <ball>
       <triple x="1.0" y="0.0" z="0.0"/>
      </ball>
     </mount>
    </connections>
   </component>
   <ball>
    <triple x="-1.0" y="0.0" z="1.5"/>
   </ball>
  </mount>
 </connections>
</component>
```

## Gnuplot Output

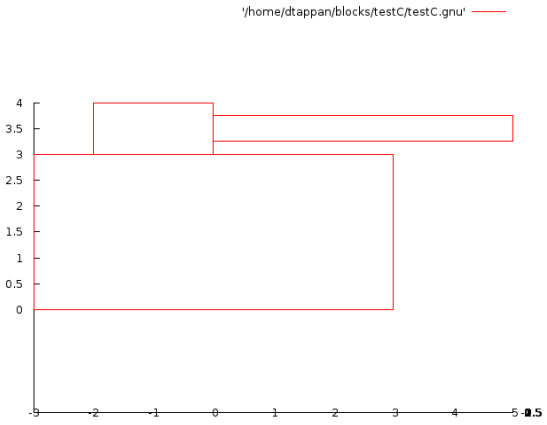
```
# component [c.myHull] {
# top
-3.0 -2.0 3.0
3.0 -2.0 3.0
3.0 2.0 3.0
-3.0 2.0 3.0
-3.0 -2.0 3.0

# bottom
-3.0 -2.0 0.0
3.0 -2.0 0.0
3.0 2.0 0.0
-3.0 2.0 0.0
-3.0 -2.0 0.0


# subcomponents {
# component [c.myTurret] {
# top
-2.0 -1.0 4.0
0.0 -1.0 4.0
0.0 1.0 4.0
-2.0 1.0 4.0
-2.0 -1.0 4.0

# bottom
-2.0 -1.0 3.0
0.0 -1.0 3.0
0.0 1.0 3.0
-2.0 1.0 3.0
-2.0 -1.0 3.0


# subcomponents {
# component [c.myGun] {
# top
0.0 -0.25 3.75
5.0 -0.25 3.75
5.0 0.25 3.75
0.0 0.25 3.75
0.0 -0.25 3.75

# bottom
0.0 -0.25 3.25
5.0 -0.25 3.25
5.0 0.25 3.25
0.0 0.25 3.25
0.0 -0.25 3.25


# } component [c.myGun]
# } subcomponents
# } component [c.myTurret]
# } subcomponents
# } component [c.myHull]
```

## Gnuplot Rendering

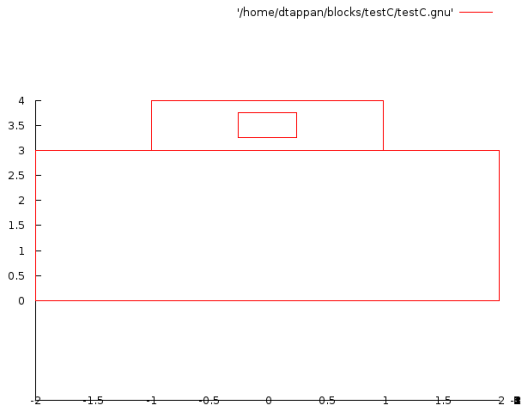
Top View



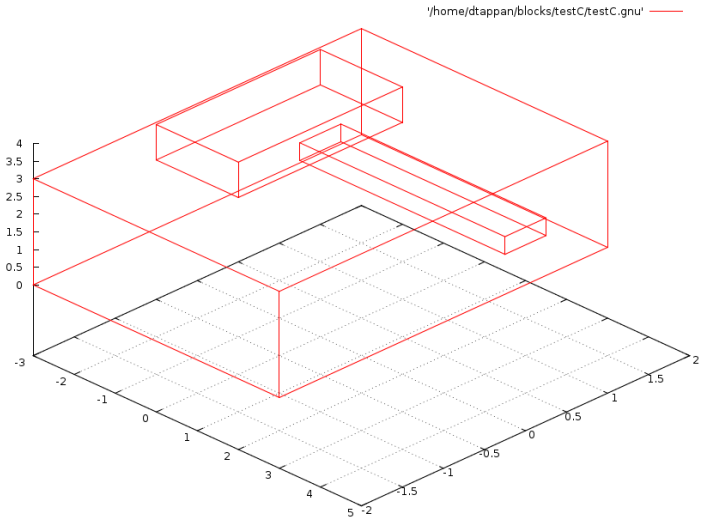

Side View



## Front View




## Orthogonal View



## Test D

### Description

This test generates a hull with a turret, gun, and sensor.

Input File

```
// testD.blk: hull with turret, gun, and sensor

define d = (
            id="d.myHull"
            volume=[6,4,3]
            socket=[0,0,-1.5]
            connectsTo
            (
             (
              id="d.myTurret"
              volume=[2,2,1]
              socket=[0,0,-0.5]
              connectsTo
              (
               (
                id="d.myGun"
                volume=[5,0.5,0.5]
                socket=[-2.5,0,0]
               ) at [1,0,0]
               (
                id="d.mySensor"
                volume=[0.5,0.5,0.5]
                socket=[0,0,-0.25]
               ) at [-0.5,0.5,0.5]
              )
             ) at [-1,0,1.5]
            )
           );

printXML(d, "testD.xml");

exportToGnuplot(d,[0,0,0]);
```

### XML Output

```
<component identifier="d.myHull">
 <size>
  <triple x="6.0" y="4.0" z="3.0"/>
 </size>
 <socket>
  <triple x="0.0" y="0.0" z="-1.5"/>
 </socket>
 <connections>
  <mount>
   <component identifier="d.myTurret">
    <size>
     <triple x="2.0" y="2.0" z="1.0"/>
    </size>
    <socket>
     <triple x="0.0" y="0.0" z="-0.5"/>
    </socket>
    <connections>
     <mount>
      <component identifier="d.myGun">
       <size>
        <triple x="5.0" y="0.5" z="0.5"/>
       </size>
       <socket>
        <triple x="-2.5" y="0.0" z="0.0"/>
       </socket>
      </component>
      <ball>
       <triple x="1.0" y="0.0" z="0.0"/>
      </ball>
     </mount>
     <mount>
      <component identifier="d.mySensor">
       <size>
```

```
        <triple x="0.5" y="0.5" z="0.5"/>
       </size>
       <socket>
        <triple x="0.0" y="0.0" z="-0.25"/>
       </socket>
      </component>
      <ball>
       <triple x="-0.5" y="0.5" z="0.5"/>
      </ball>
     </mount>
    </connections>
   </component>
   <ball>
   <triple x="-1.0" y="0.0" z="1.5"/>
   </ball>
  </mount>
 </connections>
</component>
```

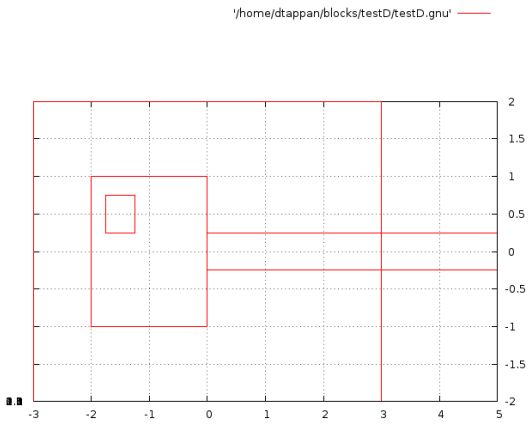
## Gnuplot Output

```
# component [d.myHull] {
# top
-3.0 -2.0 3.0
3.0 -2.0 3.0
3.0 2.0 3.0
-3.0 2.0 3.0
-3.0 -2.0 3.0

# bottom
-3.0 -2.0 0.0
3.0 -2.0 0.0
3.0 2.0 0.0
-3.0 2.0 0.0
-3.0 -2.0 0.0


# subcomponents {
# component [d.myTurret] {
# top
-2.0 -1.0 4.0
0.0 -1.0 4.0
0.0 1.0 4.0
-2.0 1.0 4.0
-2.0 -1.0 4.0

# bottom
-2.0 -1.0 3.0
0.0 -1.0 3.0
0.0 1.0 3.0
-2.0 1.0 3.0
-2.0 -1.0 3.0


# subcomponents {
# component [d.myGun] {
# top
0.0 -0.25 3.75
5.0 -0.25 3.75
5.0 0.25 3.75
0.0 0.25 3.75
0.0 -0.25 3.75

# bottom
0.0 -0.25 3.25
5.0 -0.25 3.25
5.0 0.25 3.25
0.0 0.25 3.25
0.0 -0.25 3.25


# } component [d.myGun]
# component [d.mySensor] {
# top
-1.75 0.25 4.5
-1.25 0.25 4.5
```

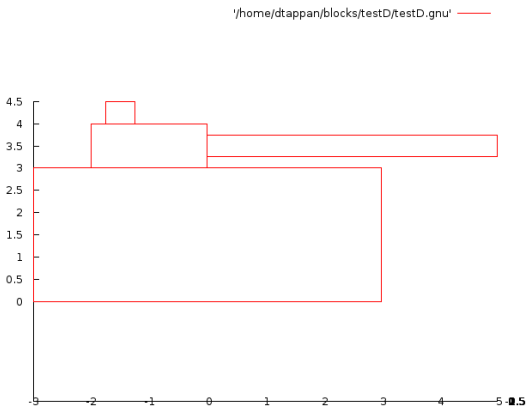
```
-1.25 0.75 4.5
-1.75 0.75 4.5
-1.75 0.25 4.5

# bottom
-1.75 0.25 4.0
-1.25 0.25 4.0
-1.25 0.75 4.0
-1.75 0.75 4.0
-1.75 0.25 4.0


# } component [d.mySensor]
# } subcomponents
# } component [d.myTurret]
# } subcomponents
# } component [d.myHull]
```

## Gnuplot Rendering

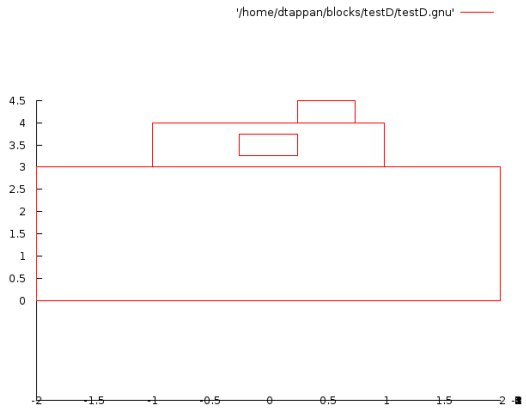
### Top View



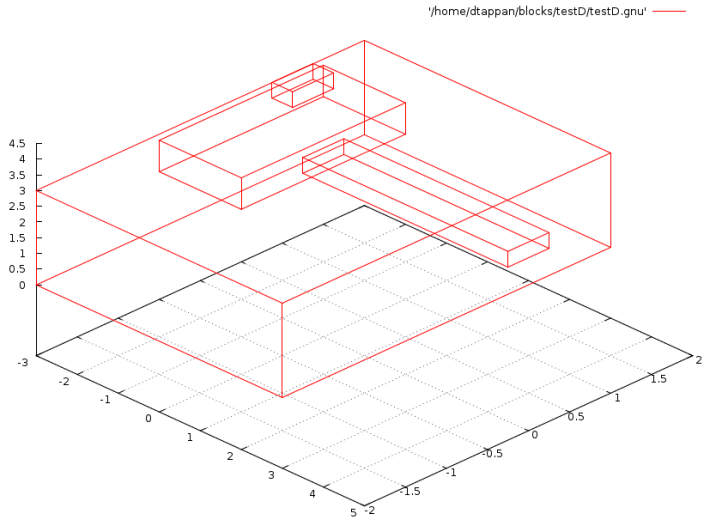

### Side View



## Front View




## Orthogonal View



## Test E

### Description

This test generates a hull with a turret, gun, and sensor and writes the Gnuplot output for movement of three units to the right.

Input File

```
// testE.blk: hull with turret, gun, and sensor

define e = (
            id="e.myHull"
            volume=[6,4,3]
            socket=[0,0,-1.5]
            connectsTo
            (
             (
              id="e.myTurret"
              volume=[2,2,1]
              socket=[0,0,-0.5]
              connectsTo
              (
               (
                id="e.myGun"
                volume=[5,0.5,0.5]
                socket=[-2.5,0,0]
               ) at [1,0,0]
               (
                id="e.mySensor"
                volume=[0.5,0.5,0.5]
                socket=[0,0,-0.25]
               ) at [-0.5,0.5,0.5]
              )
             ) at [-1,0,1.5]
            )
           );

printXML(e, "testE.xml");

exportToGnuplot(e,[0,0,0],[1,0,0],[2,0,0]);
```

### XML Output

```
<component identifier="e.myHull">
<size>
<triple x="6.0" y="4.0" z="3.0"/>
</size>
<socket>
<triple x="0.0" y="0.0" z="-1.5"/>
</socket>
<connections>
<mount>
<component identifier="e.myTurret">
<size>
<triple x="2.0" y="2.0" z="1.0"/>
</size>
<socket>
<triple x="0.0" y="0.0" z="-0.5"/>
</socket>
<connections>
<mount>
<component identifier="e.myGun">
<size>
<triple x="5.0" y="0.5" z="0.5"/>
</size>
<socket>
<triple x="-2.5" y="0.0" z="0.0"/>
</socket>
</component>
<ball>
<triple x="1.0" y="0.0" z="0.0"/>
</ball>
</mount>
<mount>
<component identifier="e.mySensor">
```

```
<size>
<triple x="0.5" y="0.5" z="0.5"/>
</size>
<socket>
<triple x="0.0" y="0.0" z="-0.25"/>
</socket>
</component>
<ball>
<triple x="-0.5" y="0.5" z="0.5"/>
</ball>
</mount>
</connections>
</component>
<ball>
<triple x="-1.0" y="0.0" z="1.5"/>
</ball>
</mount>
</connections>
</component>
```

## Gnuplot Output

```
# component [e.myHull] {
# top
-3.0 -2.0 3.0
3.0 -2.0 3.0
3.0 2.0 3.0
-3.0 2.0 3.0
-3.0 -2.0 3.0

# bottom
-3.0 -2.0 0.0
3.0 -2.0 0.0
3.0 2.0 0.0
-3.0 2.0 0.0
-3.0 -2.0 0.0


# subcomponents {
# component [e.myTurret] {
# top
-2.0 -1.0 4.0
0.0 -1.0 4.0
0.0 1.0 4.0
-2.0 1.0 4.0
-2.0 -1.0 4.0

# bottom
-2.0 -1.0 3.0
0.0 -1.0 3.0
0.0 1.0 3.0
-2.0 1.0 3.0
-2.0 -1.0 3.0


# subcomponents {
# component [e.myGun] {
# top
0.0 -0.25 3.75
5.0 -0.25 3.75
5.0 0.25 3.75
0.0 0.25 3.75
0.0 -0.25 3.75

# bottom
0.0 -0.25 3.25
5.0 -0.25 3.25
5.0 0.25 3.25
0.0 0.25 3.25
0.0 -0.25 3.25


# } component [e.myGun]
# component [e.mySensor] {
# top
-1.75 0.25 4.5
```

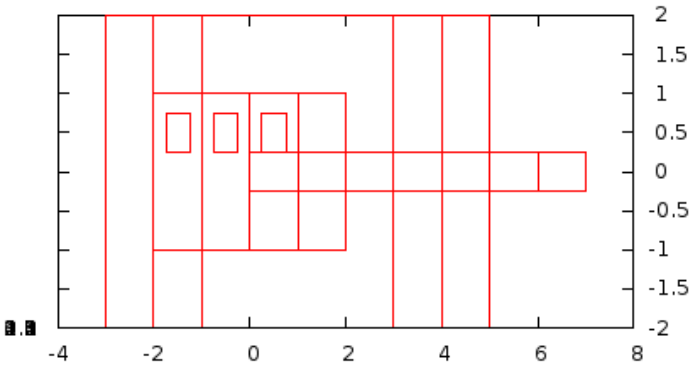
```
-1.25 0.25 4.5
-1.25 0.75 4.5
-1.75 0.75 4.5
-1.75 0.25 4.5

# bottom
-1.75 0.25 4.0
-1.25 0.25 4.0
-1.25 0.75 4.0
-1.75 0.75 4.0
-1.75 0.25 4.0


# } component [e.mySensor]
# } subcomponents
# } component [e.myTurret]
# } subcomponents
# } component [e.myHull]


# component [e.myHull] {
# top
-2.0 -2.0 3.0
4.0 -2.0 3.0
4.0 2.0 3.0
-2.0 2.0 3.0
-2.0 -2.0 3.0

# bottom
-2.0 -2.0 0.0
4.0 -2.0 0.0
4.0 2.0 0.0
-2.0 2.0 0.0
-2.0 -2.0 0.0


# subcomponents {
# component [e.myTurret] {
# top
-1.0 -1.0 4.0
1.0 -1.0 4.0
1.0 1.0 4.0
-1.0 1.0 4.0
-1.0 -1.0 4.0

# bottom
-1.0 -1.0 3.0
1.0 -1.0 3.0
1.0 1.0 3.0
-1.0 1.0 3.0
-1.0 -1.0 3.0


# subcomponents {
# component [e.myGun] {
# top
1.0 -0.25 3.75
6.0 -0.25 3.75
6.0 0.25 3.75
1.0 0.25 3.75
1.0 -0.25 3.75

# bottom
1.0 -0.25 3.25
6.0 -0.25 3.25
6.0 0.25 3.25
1.0 0.25 3.25
1.0 -0.25 3.25


# } component [e.myGun]
# component [e.mySensor] {
# top
-0.75 0.25 4.5
-0.25 0.25 4.5
-0.25 0.75 4.5
```

```
-0.75 0.75 4.5
-0.75 0.25 4.5

# bottom
-0.75 0.25 4.0
-0.25 0.25 4.0
-0.25 0.75 4.0
-0.75 0.75 4.0
-0.75 0.25 4.0


# } component [e.mySensor]
# } subcomponents
# } component [e.myTurret]
# } subcomponents
# } component [e.myHull]


# component [e.myHull] {
# top
-1.0 -2.0 3.0
5.0 -2.0 3.0
5.0 2.0 3.0
-1.0 2.0 3.0
-1.0 -2.0 3.0

# bottom
-1.0 -2.0 0.0
5.0 -2.0 0.0
5.0 2.0 0.0
-1.0 2.0 0.0
-1.0 -2.0 0.0


# subcomponents {
# component [e.myTurret] {
# top
0.0 -1.0 4.0
2.0 -1.0 4.0
2.0 1.0 4.0
0.0 1.0 4.0
0.0 -1.0 4.0

# bottom
0.0 -1.0 3.0
2.0 -1.0 3.0
2.0 1.0 3.0
0.0 1.0 3.0
0.0 -1.0 3.0


# subcomponents {
# component [e.myGun] {
# top
2.0 -0.25 3.75
7.0 -0.25 3.75
7.0 0.25 3.75
2.0 0.25 3.75
2.0 -0.25 3.75

# bottom
2.0 -0.25 3.25
7.0 -0.25 3.25
7.0 0.25 3.25
2.0 0.25 3.25
2.0 -0.25 3.25


# } component [e.myGun]
# component [e.mySensor] {
# top
0.25 0.25 4.5
0.75 0.25 4.5
0.75 0.75 4.5
0.25 0.75 4.5
0.25 0.25 4.5
```

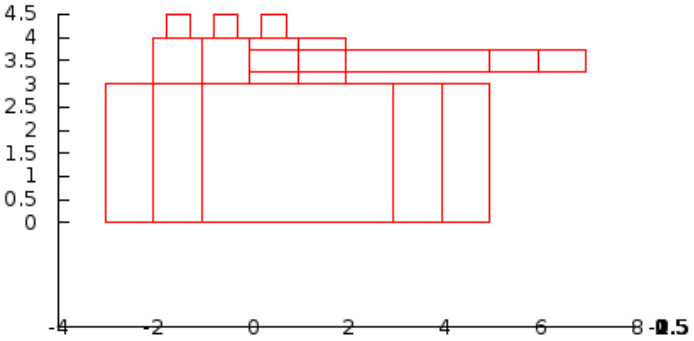
```
# bottom
0.25 0.25 4.0
0.75 0.25 4.0
0.75 0.75 4.0
0.25 0.75 4.0
0.25 0.25 4.0


# } component [e.mySensor]
# } subcomponents
# } component [e.myTurret]
# } subcomponents
# } component [e.myHull]
```

## Gnuplot Rendering

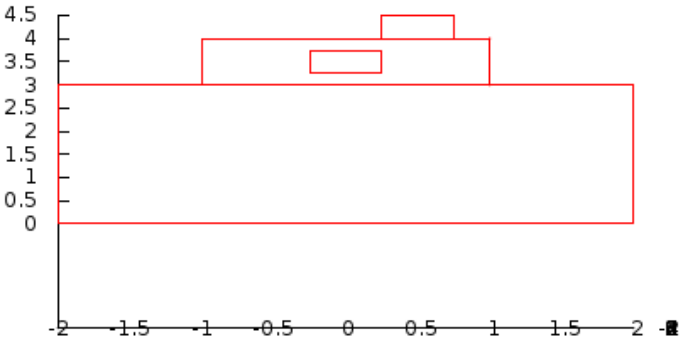
Top View



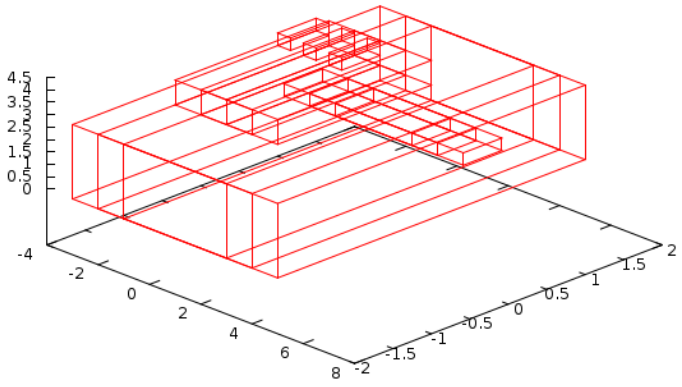

Side View




Front View



Orthogonal View




## JavaCC Grammar

See `language.html` for complete details. See `language_demo.jj` for additional hints.

```
parse                ::= ( Command )* <EOF>
Connections          ::= <CONNECTS_TO> <LPAREN> ( ComponentDefinition <AT> Triple )+ <RPAREN>
Command              ::= ( Define | ExportToGnuplot | PrintXML ) <SEMICOLON>
ComponentDefinition  ::= <LPAREN> Identifier Volume Socket ( Connections )? <RPAREN>
Define               ::= <DEFINE> Variable <ASSIGN> ComponentDefinition
ExportToGnuplot      ::= <EXPORT_TO_GNUPLOT> <LPAREN> Variable <COMMA> Triple ( <COMMA> Triple )* <RPAREN>
Identifier           ::= <ID> <ASSIGN> <LITERAL_STRING>
PrintXML             ::= <PRINT_XML> <LPAREN> Variable <COMMA> <LITERAL_STRING> <RPAREN>
Socket               ::= <SOCKET> <ASSIGN> Triple
Triple               ::= <LBRACKET> <LITERAL_NUMBER> <COMMA> <LITERAL_NUMBER> <COMMA> <LITERAL_NUMBER> <RBRACKET>
Variable             ::= <IDENTIFIER>
Volume               ::= <VOLUME> <ASSIGN> Triple
```

## JavaCC Installation

Installation may vary depending on your operating system and IDE. Do the following in Eclipse:

Help → Install New Software.

Work with: `http://eclipse-javacc.sourceforge.net/`

Click the checkbox for JavaCC Eclipse Plug-in .

Next, accept terms, etc. Accept the unsigned content.

It will install the plug-in and restart Eclipse.

Create a project for `cs524builder`

Right-click `language_demo.jj` in the Project Explorer window.

Select Compile with JavaCC .

Run it from the green circle with the white arrow in it. You first have to set up the run configuration to point to `BuilderDemo`, along with the input filename (`demo.txt`) and output filename (your choice, not used in the demo) in the *Arguments->Program arguments*. The black down arrow right of the green circle opens this dialog through *Run Configurations*.

## Gnuplot Commands

To render: `splot 'testA.gnu' with lines`

To set the scale, use the *Apply autoscale* button.

Use `set size square` to ensure the axes are scaled equally.

To set the perspective:

| | |
|---|---|
| top: | `set view 0,0` |
| side: | `set view 90,0` |
| front: | `set view 90,90` |
| orthogonal: | `set view 45,45` |

## Working Solution

A complete, working solution is available in `blocks.jar`:

`java -jar blocks.jar` *`infilename_blk outfilename_gnu`*

## Execution Trace

At the top of the `.jj` parser file is the option `DEBUG_PARSER`. If you change it to `true` and regenerate the Java files with JavaCC, it will print the execution trace of your grammar on your input. For example, `testA.blk` looks like this:

```
Call:   parse
  Call:   Command
    Call:   Define
      Consumed token: <"define" at line 3 column 1>
      Call:   Variable
        Consumed token: <<IDENTIFIER>: "a" at line 3 column 8>
      Return: Variable
      Consumed token: <"=" at line 3 column 10>
      Call:   ComponentDefinition
        Consumed token: <"(" at line 3 column 12>
        Call:   Identifier
          Consumed token: <"id" at line 4 column 13>
          Consumed token: <"=" at line 4 column 15>
          Consumed token: <<LITERAL_STRING>: ""a.myHull"" at line 4 column 16>
        Return: Identifier
        Call:   Volume
          Consumed token: <"volume" at line 5 column 13>
          Consumed token: <"=" at line 5 column 19>
          Call:   Triple
            Consumed token: <"[" at line 5 column 20>
            Consumed token: <<LITERAL_NUMBER>: "6" at line 5 column 21>
            Consumed token: <"," at line 5 column 22>
            Consumed token: <<LITERAL_NUMBER>: "4" at line 5 column 23>
            Consumed token: <"," at line 5 column 24>
            Consumed token: <<LITERAL_NUMBER>: "3" at line 5 column 25>
            Consumed token: <"]" at line 5 column 26>
          Return: Triple
        Return: Volume
        Call:   Socket
          Consumed token: <"socket" at line 6 column 13>
          Consumed token: <"=" at line 6 column 19>
          Call:   Triple
            Consumed token: <"[" at line 6 column 20>
            Consumed token: <<LITERAL_NUMBER>: "0" at line 6 column 21>
            Consumed token: <"," at line 6 column 22>
            Consumed token: <<LITERAL_NUMBER>: "0" at line 6 column 23>
            Consumed token: <"," at line 6 column 24>
            Consumed token: <<LITERAL_NUMBER>: "-1.5" at line 6 column 25>
            Consumed token: <"]" at line 6 column 29>
          Return: Triple
        Return: Socket
        Consumed token: <")" at line 7 column 12>
      Return: ComponentDefinition
    Return: Define
    Consumed token: <";" at line 7 column 13>
  Return: Command
  Call:   Command
    Call:   PrintXML
      Consumed token: <"printXML" at line 9 column 1>
      Consumed token: <"(" at line 9 column 9>
      Call:   Variable
        Consumed token: <<IDENTIFIER>: "a" at line 9 column 10>
      Return: Variable
      Consumed token: <"," at line 9 column 11>
      Consumed token: <<LITERAL_STRING>: ""testA.xml"" at line 9 column 12>
      Consumed token: <")" at line 9 column 23>
    Return: PrintXML
    Consumed token: <";" at line 9 column 24>
  Return: Command
  Call:   Command
    Call:   ExportToGnuplot
      Consumed token: <"exportToGnuplot" at line 11 column 1>
      Consumed token: <"(" at line 11 column 16>
      Call:   Variable
```

```
        Consumed token: <<IDENTIFIER>: "a" at line 11 column 17>
      Return: Variable
      Consumed token: <"," at line 11 column 18>
      Call:   Triple
        Consumed token: <"[" at line 11 column 19>
        Consumed token: <<LITERAL_NUMBER>: "0" at line 11 column 20>
        Consumed token: <"," at line 11 column 21>
        Consumed token: <<LITERAL_NUMBER>: "0" at line 11 column 22>
        Consumed token: <"," at line 11 column 23>
        Consumed token: <<LITERAL_NUMBER>: "0" at line 11 column 24>
        Consumed token: <"]" at line 11 column 25>
      Return: Triple
      Consumed token: <")" at line 11 column 26>
    Return: ExportToGnuplot
    Consumed token: <";" at line 11 column 27>
  Return: Command
  Consumed token: <<EOF> at line 12 column 1>
Return: parse
```