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1 DIM CN$(26410),IW$(6),TW$(6),D(162),CW(6),CT(6),T(162),C#
(12)
2 CN$="":CN$(26410)="":CN$(2)=CN$
3 FOR J=0 TO 162:T(J)=2:NEXT J
4 OPEN #1,4,0,"D:PAIRS150":REM a disk file with all the
prompt and target words
5 GOTO 100
10 FOR J=0 TO 162:D(J)=0:NEXT J
20 FOR J=1 TO LEN(IW$):CW(J)=ASC(IW$(J))-64+(J-1)*27:NEXT
J:CW(0)=LEN(IW$)*27
30 FOR J=1 TO LEN(TW$):CT(J)=ASC(TW$(J))-64+(J-1)*27:NEXT
J:CT(0)=LEN(IW$)*27
50 ? "(Activating network)";
51 FOR J=0 TO LEN(IW$):? ".":FOR I=0 TO
162:D(I)=D(I)+ASC(CN$(CW(J)*162+I+1)):NEXT I:NEXT J:?" )"
70 RETURN
100 ? :? :? "INPUT WORD, AND TARGET":INPUT (#1)IW$:INPUT
→Omit for manual input
(#1)TW$:MODE=1:IF TW$="" THEN TW$=" ":MODE=0:GOSUB 10:GOTO
200
101 IF ERROR>MERR THEN MERR=ERROR
104 ? "Word:";WORD+1;" Pass:";PASS+1:?"Errors:";ERROR;"
(Last):";HERR;" (high):";MERR:WORD=WORD+1
105 ? IW$,TW$
106 IF IW$="YELL" THEN CLOSE #1:OPEN
#1,4,0,"D:PAIRS150":PASS=PASS+1:HIGH=WORD:WORD=0:HERR=ERROR
:ERROR=0:END
110 GOSUB 10:GOTO 170
150 GOSUB 50
170 ? "(Correcting network)";FOR J=1 TO LEN(TW$)
180 IF D(CT(J))>T(CT(J)) THEN NEXT J:?")":GOTO 200
190 ? ".":FOR I=0 TO LEN(IW$):QX=CW(I)*162+CT(J)+1
193 QY=ASC(CN$(QX)):IF QY<=(T(CT(J)))/LEN(IW$) THEN
CN$(QX,QX)=CHR$(QY+1):D(CT(J))=D(CT(J))+1:ERROR=ERROR+1
195 NEXT I:GOTO 180
200 ? :? IW$;" generates:"
205 QX=0:QY=0:FOR J=1 TO LEN(TW$):QY=QY+ASC(TW$(J)):NEXT J
210 FOR J=0 TO 162:HJ=INT(J/27):LJ=J-HJ*27:IF D(J)>T(J) AND
LJ>0 THEN ? CHR$(LJ+64);:QX=QX+LJ+64
215 NEXT J
217 IF QX<>QY AND MODE=1 THEN 300
220 GOTO 100
300 ? :FOR J=0 TO 162:HJ=INT(J/27):LJ=J-HJ*27:IF D(J)>T(J)
AND LJ>0 THEN 350
310 NEXT J:?"":GOTO 170
350 QZ=0:IF LEN(TW$)>HJ THEN QZ=ASC(TW$(HJ+1))
360 IF QZ<>LJ+64 THEN T(J)=D(J):?"*";:ERRDR=ERROR+1:GOTO
310
370 ? " ":GOTO 310

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Written in Atari BASIC, for any 8-bit Atari computer with at least 64K RAM.

LISTING 1

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5 REM DEFINE VARIABLES
10 FEATURETYPES=10:NUMBEROFFEATURES=2
20 NUMBEROFNODES=(FEATURETYPES+1)*NUMBEROFFEATURES
30 DIM WEIGHTS(NUMBEROFNODES,NUMBEROFNODES),THRESHHOLD(NUMBEROFNODES),OUTPUTVALUE(NUMBEROFNODES)
40 DIM IN$(NUMBEROFFEATURES),OUT$(NUMBEROFFEATURES)
50 PROMPT=0
60 DIM CURRENTPROMPT(NUMBEROFFEATURES),CURRENTTARGET(NUMBEROFFEATURES)
70 FOR J=0 TO NUMBEROFNODES:THRESHHOLD(J)=4:FOR I=0 TO NUMBEROFNODES:WEIGHTS(I,I)=0:NEXT I:NEXT J
95 REM GET PROMPT AND TARGET
100 IN$=STR$(PROMPT):TARGET=99-(PROMPT-INT(PROMPT/10)):OUT$=STR$(TARGET)
105 ? :? :? " FUNCTION 99-(X-INT(X/10)) ":? "PROMPT:";IN$;" TARGET:";OUT$
110 PROMPTLENGTH=LEN(IN$)
120 TARGETLENGTH=LEN(OUT$)
130 FOR J=1 TO PROMPTLENGTH:CURRENTPROMPT(J)=(ASC(IN$(J))-48)+(FEATURETYPES+1)*(J-1):NEXT J
140 FOR J=1 TO TARGETLENGTH:CURRENTTARGET(J)=(ASC(OUT$(J))-48)+(FEATURETYPES+1)*(J-1):NEXT J
150 CURRENTPROMPT(0)=PROMPTLENGTH*(FEATURETYPES+1)
195 REM FEEDFORWARD ACTIVATION
200 FOR J=0 TO NUMBEROFNODES:OUTPUTVALUE(J)=0:NEXT J
210 ? "(Activating Network";:FOR J=0 TO PROMPTLENGTH:?" ";
220 FOR I=0 TO NUMBEROFNODES:OUTPUTVALUE(I)=OUTPUTVALUE(I)+WEIGHTS(CURRENTPROMPT(J),I):NEXT I:NEXT J:?" )"
295 REM INCREASE LOW WEIGHTS
300 ? "(Correcting network";:FOR J=1 TO TARGETLENGTH
310 IF OUTPUTVALUE(CURRENTTARGET(J))>THRESHHOLD(CURRENTTARGET(J)) THEN NEXT J:?" ":GOTO 400
320 ? ".":;FOR I=0 TO PROMPTLENGTH
330 IF WEIGHTS(CURRENTPROMPT(I),CURRENTTARGET(J))>THRESHHOLD(CURRENTTARGET(J))/PROMPTLENGTH THEN GOTO 350
340 WEIGHTS(CURRENTPROMPT(I),CURRENTTARGET(J))=WEIGHTS(CURRENTPROMPT(I),CURRENTTARGET(J))+1
345 OUTPUTVALUE(CURRENTTARGET(J))=OUTPUTVALUE(CURRENTTARGET(J))+1
350 NEXT I:GOTO 310
395 REM DISPLAY ACTIVATED OUTPUT
400 ? :? IN$;" generates:"
410 CHECK=0
420 FOR J=0 TO NUMBEROFNODES:HJ=INT(J/(FEATURETYPES+1)):LJ=J-HJ*(FEATURETYPES+1)
430 IF OUTPUTVALUE(J)>THRESHHOLD(J) AND LJ<=FEATURETYPES THEN ? CHR$(LJ+48);:CHECK=CHECK+1
440 NEXT J
450 IF CHECK>LEN(OUT$) THEN 500
460 GOTO 600
495 REM RAISE THRESHHOLD
500 ? :FOR J=0 TO NUMBEROFNODES:HJ=INT(J/(FEATURETYPES+1)):LJ=J-HJ*(FEATURETYPES+1)
510 IF OUTPUTVALUE(J)>THRESHHOLD(J) AND LJ<=FEATURETYPES THEN 530
520 NEXT J:?" :GOTO 200
530 QZ=0:IF TARGETLENGTH>HJ THEN QZ=ASC(OUT$(HJ+1))
540 IF QZ=LJ+48 THEN ? " ";:GOTO 520
550 THRESHHOLD(J)=OUTPUTVALUE(J):?" *":;GOTO 520
595 REM LOOP TO NEXT PROMPT/CYCLE
600 PROMPT=PROMPT+1:IF PROMPT=99 THEN PROMPT=0:CYCLE=CYCLE+1
610 GOTO 100

```

Listing 3 - a similar program to listing 1, but more explicit - this program attempts to pair stimulus #'s w/ response #'s - it readily shows the limitations of this type of connectionist scheme.

Prompt	Target	Result			
ACT	ACTED	ACTED	LEAVE	LEFT	LEOAFVTEd
ADORE	ADORED	ADORED	LIE	LIED	LIED
AMAZE	AMAZED	AMAZED	LIGHT	LIT	LIT
AMUSE	AMUSED	AMUSED	LIVE	LIVED	LIOVED
BARE	BARED	BAREDED	LOCK	LOCKED	LIOCKED
BEGIN	BEGAN	BEGAN	LOOK	LOOKED	LIOCKED
BEND	BENT	BEONUDTDED	LOVE	LOVED	LIOVED
BIND	BOUND	BONUDNDED	LUST	LUSTED	LUSTED
BLAZE	BLAZED	BLAZED	MAIL	MAILED	MAILED
BLEED	bled	bled	MARK	MARKED	MARKED
BLOW	BLEW	BLEOWED	MASK	MASKED	MASKED
BRAVE	BRAVED	BRAVED	MEAN	MEANT	MEANETD
BREAK	BROKE	BROKE	MEND	MENDED	MENDDDED
BUD	BUDDED	BUDDED	MIND	MINDED	MINDDED
BURN	BURNED	BURNED	MISS	MISSED	MISSED
BURST	BURST	BURSETD	MIX	MIXED	MIXED
BUST	BUSTED	BUSTED	MUSE	MUSED	MAUSED
CALL	CALLED	CALLED	MUTE	MUTED	MUTED
CALM	CALMED	CALMED	NAIL	NAILED	NAILED
CARE	CARED	CAOREDED	NEED	NEEDED	NEEDED
CHOKE	CHOKED	CHOKED	OPEN	OPENED	OPENED
CHOOSE	CHOSE	CHOSE	PAIR	PAIRED	PAIRED
CLOSE	CLOSED	CLOSED	PEER	PEERED	PEERED
COMB	COMBED	COMBED	PITY	PITIED	PITIED
COME	CAME	CAOME	PLAY	PLAYED	PLAYED
COOL	COOLED	COOLED	QUIT	QUIT	QUIT
COPY	COPIED	COPIED	RAGE	RAGED	RAGED
CRY	CRIED	CRIED	READ	READ	READ
CUT	CUT	CUT	REST	RESTED	RAESTED
DENY	DENIED	DENIED	RING	RANG	RANG
DIVE	DOVE	DIOVE	RISK	RISKED	RAISKED
DO	DID	DID	RUN	RAN	RAN
DRAW	DREW	DREW	RUSH	RUSHED	RUSHED
DREAM	DREAMT	DREAMT	SAY	SAID	SAIDED
EAT	ATE	ATE	SEAL	SEALED	SAEOALED
ECHO	ECHOED	ECHOED	SEE	SAW	SAEWD
EDIT	EDITED	EDITED	SEND	SENT	SAEONUDTDED
EXILE	EXILED	EXILTED	SENSE	SENSED	SENUSED
EXIT	EXITED	EXITED	SEW	SEWED	SAEWED
EYE	EYED	EYED	SHAKE	SHOOK	SHOOEKD
FALL	FELL	FELLED	SHARE	SHARED	SHAORED
FEED	FED	FEDELTED	SHINE	SHONE	SHONED
FEEEL	FELT	FELDTED	SIGH	SIGHED	SIGHED
FIRE	FIRED	FIOREDD	SIGN	SIGNED	SIGNED
FISH	FISHED	FISHED	SLEEP	SLEPT	SLEDPT
FLEE	FLED	FLEDW	SOAR	SOARED	SEOAERDED
FLOW	FLOWED	FLEOWED	SOW	SOWED	SEOWED
FLY	FLEW	FLEW	SPEAK	SPOKE	SPOKE
FOLD	FOLDED	FEOLDED	SPIN	SPUN	SPUNED
FORCE	FORCED	FORCEDT	SPLIT	SPLIT	SPLIT
FORGET	FORGOT	FORGEODT	SPREAD	SPREAD	SPREAD
FORM	FORMED	FORMED	SPY	SPIED	SPIED
FREEZE	FROZE	FROZE	TALK	TALKED	TALKED
FRY	FRIED	FRIED	TEACH	TAUGHT	TAUGHT
GAZE	GAZED	GAZED	TEAR	TORE	TORE
GEAR	GEARED	GEOAERTED	USE	USED	USED
GET	GOT	GOT	VEIL	VEILED	VEILED
GIVE	GAVE	GAOVED	VIEW	VIEWED	VIEWED
GLARE	GLARED	GEOAORED	VOICE	VOICED	VOICED
GLIDE	GLIDED	GLIDTED	WAKE	WOKE	WOKE
GLOW	GLOWED	GLEOWED	WEAVE	WOVE	WEOAVET
GO	WENT	WENT	WEEP	WEPT	WEPT
GOLF	GOLFED	GEOFED	WINK	WINKED	WIONKED
GRAZE	GRAZED	GRAZED	WRITE	WROTE	WRIOTED
GROW	GREW	GREOWE	YAWN	YAWNED	YAWNED
HAND	HANDED	HANDDDED	YELL	YELLED	YALLED
HANG	HUNG	HAUNG			
HARP	HARPED	HARPED			
HAVE	HAD	HADED			
HEAL	HEALED	HEOALED			
HEAR	HEARD	HEOARERDED			
HELP	HELPED	HELPED			
HINT	HINTED	HAINTED			
HOLD	HELD	HEOLDED			
HOPE	HOPED	HOPED			
HOWL	HOWLED	HEOWLED			
IS	WAS	WAS			
JERK	JERKED	JERKED			
JEST	JESTED	JESTED			
JOKE	JOKED	JOKED			
JUDGE	JUDGED	JUDGED			
KISS	KISSED	KISSED			
KNOW	KNEW	KNEW			
LAST	LASTED	LASTED			

Listing 2