

Programming Assignment 3

Due November 21 at 11:55 PM

XYZ Inc. wants to expand the utility from the previous programming assignment so that it can now read in both the old netlist files and the xml netlist files. Open source XML parsers are widely available and should be used to implement this assignment. You will not need to worry about DTDs or validation of the xml file. The XML parser should be in either C or C++. You may write your own XML parser, but it is **STRONGLY ADVISED** that you **DO NOT!** Some open source XML parsers that you may look into are:

Xerces-C++ available at <http://xml.apache.org/xerces-c/>

Expat XML Parser available at <http://expat.sourceforge.net/>

XML for C++ parser available at <http://www.alphaworks.ibm.com/tech/xml4c>

This assignment can be broken up into three parts to achieve the final program:

1. Familiarize yourself with the XML terminology. Locate an open source XML parser, and familiarize yourself with its interface. Get the parser to compile and write a simple program to parse XML files.
2. Modify your program from assignment 2 so that it can determine which type of file to open. Restructure your code so that you will be able to read in the XML files.
3. Integrate the XML parser into your program, and modify it so that it can open either the XML or .net files.

The program will retain all of the functionality of programming assignment 2. If the file extension is .xml parse it as an xml file, otherwise assume it is the original .net file format. All the options are the same as the previous assignment except the -C (convert netlist) option will work as follows.

If the input file is a .net file, convert it to an XML file as in PA2.

If the input file is a .xml file, convert it to a .net file and output to stdout:

```
Netlist <filename> converted to .net and saved in <output filename>.
```

XML Netlist File Format

The XML Netlist files have a NETLIST element at the highest level. The NETLIST elements can have COMPONENT and NET subelements. The COMPONENT elements have DESIGNATION, FOOTPRINT, and LABEL attributes. The NET elements have a single attribute: NAME. The NET elements have CONNECTION subelements. The CONNECTION elements have a single attribute: COMPONENT, and PIN subelements. The PIN elements have no attributes and the text is the pin number. See the example below. Component designations may not be listed more than once in the net.

```
<NETLIST>
  <COMPONENT DESIGNATION="COMPONENT DESIGNATION"
    FOOTPRINT="FOOTPRINT" LABEL="LABEL"/>
  ...
  <NET NAME="NET NAME">
    <CONNECTION COMPONENT="COMPONENT DESIGNATION">
      <PIN>PinNumber1</PIN>
      <PIN>PinNumber2</PIN>
      ...
    </CONNECTION>
  </NET>
  ...
</NETLIST>
```