☆ Aloha 1 - Java Project

Components of computer systems often have dependencies (i.e., other components that must be installed before the systems function properly). These dependencies are frequently shared by multiple components. For example, both the TELNET client program and the FTP client program require that the TCP/IP networking software be installed before they can operate. If you install TCP/IP and the TELNET client program, and later decide to add the FTP client program, you do not need to reinstall TCP/IP.

For some components, it would not be a problem if the components on which they depended were reinstalled; it would just waste some resources. For other components (e.g., TCP/IP), some component configuration may be destroyed if the component were reinstalled.

It is useful to be able to remove components that are no longer needed. When this is done, components that only support the removed component may also be removed, which frees up disk space, memory, and other resources. A supporting component that is not explicitly installed may be removed only if all components that depend on it are also removed. For example, removing the FTP client program and TCP/IP would mean the TELNET client program, which was not removed, would no longer operate. Likewise, removing TCP/IP by itself would cause the failure of both the TELNET and the FTP client programs. Also, if we installed TCP/IP to support our own development, then installed the TELNET client (which depends on TCP/IP), and then still later removed the TELNET client, we would not want TCP/IP to be removed.

Dependence is transitive. For example, if A depends on B, and B depends on C, both B and C are implicitly installed when A is explicitly installed. Conversely, B and C would both be removed if A is subsequently removed. We need a program to automate the process of adding and removing components. To do this, we will maintain a record of installed components and component dependencies. A component can be installed explicitly in response to a command (unless it has already been explicitly installed), or implicitly if it is needed by some other component being installed. A component can be explicitly removed in response to a command (if it is not needed to support other components) or implicitly removed if it is no longer needed to support another component (and has not been explicitly installed).

1. Input

appear in uppercase starting in column one. Item names are separated from the command name and each other by one or more spaces. All appropriate **DEPEND** commands will appear before the occurrence of any **INSTALL** dependencies. The end of the input is marked by a line that contains only the word **END**.

Command Syntax	Interpretation/Response
DEPEND item1 item2 [item3...]	**item1** depends on **item2** (and **item3** ...)
INSTALL item1	install **item1** and those on which it depends
REMOVE item1	remove **item1**, and those on which it depends, if possible
LIST	list the names of all currently-installed components

2. Output

Echo each line of input. Follow each echoed **INSTALL** or **REMOVE** line with the actions taken in response, making certain that the actions are given in the proper order. Also identify exceptional conditions. (See Expected Output, below, for examples of all cases.) For the **LIST** command, display the names of the currently installed components. No output, except the echo, is produced for a **DEPEND** command or the line containing **END**. There will be at most one dependency list per item.

3. Sample Input

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

```
REMOVE NETCARD
REMOVE DNS
REMOVE NETCARD
INSTALL NETCARD
REMOVE TCPIP
REMOVE BROWSER
REMOVE TCPIP
LIST
END
```

4. Output for the Sample Output

```
DEPEND TELNET TCPIP NETCARD
DEPEND TCPIP NETCARD
DEPEND NETCARD TCPIP
TCPIP depends on NETCARD, ignoring command
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
```

Aloha 1 - Java Project

02 : 59
to test end

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

Java 7

```
dependency
  src
    test
      java
        com
          salesforce
            tests
              dependenc
                YourUni
                BaseTes
                SampleI
    main
  pom.xml
```

```
1  package
   com.salesforce.tests.dependency;
2
3  /**
4   * Place holder for your unit tests
5   */
6  public class YourUnitTest {
7
8
9  }
10
```

Line: 1 Col: 1

Execute main() | Run Unit Tests | Submit & Continue