```
jordansun@Jordans-MBP ~ % pip3 install pyang plantuml
DEPRECATION: Configuring installation scheme with distutils config files is deprecated and will no longer work in the near future. If you are using a Homebrew or Linuxbrew Python, please see discussion
at https://github.com/Homebrew/homebrew-core/issues/76621
Collecting pyang
  Downloading pyang-2.5.3-py2.py3-none-any.whl (592 kB)
     |████████████████████████████████| 592 kB 2.7 MB/s
Collecting plantuml
  Downloading plantuml-0.3.0-py3-none-any.whl (5.8 kB)
Collecting lxml
  Downloading lxml-4.8.0.tar.gz (3.2 MB)
     |████████████████████████████████| 3.2 MB 2.7 MB/s
  Preparing metadata (setup.py) ... done
Requirement already satisfied: httplib2 in /opt/homebrew/lib/python3.9/site-packages (from plantuml) (0.20.4)
Requirement already satisfied: pyparsing!=3.0.0,!=3.0.1,!=3.0.2,!=3.0.3,<4,>=2.4.2 in /opt/homebrew/lib/python3.9/site-packages (from httplib2->plantuml) (3.0.7)
Building wheels for collected packages: lxml
  Building wheel for lxml (setup.py) ... done
  Created wheel for lxml: filename=lxml-4.8.0-cp39-cp39-macosx_12_0_arm64.whl size=1496170 sha256=54dafb8c77bf157ab7e559321b001b923f9737b92437b19feef54ece1e6fa881
  Stored in directory: /Users/jordansun/Library/Caches/pip/wheels/16/8f/83/00db00dbf8e5bf5794152a315e21beec1e43fb55c884454a89
Successfully built lxml
Installing collected packages: lxml, pyang, plantuml
  DEPRECATION: Configuring installation scheme with distutils config files is deprecated and will no longer work in the near future. If you are using a Homebrew or Linuxbrew Python, please see discussio
n at https://github.com/Homebrew/homebrew-core/issues/76621
  DEPRECATION: Configuring installation scheme with distutils config files is deprecated and will no longer work in the near future. If you are using a Homebrew or Linuxbrew Python, please see discussio
n at https://github.com/Homebrew/homebrew-core/issues/76621
DEPRECATION: Configuring installation scheme with distutils config files is deprecated and will no longer work in the near future. If you are using a Homebrew or Linuxbrew Python, please see discussion
at https://github.com/Homebrew/homebrew-core/issues/76621
Successfully installed lxml-4.8.0 plantuml-0.3.0 pyang-2.5.3
WARNING: You are using pip version 21.3.1; however, version 22.0.4 is available.
You should consider upgrading via the '/opt/homebrew/opt/python@3.9/bin/python3.9 -m pip install --upgrade pip' command.
jordansun@Jordans-MBP ~ % cd Desktop
jordansun@Jordans-MBP Desktop % cd DesignVI
jordansun@Jordans-MBP DesignVI % cp ~Desktop/github/iot/lesson9/intrusiondetection.yang ~/demo
zsh: no such user or named directory: Desktop
jordansun@Jordans-MBP DesignVI % cp ~/Desktop/github/iot/lesson9/intrusiondetection.yang ~/demo
jordansun@Jordans-MBP DesignVI % cd ~/demo
jordansun@Jordans-MBP demo %
```

```
jordansun@Jordans-MBP demo % cat intrusiondetection.yang
module intrusiondetection {

 namespace "http://netconfcentral.org/ns/intrusiondetection";

 prefix "intrusion";

 description
  "YANG module for Intrusion Detection IoT system";

 revision 2014-07-15 {
  description "Intrusion Detection System";
 }

 grouping room {
  leaf doorsensorID {
   type string;
   description
    "ID of door sensor in the room";
  }
  leaf motionsensorID {
   type string;
   description
    "ID of motion sensor in the room";
  }
 }

 container intrusiondetection {
  presence
   "Indicates the service is available";

  description
   "Top-level container for all system objects.";

  leaf systemID {
   type string;
   config false;
   mandatory true;
```

```
  leaf systemLocation {
   type string;
   config false;
   mandatory true;
   description
   "The location of the system";
  }

  leaf systemStatus {
   type enumeration {
    enum up {
    value 1;
    description
     "This is powered up";
    }
    enum down {
    value 2;
    description
     "This is powered down";
    }
    enum armed {
    value 3;
    description
     "This is armed";
    }
    enum disarmed {
    value 4;
    description
     "This is disarmed";
    }
   }
   config false;
   mandatory true;
   description
   "This variable indicates the current state of
    the system.";
  }
    container sensors {
   uses room;
   config false;
  }
 }

 rpc arm-system {
  description
   "Arm the system";
 }

 rpc disarm-system {
  description
   "Disarm the system";
 }

 notification systemArmed {
```

```
 notification systemArmed {
  description
   "Indicates that system has been armed.";

  leaf armStatus {
   description
    "Indicates the system arming status";

   type enumeration {
    enum armed {
    description
     "The system was armed.";
    }

    enum disarmed {
    description
     "The system was disarmed.";
    }

    enum error {
    description
     "The system is broken.";
    }
   }
  }
 }
}
jordansun@Jordans-MBP demo %
```

```
jordansun@Jordans-MBP demo % pyang -f yin -o intrusiondetection.yin intrusiondetection.yang
jordansun@Jordans-MBP demo % cat intrusiondetection.yin
<?xml version="1.0" encoding="UTF-8"?>
<module name="intrusiondetection"
        xmlns="urn:ietf:params:xml:ns:yang:yin:1"
        xmlns:intrusion="http://netconfcentral.org/ns/intrusiondetection">
  <namespace uri="http://netconfcentral.org/ns/intrusiondetection"/>
  <prefix value="intrusion"/>
  <description>
    <text>YANG module for Intrusion Detection IoT system</text>
  </description>
  <revision date="2014-07-15">
    <description>
      <text>Intrusion Detection System</text>
    </description>
  </revision>
  <grouping name="room">
    <leaf name="doorsensorID">
      <type name="string"/>
      <description>
        <text>ID of door sensor in the room</text>
      </description>
    </leaf>
    <leaf name="motionsensorID">
      <type name="string"/>
      <description>
        <text>ID of motion sensor in the room</text>
      </description>
    </leaf>
  </grouping>
  <container name="intrusiondetection">
    <presence value="Indicates the service is available"/>
    <description>
      <text>Top-level container for all system objects.</text>
    </description>
    <leaf name="systemID">
      <type name="string"/>
      <config value="false"/>
      <mandatory value="true"/>
      <description>
        <text>ID of the system</text>
      </description>
    </leaf>
    <leaf name="systemLocation">
      <type name="string"/>
      <config value="false"/>
      <mandatory value="true"/>
      <description>
        <text>The location of the system</text>
      </description>
    </leaf>
    <leaf name="systemStatus">
      <type name="enumeration">
        <enum name="up">
```

```
          <value value="1"/>
          <description>
            <text>This is powered up</text>
          </description>
        </enum>
        <enum name="down">
          <value value="2"/>
          <description>
            <text>This is powered down</text>
          </description>
        </enum>
        <enum name="armed">
          <value value="3"/>
          <description>
            <text>This is armed</text>
          </description>
        </enum>
        <enum name="disarmed">
          <value value="4"/>
          <description>
            <text>This is disarmed</text>
          </description>
        </enum>
      </type>
      <config value="false"/>
      <mandatory value="true"/>
      <description>
        <text>This variable indicates the current state of
the system.</text>
      </description>
    </leaf>
    <container name="sensors">
      <uses name="room"/>
      <config value="false"/>
    </container>
  </container>
  <rpc name="arm-system">
    <description>
      <text>Arm the system</text>
    </description>
  </rpc>
  <rpc name="disarm-system">
    <description>
      <text>Disarm the system</text>
    </description>
  </rpc>
  <notification name="systemArmed">
    <description>
      <text>Indicates that system has been armed.</text>
    </description>
    <leaf name="armStatus">
      <description>
        <text>Indicates the system arming status</text>
      </description>
```

```
        <text>This variable indicates the current state of
the system.</text>
      </description>
    </leaf>
    <container name="sensors">
      <uses name="room"/>
      <config value="false"/>
    </container>
  </container>
  <rpc name="arm-system">
    <description>
      <text>Arm the system</text>
    </description>
  </rpc>
  <rpc name="disarm-system">
    <description>
      <text>Disarm the system</text>
    </description>
  </rpc>
  <notification name="systemArmed">
    <description>
      <text>Indicates that system has been armed.</text>
    </description>
    <leaf name="armStatus">
      <description>
        <text>Indicates the system arming status</text>
      </description>
      <type name="enumeration">
        <enum name="armed">
          <description>
            <text>The system was armed.</text>
          </description>
        </enum>
        <enum name="disarmed">
          <description>
            <text>The system was disarmed.</text>
          </description>
        </enum>
        <enum name="error">
          <description>
            <text>The system is broken.</text>
          </description>
        </enum>
      </type>
    </leaf>
  </notification>
</module>
jordansun@Jordans-MBP demo %
```

```
jordansun@Jordans-MBP demo % pyang -f uml -o intrusiondetection.uml intrusiondetection.yang --uml-no=stereotypes,annotation,typedef
jordansun@Jordans-MBP demo % cat intrusiondetection.uml
'Download plantuml from http://plantuml.sourceforge.net/
'Generate png with java -jar plantuml.jar <file>
'Output in img/<module>.png
'If Java spits out memory error increase heap size with java -Xmx1024m  -jar plantuml.jar <file>
@startuml img/intrusiondetection.png
hide empty fields
hide empty methods
hide <<case>> circle
hide <<augment>> circle
hide <<choice>> circle
hide <<leafref>> stereotype
hide <<leafref>> circle
hide stereotypes
page 1x1
Title intrusiondetection
package "intrusion:intrusiondetection" as intrusion_intrusiondetection {
class "intrusiondetection" as intrusiondetection << (M, #33CCFF) module>>
class "room" as intrusiondetection_I_room_grouping <<(G,Lime) grouping>>
intrusiondetection_I_room_grouping : doorsensorID : string
intrusiondetection_I_room_grouping : motionsensorID : string
class "intrusiondetection" as  intrusiondetection_I_intrusiondetection <<container>>
intrusiondetection *-- "0..1" intrusiondetection_I_intrusiondetection
intrusiondetection_I_intrusiondetection : systemID : string   {mandatory} {Config : false}
intrusiondetection_I_intrusiondetection : systemLocation : string   {mandatory} {Config : false}
intrusiondetection_I_intrusiondetection : systemStatus : enumeration : {up,down,armed,...}   {mandatory} {Config : false}
class "sensors" as  intrusiondetection_I_intrusiondetection_I_sensors <<container>>
intrusiondetection_I_intrusiondetection *-- "1" intrusiondetection_I_intrusiondetection_I_sensors
intrusiondetection_I_intrusiondetection_I_sensors : room {uses}
intrusiondetection : arm-system()
intrusiondetection : disarm-system()
class "systemArmed" as intrusiondetection_I_systemArmed << (N,#00D1B2) notification>>
intrusiondetection -- intrusiondetection_I_systemArmed : notification
intrusiondetection_I_systemArmed : armStatus : enumeration : {armed,disarmed,error,}
}

intrusiondetection_I_intrusiondetection_I_sensors --> intrusiondetection_I_room_grouping : uses
center footer
 <size:20> UML Generated : 2022-04-09 20:29 </size>
 endfooter
@enduml
jordansun@Jordans-MBP demo %
```

```
jordansun@Jordans-MBP demo % python3 -m plantuml intrusiondetection.uml
[{'filename': 'intrusiondetection.uml', 'gen_success': True}]
jordansun@Jordans-MBP demo %
```