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Artificial Cognitive Systems – Assignment

About the Expert System Toolkit …

The expert system toolkit which I chose for the assignment is called e2gLite[1] which is a free java implementation containing the basic features of an expert system shell integrated with a web front end supporting java applets.

In order to implement a sample expert system using e2gLite we have to do the following.

We need to download **e2glite.jar**[2] from the e2gLite website.

Create an html web page (e.g. **troubleshoot.html**) in the same folder where **e2glite.jar** file resides.

Insert the following html code to the html web page (**troubleshoot.html**).

```
<HTML>
<HEAD><TITLE>PC Trouble Shooter</TITLE></HEAD>
<BODY>
  <CENTER>
  <APPLET CODE="e2glite.e2g.class" ARCHIVE="e2glite.jar" WIDTH=600 HEIGHT=450>
    <PARAM NAME="KBURL" VALUE="troubleshoot.kb">
    <PARAM NAME="DEBUG" VALUE="true">
    <PARAM NAME="APPTITLE" VALUE="PC Trouble Shooter - Demo Version">
    <PARAM NAME="APPSUBTITLE" VALUE="by PC Service">
    <PARAM NAME="TITLECOLOR" VALUE="#FF0000">
    <PARAM NAME="PROMPTCOLOR" VALUE="#FF0000">
    <PARAM NAME="BGCOLOR" VALUE="#00FFFF">
    <PARAM NAME="STARTBUTTON" VALUE="Start Troubleshooting">
    Java is required to view this page!
  </APPLET>
  </CENTER>
</BODY>
</HTML>
```

Our knowledge base is provided to the e2glite expert system shell in the form of text file (in this case **troubleshoot.kb**).

We can specify the knowledge base using rules of the following form;
If <condition(s)> Then <conclusion>

Further we can include **prompts** in order to get the input from the end-user to satisfy and validate the condition(s) in the rules specified in the knowledge base and come up with a final conclusion.

My attempt was to build an expert system, by referring to some of the documentation found in windows trouble shooting which comes with windows help. So I considered certain troubleshooting scenarios related with printers and Ethernet network card, when creating the following knowledge base which was provided to e2gLite expert system shell in the form of a text file "**troubleshoot.kb**".

REM Trouble-shooting knowledge base (troubleshoot.kb)

RULE [Failure in network hardware connection]
If [problem] = "cannot access internet" and
[network_connection] = "PC network port is not blinking"
Then **[recommendation] = "Please try connecting your network cable with another LAN port"**

RULE [Failure in network software configuration]
If [problem] = "cannot access internet" and
[network_connection] = "PC network port is blinking"
Then **[recommendation] = "please check the proxy settings of your browser."**

RULE [Printer requires vendor specific drivers although detected by windows]
If [printer_configuration] = "printer is not configured" and
[printer_detection] = "printer is detected by default windows drivers"
Then **[recommendation] = "try installing vendor specific drivers"**

RULE [Vendor specific drivers for the printer are not working]
If [printer_configuration] = "printer is not configured" and
[printer_detection] = "printer is detected by vendor specific drivers"
Then **[recommendation] = "Try reinstalling vendor specific printer drivers and consult the vendor of your printer."**

RULE [Printer is not working although it is properly plugged in]
If [printer_error] = "printer malfunction" and
[power_for_printer] = "printer power button indicates switched on"
Then [printer_configuration] = "printer is not configured"

RULE [Printer is not working because it is not properly plugged in]
If [printer_error] = "printer malfunction" and
[power_for_printer] = "printer power button is switched off"
Then **[recommendation] = "please make sure your printer is properly plugged in"**

RULE [Printer is not working due to bad cartridge]
If [printer_error] = "printing a blank page" and
[cartridge_level] = "cartridge is old"
Then **[recommendation] = "please refill or install a new cartridge"**

RULE [Printer is not working although a new cartridge is installed]
If [printer_error] = "printing a blank page" and
[cartridge_level] = "cartridge is new"
Then [printer_configuration] = "printer is not configured"

RULE [Printer is printing a blank page]
If [problem] = "unable to take a printout" and
[printer_observation] = "printing a blank page"
Then [printer_error] = "printing a blank page"

RULE [Printer cannot be used]
If [problem] = "unable to take a printout" and
[printer_observation] = "cannot make it print anything"
Then [printer_error] = "printer malfunction"

PROMPT [problem] MultChoice
"What is the problem with your computer ?"
"unable to take a printout"
"cannot access internet"

PROMPT [printer_observation] MultChoice
"What is wrong with your printer ?"
"printing a blank page"
"cannot make it print anything"

PROMPT [cartridge_level] MultChoice CF
"What is the status of the cartridge ?"
"cartridge is old"
"cartridge is new"

PROMPT [power_for_printer] MultChoice

"What is the status of power supply for the printer? "

"printer power button is switched off"

"printer power button indicates switched on"

PROMPT [printer_detection] MultChoice CF

"Are the relevant drivers installed in your machine? "

"printer is detected by default windows drivers"

"printer is detected by vendor specific drivers"

PROMPT [network_connection] MultChoice

"What is the status of your PC network port? "

"PC network port is blinking"

"PC network port is not blinking"

GOAL [recommendation]

References

[1] Building and Using Expert Systems: a Mini-Course Introducing the e2gLite Expert System Shell-
http://expertise2go.com/webesie/e2gdoc/
Last viewed on: 11th December 2009
[2] Downloading e2gLite - http://expertise2go.com/webesie/e2gdoc/e2gmod2.htm
Last viewed on: 11th December 2009