

OVERVIEW

Your program should take lines of text input (each containing one of five commands: `DEPEND`, `INSTALL`, `REMOVE`, `LIST`, `END`); after reading each line you will need to echo the input and possibly output further line(s) of text, as described in the “command list” below.

The primary idea in this program is to keep track of various dependencies; if, for example, an input line is `INSTALL A` and you know that **A** depends on **B** (from an earlier line like `DEPEND A B`, perhaps), then—if **B** is not yet installed—**B** must be installed before installing **A**. (See the descriptions in the “command list” for further details.)

Note that when *removing* an item, the items on which that item depends should also be removed if *and only if* nothing else depends on them *and* those items were not explicitly installed—e.g., if **B** is installed as part of the installation of **A** (as in the previous paragraph), then once all the items that depend on **B** are removed, **B** will be removed.

COMMAND LIST

The commands below are described in one paragraph each, formatted in four small sections; specifically:

- Command syntax
- Description of command
- `Output`
- `Description of output`

- `DEPEND A B [C ...]`
- Have **A** depend on **B** (and **C** ...)
- `DEPEND A B [C ...]`
- `Simply repeat the input line.`

- `INSTALL A`
- Install **A** and all items on which it depends.
- `INSTALL A`

```
[...]  
[Installing B]  
Installing A | A is already installed
```

- If **A** is already installed, simply print `A is already installed`. Otherwise, if **A** does not depend on any uninstalled items, simply print `Installing A`. Otherwise, print lines to install everything that **A** still needs (as well as **A**). Note that *those items* might also have dependencies, and so on. Also note that you need only print the single line of text for each item installed—you don't really install anything!

- `REMOVE A`
- Remove **A** and all items on which it depends if they aren't needed by anything else.
- `REMOVE A`

```
Removing A | A is still needed | A is not installed  
[Removing B]  
[...]
```

- If **A** is not installed, simply print `A is not installed`. Otherwise, if **A** is still needed by something, simply print `A is still needed`. Otherwise, print `Removing A` and then print lines to remove every other item that was installed because of a dependency on it—rather than being explicitly installed—that also no longer has anything dependant upon it. Note that *those items* might have items on which they depended that then are no longer needed... Also, note that an item that was explicitly installed should *never* be removed as a dependency of some other item.

- `LIST`
- List all installed items.
- `LIST`

```
[A]
[...]
```

- A list of all installed items, each on its own line. Order does not matter.
- `END`
- End the input file (this should appear exactly once—as the last line of the input).
- `END`
- Simply repeat the input line.

SAMPLE INPUT

```
DEPEND TELNET TCPIP NETCARD
DEPEND TCPIP NETCARD
DEPEND DNS TCPIP NETCARD
DEPEND BROWSER TCPIP HTML
INSTALL NETCARD
INSTALL TELNET
INSTALL foo
REMOVE NETCARD
INSTALL BROWSER
INSTALL DNS
LIST
REMOVE TELNET
REMOVE NETCARD
REMOVE DNS
REMOVE NETCARD
INSTALL NETCARD
REMOVE TCPIP
REMOVE BROWSER
REMOVE TCPIP
LIST
END
```

OUTPUT FOR SAMPLE INPUT

```
DEPEND TELNET TCPIP NETCARD
DEPEND TCPIP NETCARD
DEPEND DNS TCPIP NETCARD
DEPEND BROWSER TCPIP HTML
```

```
INSTALL NETCARD
    Installing NETCARD
INSTALL TELNET
    Installing TCPIP
    Installing TELNET
INSTALL foo
    Installing foo
REMOVE NETCARD
    NETCARD is still needed
INSTALL BROWSER
    Installing HTML
    Installing BROWSER
INSTALL DNS
    Installing DNS
LIST
    NETCARD
    TCPIP
    TELNET
    foo
    HTML
    BROWSER
    DNS
REMOVE TELNET
    Removing TELNET
REMOVE NETCARD
    NETCARD is still needed
REMOVE DNS
    Removing DNS
REMOVE NETCARD
    NETCARD is still needed
INSTALL NETCARD
    NETCARD is already installed
REMOVE TCPIP
    TCPIP is still needed
REMOVE BROWSER
    Removing BROWSER
    Removing HTML
    Removing TCPIP
REMOVE TCPIP
    TCPIP is not installed
LIST
    NETCARD
    foo
END
```