Programming Assignment 1

Due October 17 at 11:55 PM

You work for XYZ Inc., a company that specializes in circuit layout software. XYZ has recently laid off a few of their programmers and you are to take over the project of one of those programmers that was laid off. The programmer was working on a utility that would read in a netlist file from a competitor's software program. This utility must be written in C using the files that are provided. The provided files are those that the previous programmer was working on before being laid off, and therefore you should not assume that they are bug free. The utility syntax is netlist [option] filename. This utility should read in the file and have the behavior as defined by the option.

-d (quick display option)
Component count: **XXX**
Footprint count: **XXX**
Unique component count: **XXX**
Net count: **XXX**
Largest net: **XXX** with **XXX** connections

-n (no connection option)
Component **XXX** is not connected on pin(s) **XXX**

-s (net shorted list)
Net **XXX** and **XXX** are shorted through component **XXX** on pin **XXX**

-c (component assembly info)
XXX of component **XXX** in **XXX** footprint.
…

The quick display option will display the number of components, the number of unique footprints, the number of unique components, the number of netlists and the largest netlist. Those components that have the same footprint and label are the same type; the unique components are those that have either a different label or footprint.

The no connection option will display those pins on components that are not connected. The largest pin number in the netlist file is assumed to be the number of pins on a component.

The shorted net will list two nets that are shorted together through a component pin. Sometimes the competitors software does not recognize that two nets have been connected through a pin and output them as two separate nets.

The component assembly info is useful for those assembling a board. It will display the number of each unique component that are needed for the netlist.

File Format
The file is in plain ASCII and lists the components followed by the nets.
Components start with the [with each line having a separate element of information.
Components are terminated with the] symbol.
[
Designation
Footprint
Label
Unused 1
Unused 2
Unused 3
]

Nets start with the (symbol with each line having a separate connection. Each connection is specified with the component name – pin number. The net is ended with the) symbol.
(
Name
Component-Pin
…
)

File Format Example:

```
[
Op-amp
Dip 8
Dual Op-amp


]
[
Connector
DB9
DB9


]
(
12V
Connector-1
Op-amp-1
)
(
GND
Connector-2
Op-amp-8
)
(
Plus
Connector-3
Op-amp-2
)
(
Minus
Connector-4
Op-amp-3
)
(
Output
Connector-5
Op-amp-5
)
```