

PROGRAMS

BBC Logic Tree

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'Logic Tree' is a program for either model BBC. Presented loosely in the form of a simple game, it allows the user to gradually build up a binary tree (refer to a Basic textbook if you are unfamiliar with the concept). It is likely to prove a useful teaching aid in that it demonstrates how a tree is formed and the way in which it is used.

To use the program for the first time, you will need to input a subject. This can be anything you like, but it is best to stick to concrete nouns when using the program with young children. You then enter examples, supplying answers to the com-

puter's questions as you go. The tree will carry out a search following each additional branch and request further details if the search fails.

The syntax requires attributes rather than properties of objects, since the questions asked are based on 'Can the object...?' rather than 'Is the object...?', but this is easily changed if required. Once a tree is complete, it may be saved on disk for future use. Function key 0 prints the array holding the data so that you are able to see how the tree is structured.

```
10REM TREE STRUCTURE GAME
20 *****
30
40MDE7
50PROCinit
60REPEAT
70PROCsearch_tree
80PROCend_of_tree
90PROCanother_go
100UNTILFALSE
110 DEFPROCinit
120 *****
130
140DN ERROR GOTO2760
150REM disable escape
160*FX220,0
170REM this shows how the tree is built up (after leaving prog use f0)
180*KEYOF.I=1TO10:P.TREE$(I,1);" ";TREE$(I,2);" ";TREE$(I,3):N.I:M
190DIM TREE$(100,3)
200REM lower case
210*FX202,48
220REM set VDU7 duration (FX213 sets pitch)
230*FX214,1
240REM assign colours eg r=RED
250r=129
260g=130
270y=131
280m=133
290b=134
300num=1
310newnum=1
320type$="TREE GAME"
330PROCheader
340PROCinstruct
350CLS
360PRINT
370PROCprint(b,"Shall I load the file you saved last time?")
380PROCyes_no
390CLS
400PROCoff
410IF ans PROCload_datafile ELSE PROCfirst_data
420PROCoff
430PROCdelay(60)
440PRINT``CHR#g;"Here we go....."
450PROCdelay(200)
460PROCon
470PROCheader
480ENDPROC
490 DEFPROCfirst_data
500 *****
510
520PRINT
530PROCprint(0,"DK. I will ask you some questions to start a new tree.")
540PROCdelay(200)
550PRINT``CHR#g;"Here we go....."
560PROCdelay(200)
570CLS
580PROCon
590PRINT
600PROCprint(b,"What tree do your objects belong to?")
610PRINT
620PROCtext_col(y)
630INPUT"They are from the tree of "type$
640IF RIGHT$(type$,1)="s" type$=LEFT$(type$,LEN(type$)-1)
650PRINT
660PROCprint(b,"What shall I ask you first about the "+type$+"?")
670PRINT
680PROCprint(y,"Ask me if the "+type$+" can ")
690INPUT""TREE$(1,1)
700PRINT
710PROCprint(b,"If the "+type$+" could "+TREE$(1,num)+" what type of
  might it be?")
720PRINT
730PROCtext_col(y)
740INPUT"It might be "TREE$(1,2)
750PRINT
760PROCprint(b,"If the "+type$+" could not "+TREE$(1,num)+" what type of
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" +type$+" might it be?")
770PRINT
780PROCtext_col(y)
790INPUT "It might be "TREE$(1,3)
800next=2
810ENDPROC
820 DEFPROCsearch_tree
830 *****
840
850CLS
860pos=-1
870REPEAT
880pos=pos+1
890num=newnum
900PROCtext_col(b)
910PRINTTAB(0,pos)"Does the ";type$;" you are thinking of
" `TREE$(num,1);"?"
920PROCyes_no
930IF ans reply=2 ELSE reply=3
940newnum=ASC(TREE$(num,reply))-48
950PRINTTAB(0,pos);SPC38
960PRINTTAB(0,pos);CHR$m;TREE$(num,1);
970IF reply=2 PRINTTAB(25)CHR#g"yes";SPC12 ELSE PRINTTAB(30)CHR$r"no";SPC8
980UNTIL newnum>next
990ENDPROC
1000 DEFPROCend_of_tree
1010 *****
1020
1030PROCprint(0,CHR$11+"Are you thinking of "+TREE$(num,reply)+"?")
1040PROCyes_no
1050IF ans PRINTCHR#g"yes":PROCi_won ELSE PRINTCHR$r"no":PROCupdate_tree
1060newnum=1
1070ENDPROC
1080 DEFPROCupdate_tree
1090 *****
1100
1110TEMP$=TREE$(num,reply)
1120PRINT `CHR$(r)SPC14"OK, you win."
1130FORI=5 TO 2 STEP-1
1140FORJ=150TO0 STEP-25
1150SOUND17,-(I+10),J+SIN(I^I),I
1160NEXT,
1170PRINT "What were you thinking of?"
1180PROCtext_col(y)
1190INPUT "I was thinking of "newtype$
1200PROCprint(b,"What question would differentiate between
"+newtype$+" and "+ TREE$(num,reply)+"?" +CHR$10+CHR$13)
1210PROCtext_col(y)
1220INPUT "Does it "act$
1230IF RIGHT$(act$,1)="? " act$=LEFT$(act$,LEN(act$)-1)
1240TREE$(next,1)=act$
1250PROCprint(b,"What is the correct answer for "+newtype$+"?")
1260IF POS>36 PRINT
1270TEMP$=TREE$(num,reply)
1280TREE$(num,reply)=STR$(next)
1290PROCyes_no
1300IF ans PRINTCHR$y"yes": reply=2 ELSE PRINTCHR$y"no":reply=3
1310TREE$(next,reply)=newtype$
1320IF reply=2 reply=3 ELSE reply=2
1330TREE$(next,reply)=TEMP$
1340next=next+1
1350newnum=1
1360PROCoff
1370PROCprint(0,"I know "+STR$(next-1)+" "+type$+"s now")
1380PRINT
1390PROCdelay(100)
1400PROCcon
1410ENDPROC
1420 DEFPROCyes_no
1430 *****
1440
1450*FX21,0
1460REPEAT
1470ans=GET OR &20
1480UNTIL ans=121 OR ans=110
1490IF ans=121 ans=TRUE ELSE ans=FALSE
1500IF ans THEN *FX213,250
1510IF NOT ans THEN *FX213,50
1520VDU7
1530ENDPROC
1540 DEFPROCi_won
1550 *****
1560
1570PRINT `CHR$136CHR$(g)TAB(16)"I WDN!"
1580FORI=5TO 2 STEP-1
1590FORJ=1TO6
1600SOUND17,-(I+10),150*SIN(I^I),I
1610NEXT,
1620PRINT
1630ENDPROC
1640 DEFPROCanother_go
1650 *****
1660
1670PRINT "Do you want another go?";
1680PROCyes_no
1690IF ans ENDPROC
1700REM reset
1710*FX202,32
1720*FX220,27
1730*FX213,100
1740*FX214,6
1750CLS
1760PROCprint(b,CHR$10+"Thanks for playing.")
1770PRINT `
1780PROCprint(0,"Do you want to save the information about "+type$+"s?")
1790PROCyes_no
1800IF NOT ans VDU26,12:PRINTCHR$b"Bye":END
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```
1810file=OPENOUT("$.TREEDAT")
1820PRINT#file,type$,next
1830FOR I=1 TO next-1
1840PRINT#file,TREE$(I,1),TREE$(I,2),TREE$(I,3)
1850NEXT
1860CLOSE#0
1870VDU26,12
1880PRINTCHR#b"Bye"
1890END
1900 DEFPROCload_datafile
1910 *****
1920
1930file=OPENIN("$.TREEDAT")
1940INPUT#file,type$,next
1950FOR I=1TO next-1
1960INPUT#file,TREE$(I,1),TREE$(I,2),TREE$(I,3)
1970NEXT
1980CLOSE#0
1990PROCprint(0,CHR$10+"I have loaded the information from the file")
2000PROCdelay(100)
2010PRINT`
2020PROCprint(0,"I know "+STR$(next-1)+" "+type$+"s")
2030PROCdelay(100)
2040PROCcon
2050ENDPROC
2060 DEFPROCdelay(t)
2070 *****
2080wait=INKEY(t)
2090ENDPROC
2100 DEFPROCcuff
2110 *****
2120VDU23,1,0;0;0;0;
2130ENDPROC
2140 DEFPROCcon
2150 *****
2160VDU23,1,1;0;0;0;
2170ENDPROC
2180 DEFPROCinstruct
2190 *****
2200
2210PRINT
2220PROCprint(b,"Do you want instructions for the game?")
2230PROCyes_no
2240IF NOT ans ENDPROC
2250CLS
2260PROCcuff
2270PRINT
2280PROCprint(0,"You will be asked if you want to load a file containing
information about the tree or answer questions to start a new tree.")
2290PROCdelay(600)
2300PRINT`
2310PRINT"A type of tree might be"
2320PROCdelay(50)
2330PRINTTAB(5)CHR$y"animals`"
2340PROCdelay(250)
2350PRINT"The first question may be"
2360PROCdelay(50)
2370PRINTTAB(5)CHR$y"does it walk`."
2380PROCdelay(250)
2390PRINT`"I will ask questions in blue writing."
2400PROCdelay(50)
2410PROCprint(y,"Your replies will be in yellow.")
2420PROCdelay(700)
2430PRINT`CHR#g;"Here we go....."
2440PROCdelay(400)
2450PROCcon
2460ENDPROC
2470 DEFPROCtext_col(c)
2480 *****
2490REM poke colour outside text window
2500FORI=&7C7B+VPOS*40 TO &7FC0STEP&2B
2510?I=c
2520NEXT
2530ENDPROC
2540 DEFPROCheader
2550 *****
2560VDU26
2570CLS
2580FORI=1TO2
2590PRINTCHR$(y)CHR$157CHR$132CHR$141SPC((34-LEN(type$))/2);type$
2600NEXT
2610REM text window to leave first col'm blank
2620VDU28,1,24,39,3
2630ENDPROC
2640 DEFPROCprint(col,A$)
2650 *****
2660
2670IF col PROCtext_col(col)
2680IF LEN(A$)<39 PRINTA$;:ENDPROC
2690P=39
2700REPEAT
2710P=P-1
2720UNTIL MID$(A$,P,1)="`
2730PRINT LEFT$(A$,P)
2740A$=RIGHT$(A$,LEN(A$)-P)
2750GOTO2680
2760REM ERROR ROUTINE
2770 *****
2780
2790IF ERR=129 PRINTCHR$136CHR$r"
THE FILE IS NOT ON THE DISC":PROCdelay(600):RUN
2800PRINT`"DOPS @ line ";ERL
2810REPORT
2820PRINT`
2830*FX202,32
2840*FX220,27
2850END
```