$SPAD/src/input Makefile

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Abstract

Contents

1 Introduction

This creates the mnt/sys/input subdirectory. The files are known as "input" files which are a list of Axiom commands. Each file (say "foo.input") can run in an Axiom system with the command:

```
)read foo.input
```

Each of the files in this subdirectory is intended to achieve a three goals. First, the file shows examples of how to use Axiom algebra. Second, the file is used as a regression test to show that Axiom properly executes the algebra. Third, the file contains documentation on known bugs or missing algebra.

It is important to collect as many examples as we can of working algebra. In particular, we need machinery to extract algebra from other pamphlet files and automatically make them into input files. The more algebra we collect, use, and regression test the more robust the system will be.

When used to build a shipping system the default stanza "use" will build files that show working algebra examples.

When used for regression testing the stanza "regress" is used to build all of the working examples, run them, and compare them against known good output. Differences are highlighted and need to be documented or fixed.

When used for bug testing the stanza "bug" is used to build the algebra with known bug chunks included. These are run to check that known bugs have been fixed before shipping. Fixed code should be moved to the "regress" status, new working examples are built and the system should be built using "regress" to check that the build did not break anything.

1.1 genericRules

We use the special .PRECIOUS target to prevent deletion of the intermediate .input files which are needed during the processing of regress target.

— **genericRules** —

```
${OUT}/%.input: ${MID}/%.input
@ echo si01 making ${OUT}/$*.input from ${MID}/$*.input
@ cp ${MID}/$*.input ${OUT}/$*.input

.PRECIOUS: ${MID}/%.input

LISPTANGLE=${OBJ}/${SYS}/bin/lisp

${MID}/%.input: ${IN}/%.input.pamphlet
@ echo si02 making ${MID}/$*.input from ${IN}/$*.input.pamphlet
@(cd ${MID} ; \
          echo '(tangle "${IN}/$*.input.pamphlet" "*" "$*.input")' | \
          ${LISPTANGLE} )

${OUT}/%.as: ${MID}/%.as
```

```
@echo si03 making ${OUT}/$*.as from ${MID}/$*.as
@ cp ${MID}/$*.as ${OUT}/$*.as

${MID}/%.as: ${IN}/%.as.pamphlet
@echo si04 making ${MID}/$*.as from ${IN}/$*.as.pamphlet
@(cd ${MID} ; \
  ${BOOKS}/tanglec ${IN}/$*.as.pamphlet >$*.as)

${DOC}/axiom.sty:
@echo si05 making ${DOC}/axiom.sty from ${BOOKS}/axiom.sty
@cp ${BOOKS}/axiom.sty ${DOC}

${DOC}/%.input.dvi: ${IN}/%.input.pamphlet ${DOC}/axiom.sty
@ echo si06 making ${DOC}/$*.input.dvi from \
               ${IN}/$*.input.pamphlet
@ if [ "${BUILD}" = "full" ] ; then \
( cd ${DOC} ; \
cp ${IN}/$*.input.pamphlet ${DOC} ; \
latex $*.input.pamphlet ; \
dvipdf $*.input.dvi ; \
rm -f ${DOC}/$*.input.pamphlet ; \
rm -f ${DOC}/$*.input.dvi ; \
rm -f ${DOC}/$*.input.aux ; \
rm -f ${DOC}/$*.input.log ; \
rm -f ${DOC}/$*.input.toc ) ; fi

${DOC}/%.as.dvi: ${IN}/%.as.pamphlet
@ echo si07 making ${DOC}/$*.as.dvi from ${IN}/$*.as.pamphlet
@ (cd ${DOC} ; \
cp ${IN}/$*.as.pamphlet ${DOC} ; \
${EXTRACT} $*.as.pamphlet ; \
rm -f ${DOC}/$*.as.pamphlet ; \
rm -f ${DOC}/$*.as.tex ; \
rm -f ${DOC}/$*.as.dvi ; \
rm -f ${DOC}/$*.as )
```

———-

2 Testing stanzas (to be added)

— testing —

```
.SUFFIXES: .input .out

TESTSYS=  ${OBJ}/${SYS}/bin/interpsys
```

```
IN= ${SRC}/input

MID= ${INT}/input

OUT= ${OBJ}/${SYS}/input

INPUT=  ${MNT}/${SYS}/src/input

DOC=    ${MNT}/${SYS}/doc/src/input

all: announce
@ echo si08 making ${MID}
@ cp -p ${IN}/*.input ${MID}
@ cp -p ${IN}/axiom.test ${MID}/axiom.input
@ cp ${IN}/Makefile.int ${MID}/Makefile
@ (cd ${MID} ; \
   for i in *.input ;do \
    if test ! -f `basename $$i .input`.rec  ;then \
     echo aging ${MID}/`basename $$i .input`.rec ; \
     ${TOUCH} 0101010189 `basename $$i .input`.rec ;fi ;done)
@ (cd ${MID} ; ${MAKE} -f Makefile `echo *.rec` )
@ cp ${IN}/Makefile.obj ${OUT}/Makefile
@ cp -p ${MID}/*.rec ${OUT}
@ cp -p ${IN}/axiom.test ${MID}/axiom.input
@ (cd ${OUT} ; \
   for i in *.rec ;do \
    if test ! -f `basename $$i .rec`.out  ;then \
     echo aging ${OUT}/`basename $$i .rec`.out ; \
     ${TOUCH} 0101010189 `basename $$i .rec`.out ;fi ;done)
@ (cd ${OUT} ; ${MAKE} -f Makefile `echo *.out` )
# @ (cd ${OUT} ; maildiff )
@ echo done

announce:
@ echo ====================================
@ echo src/input BUILDING INPUT FILES
@ echo ====================================

.SUFFIXES: .input .rec

all:    ${OUTS}
@ echo si09 done with ${OUTS}

.input.rec:
@ echo si10 creating `pwd`/$*.rec
@ axiom -rm $*.input

and still further stanzas

.SUFFIXES: .rec .out
```

```
all: ${OUTS}
@ echo si11 obj done with ${OUTS}

.rec.out:
@ echo si12 running rec file $* from directory `pwd`
@ axiom -rv $*.rec
```

———-

3 The regression testing Makefile

This Makefile will be notangled into the int/input subdirectory. It will run regression tests over all of the input files. This will catch things we break but won't catch wrong results that were wrong in the past. Every input file that gets regression tested is assumed to have been hand-verified before it was added to the list.

— **regression tests** —

```
.SUFFIXES: .input .output

DAASE=${MNT}/${SYS}
TESTSYS=${OBJ}/${SYS}/bin/interpsys

SKIP= as-eg1.output as-eg2.output    \
      as-eg3.output    as-eg4.output    as-eg5.output    as-eg6.output    \
      bern.output      bernpoly.output  \
      c02aff.output    \
      c02agf.output    c05adf.output    c05nbf.output    c05pbf.output    \
      c06eaf.output    c06ebf.output    c06ecf.output    c06ekf.output    \
      c06fpf.output    c06fqf.output    c06frf.output    c06fuf.output    \
      c06gbf.output    c06gcf.output    c06gqf.output    c06gsf.output    \
      cdraw.output     color.output     cone.output      \
      coordsys.output  \
      cycloid2.output  cycloid3.output  cycloid.output   \
      d01ajf.output    d01akf.output    d01alf.output    d01amf.output    \
      d01anf.output    d01apf.output    d01aqf.output    d01asf.output    \
      d01bbf.output    d01fcf.output    d01gaf.output    d01gbf.output    \
      d02bbf.output    d02bhf.output    d02cjf.output    d02ejf.output    \
      d02gaf.output    d02gbf.output    d02kef.output    d02raf.output    \
      d03edf.output    d03eef.output    d03faf.output    damped.output    \
      de2re.output     defs.output      \
      draw2dsf.output  drawalg.output   drawcfn.output   drawcfun.output  \
      drawcurv.output  drawcx.output    drawex.output    draw.output      \
      drawpoly.output  drawx.output     dropt.output     e01baf.output    \
      e01bef.output    e01bff.output    e01bgf.output    e01bhf.output    \
      e01daf.output    e01saf.output    e01sbf.output    e01sef.output    \
```

```
      e01sff.output    e02adf.output    e02aef.output    e02agf.output    \
      e02ahf.output    e02ajf.output    e02akf.output    e02baf.output    \
      e02bbf.output    e02bcf.output    e02bdf.output    e02bef.output    \
      e02daf.output    e02dcf.output    e02ddf.output    e02def.output    \
      e02dff.output    e02gaf.output    e02zaf.output    e04dgf.output    \
      e04fdf.output    e04gcf.output    e04jaf.output    e04mbf.output    \
      e04naf.output    e04ucf.output    e04ycf.output    egg.output       \
      explot2d.output  explot3d.output  \
      f01brf.output    f01bsf.output    f01maf.output    \
      f01mcf.output    f01qcf.output    f01qdf.output    f01qef.output    \
      f01rcf.output    f01rdf.output    f01ref.output    f02aaf.output    \
      f02abf.output    f02adf.output    f02aef.output    f02aff.output    \
      f02agf.output    f02ajf.output    f02akf.output    f02awf.output    \
      f02axf.output    f02bbf.output    f02bjf.output    f02fjf.output    \
      f02wef.output    f02xef.output    f04adf.output    f04arf.output    \
      f04asf.output    f04atf.output    f04axf.output    f04faf.output    \
      f04jgf.output    f04maf.output    f04mbf.output    f04mcf.output    \
      f04qaf.output    f07adf.output    f07aef.output    f07fdf.output    \
      f07fef.output    folium.output    gary1.output     gnarly1.output   \
      graphics.output  grdef.output     helix.output     \
      images1a.output  images1.output   images2a.output  images2.output   \
      images3a.output  images3.output   images5a.output  images5.output   \
      images6a.output  images6.output   images7a.output  images7.output   \
      images8a.output  images8.output   inputform.output \
      knot.output      knownbugs.output \
      liss1.output     liss2.output     lump.output      matrox.output    \
      mountain.output  mult2d.output    mult3d.output    multknot.output  \
      ntube.output     palette.output   parpcurv.output  parscurv.output  \
      parsurf.output   pinch.output     plotfile.output  \
      plotlist.output  pollevel.output  ribbon.output    \
      ribbons.output   ribbonsnew.output rk4draw.output  \
      s01eaf.output    s13aaf.output    s13acf.output    s13adf.output    \
      s14aaf.output    s14abf.output    s14baf.output    s15adf.output    \
      s15aef.output    s17acf.output    s17adf.output    s17aef.output    \
      s17aff.output    s17agf.output    s17ahf.output    s17ajf.output    \
      s17akf.output    s17dcf.output    s17def.output    s17dgf.output    \
      s17dhf.output    s17dlf.output    s18acf.output    s18adf.output    \
      s18aef.output    s18aff.output    s18dcf.output    s18def.output    \
      s19aaf.output    s19abf.output    s19acf.output    s19adf.output    \
      s20acf.output    s20adf.output    s21baf.output    s21bbf.output    \
      s21bcf.output    s21bdf.output    saddle.output    \
      sininv.output    sinsin2.output   sinsin.output    spiral.output    \
      tetra.output     tknot.output     tschirn.output   typo.output      \
      vectors.output   wester.output    wiggle.output    zimmbron.output

# Error ASEC is invalid as a function.
ASEC=errortrap.output

# Error: The function WRAPPED is undefined.
WRAPPED=loop.output
```

```
# Error: Value stack overflow.
VALUESTACK=tutchap67.output

# Broken at |STAGG-;ELT;AIS;5|.  Type :H for Help.
STAGG=reductio.output

# Broken at |GSERIES;INTEGRATE;2$;6|.  Type :H for Help.
GSERIES=fixed.output

# never finishes
INFINITELOOP=lextripk.output

OUTS= ffrac.output     \
      huang.output     \
      intlf.output     \
      lib.output       \
      marcbench.output \
      synonym2.output  \
      synonym.output   \
      tsetcatbutcher.output tsetcatchemical.output \
      tree.output      \
      tutchap2.output  tutchap3.output  tutchap4.output  \
      up.output        \
      vector.output    viewdef.output   \
      wutset.output    \
      xpoly.output     xpr.output       \
      zdsolve.output   zlindep.output

REGRESSTESTS= ackermann.regress \
    algaggr.regress algbrbf.regress  algfacob.regress alist.regress  \
    allfact.regress   antoine.regress \
    arith.regress     array1.regress   array2.regress \
    arrows.regress    asinatan.regress asinhatanh.regress \
    assign.regress    atansqrt.regress \
    asec.regress      bbtree.regress   besselk.regress \
    binary.regress    bini.regress     biquat.regress \
    bop.regress       bstree.regress   bouquet.regress \
    branchcut.regress \
    bug100.regress    bug101.regress \
    bug103.regress    bug10069.regress \
    bugs.regress      bug10312.regress bug6357.regress  bug9057.regress \
    cachedf.regress   calcprob.regress  \
    calculus2.regress calculus.regress cardinal.regress card.regress \
    carten.regress    cclass.regress   char.regress     ch.regress \
    charlwood.regress cherry.regress    \
    chtheorem.regress classtalk.regress clements.regress \
    clifford.regress  clif.regress     cmds.regress \
    coercels.regress  collect.regress  cohen.regress \
    complex.regress   complexfactor.regress conformal.regress \
```

```
constant.regress  contfrac.regress contfrc.regress \
curl.regress      curry.regress    cwmmt.regress \
cycles1.regress   cycles.regress   cyfactor.regress \
danzwill.regress  danzwill2.regress  davenport.regress \
davis.regress \
decimal.regress   defintef.regress defintrf.regress \
derham.regress    derivefail.regress \
dfloat.regress    dftrig.regress \
dhmatrix.regress  \
dhtri.regress     directproduct.regress distexpr.regress \
divisor.regress   donsimple.regress \
dmp.regress       dop.regress      dpol.regress     \
e1.regress        ei.regress \
easter.regress    efi.regress \
eigen.regress     elemfun.regress  elemnum.regress  elfuts.regress \
elt.regress       en.regress \
eq.regress        eqtbl.regress    equation2.regress \
equation.regress  erf.regress \
evalex.regress   eval.regress     exdiff.regress \
exampleagcode.regress \
exint.regress     exit.regress     exlap.regress    exlimit.regress \
exp.regress       exptest.regress \
expexpan.regress  explim.regress   expr1.regress    exprode.regress \
expr.regress      exseries.regress exsum.regress    exprpoly.regress \
farray.regress    ffdemo.regress   fferr.regress    ffieldbug.regress \
ffx72.regress \
fib.regress       finitegraph.regress \
file.regress      fixed.regress \
float1.regress    float2.regress \
float.regress     fname1.regress   fname.regress    fnla.regress \
fns.regress       fparfrac.regress fparfrc.regress  \
frame.regress     fr1.regress \
fr2.regress       frac.regress     fr.regress       free.regress \
function.regress  functioncode.regress \
galois.regress    gamma.regress \
gbf.regress       genups.regress   gonshor.regress  grpthry.regress \
gstbl.regress     guess.regress \
heap.regress      heat.regress     help.regress \
herm.regress      heugcd.regress \
hexadec.regress   hyperbolicrules.regress  \
hyperell.regress  ico.regress       ideal.regress \
ifact.regress     ifthenelse.regress i2e.regress \
infprod.regress   intaf.regress    intbypart.regress \
inputform.regress intdeq.regress \
intef2.regress    intef.regress    intg0.regress    intheory.regress \
intmix2.regress   intmix.regress   int.regress      intrf.regress \
iprntpk.regress \
ipftest.regress   is.regress       isprime.regress   \
kernel.regress    knot2.regress    kovacic.regress  kuipers.regress \
laplace.regress   leg.regress      limit.regress    linalg.regress \
```

```
lindep.regress    liska.regress    list.regress     liu.regress   \
lode.regress      lodesys.regress  lodo1.regress \
lodo2.regress     lodo3.regress    lodof.regress    lodo.regress \
log.regress \
lpoly.regress     lupfact.regress  lword.regress    macbug.regress \
machinearithmetic.regress \
macros.regress    magma.regress    manuel.regress   mapleok.regress   \
matbug.regress    mathml.regress   \
matrix1.regress   matrix22.regress matrix.regress \
mfinfact.regress  mkfunc.regress   monitortest.regress \
mpoly.regress     mset2.regress \
mset.regress      multfact.regress multiple.regress ndftip.regress \
negfloats.regress nepip.regress    newlodo.regress  newton.regress \
newtonlisp.regress numericgamma.regress \
nlode.regress     nonlinhomodiffeq.regress \
none.regress      noonburg.regress noptip.regress \
nqip.regress      nsfip.regress    numbers.regress  octonion.regress \
oct.regress       ode.regress      odpol.regress    op1.regress \
opalg.regress     operator.regress op.regress       ovar.regress \
overload.regress  padic.regress    paff.regress     paffexample.regress \
parabola.regress  pascal1.regress  pascal.regress \
patch51.regress    \
patmatch.regress  pat.regress      perman.regress   perm.regress \
pfaffian.regress  pfr1.regress     pfr.regress      pgcd.regress \
pmint.regress     polygamma.regress \
poly1.regress     polycoer.regress poly.regress     psgenfcn.regress \
quat1.regress     quat.regress     r20abugs.regress r20bugs.regress \
r21bugsbig.regress r21bugs.regress radff.regress    radix.regress \
realclos.regress  reclos.regress   reclos2.regress  regset.regress \
repa6.regress     risch.regress \
robidoux.regress \
roman.regress     romanpolynomials.regress \
roots.regress     rsa.regress \
ruleset.regress   rules.regress \
rubey.regress     sae.regress      segletes.regress \
spline.regress \
scherk.regress    scope.regress    seccsc.regress \
segbind.regress   seg.regress \
series2.regress   series.regress   sersolve.regress set.regress \
setcmd.regress    shannonmatrix.regress simplify.regress \
sincos.regress    sinhcosh.regress \
sincosex.regress  sint.regress     skew.regress     slowint.regress \
solveperf.regress \
solvetra.regress  space3.regress   sqmatrix.regress sqrt3.regress \
sregset.regress \
stbl.regress      stream2.regress  stream.regress   streams.regress \
string.regress    strtbl.regress   subset.regress   summation.regress \
symbol.regress    t111293.regress  table.regress    tancot.regress \
tanhcoth.regress  tanatan.regress  tbagg.regress    telford.regress \
test.regress      testpackage.regress \
```

```
    testprob.regress  textfile.regress torus.regress    tuplebug.regress \
    tpiezas001.regress \
    tpiezas002.regress tree.regress    trigtests.regress \
    triglim.regress   tsetcatvermeer.regress            tutchap1.regress \
    typetower.regress void.regress      uniseg.regress \
    unittest1.regress unittest2.regress unittest3.regress unittest4.regress \
    unit-macro.regress wangeez.regress \
    zimmbron.regress zimmer.regress
```

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— **regression tests** —

```
CATSTESTS= \
    kamke0.regress    kamke1.regress   kamke2.regress   kamke3.regress \
    kamke4.regress    kamke5.regress   kamke6.regress   kamke7.regress \
    schaum1.regress   schaum2.regress  schaum3.regress  schaum4.regress \
    schaum5.regress   schaum6.regress  schaum7.regress  schaum8.regress \
    schaum9.regress   schaum10.regress schaum11.regress schaum12.regress \
    schaum13.regress  schaum14.regress schaum15.regress schaum16.regress \
    schaum17.regress  schaum18.regress schaum19.regress schaum20.regress \
    schaum21.regress  schaum22.regress schaum23.regress schaum24.regress \
    schaum25.regress  schaum26.regress schaum27.regress schaum28.regress \
    schaum29.regress  schaum30.regress schaum31.regress schaum32.regress \
    schaum33.regress  schaum34.regress
```

———-

These long-running tests have been split into a different group so we can run them in parallel.

— **regression tests** —

```
NEWRICHTESTSa= rich1a.regress rich1b.regress rich2.regress  \
               rich3a.regress rich3b.regress rich3c.regress \
               rich3d.regress rich3e.regress rich3f.regress \
               rich3g.regress rich3h.regress rich3i.regress \
               rich3j.regress rich3k.regress rich3l.regress \
               rich3m.regress rich3n.regress rich3o.regress \
               rich3p.regress rich3q.regress rich3r.regress \
               rich3s.regress rich3t.regress rich4a.regress \
               rich4b.regress rich4c.regress rich4d.regress \
               rich4e.regress rich4f.regress rich4g.regress \
               rich4h.regress rich4i.regress rich4j.regress \
               rich5.regress  rich6a.regress rich6b.regress \
               rich6c.regress rich6d.regress rich6e.regress \
               rich7.regress  rich8a.regress rich8b.regress \
               rich8c.regress rich8d.regress rich9a.regress \
               rich9b.regress rich10a.regress rich10b.regress \
               rich10c.regress rich10d.regress rich10e.regress \
               rich10f.regress rich11a.regress rich11b.regress \
               rich11c.regress rich11d.regress rich11e.regress \
```

```
                richder1a.regress richder1b.regress richder2.regress \
                richder3a.regress richder3b.regress richder3c.regress \
                richder3d.regress richder3e.regress richder3f.regress \
                richder3g.regress richder3h.regress richder3i.regress \
                richder3j.regress richder3k.regress richder3l.regress \
                richder3m.regress richder3n.regress richder3o.regress \
                richder3p.regress richder3q.regress richder3r.regress \
                richder3s.regress richder3t.regress richder4a.regress \
                richder4b.regress richder4c.regress richder4d.regress \
                richder4e.regress richder4f.regress richder5.regress \
                richder6a.regress richder6b.regress richder6c.regress \
                richder6d.regress richder6e.regress


NEWRICHTESTS = rich12a.regress rich12b.regress rich12c.regress \
                rich12d.regress rich12e.regress rich12f.regress \
                richder12a.regress richder12b.regress richder12c.regress \
                richder12d.regress richder12e.regress richder12f.regress

RICHTESTS= \
    richalgebraic000-099.regress \
    richalgebraic100-199.regress \
    richalgebraic200-299.regress \
    richalgebraic300-399.regress \
    richalgebraic400-461.regress \
    richerror000-078.regress \
    richexponential.regress \
    richhyper000-099.regress \
    richhyper100-199.regress \
    richhyper200-299.regress \
    richhyper300-399.regress \
    richhyper400-499.regress \
    richhyper500-599.regress \
    richhyper600-699.regress \
    richhyper700-799.regress \
    richhyper800-899.regress \
    richhyper900-999.regress \
    richhyper1000-1098.regress \
    richinvhyper000-099.regress \
    richinvhyper100-199.regress \
    richintfunc000-032.regress \
    richinvtrig000-092.regress \
    richlog000-099.regress \
    richlog100-199.regress \
    richlog200-299.regress \
    richlog300-391.regress \
    richrational.regress \
    richspecfunc000-022.regress \
    richtrig000-099.regress \
    richtrig100-199.regress \
```

```
    richtrig200-299.regress \
    richtrig300-399.regress \
    richtrig400-499.regress \
    richtrig500-599.regress \
    richtrig600-699.regress \
    richtrig700-799.regress \
    richtrig800-899.regress \
    richtrig900-920.regress

IN=     ${SRC}/input
MID= ${INT}/input
TMPFN:=$(shell echo $$RANDOM)

LISPTANGLE=${OBJ}/${SYS}/bin/lisp

all: alltests

algebratests: ${OUTS}
@ echo si13 starting algebra regression testing
@ (cd ${MID} ; \
  ${BOOKS}/tanglec ${SRC}/algebra/Makefile.pamphlet algebra.regress \
            >Makefile.algebra ; \
          ${MAKE} -f Makefile.algebra )
@ echo si14 finished ${INT}/input

newrichtests: ${NEWRICHTESTS} ${OUTS}
@ echo ====================================
@ echo src/input RUNNING NEW RICH TESTS
@ echo ====================================

richtests: ${RICHTESTS} ${OUTS}
@ echo ====================================
@ echo src/input RUNNING RICH TESTS
@ echo ====================================

catstests: ${CATSTESTS} ${OUTS}
@ echo ====================================
@ echo src/input RUNNING CATS TESTS
@ echo ====================================

regresstests: ${REGRESSTESTS} ${OUTS}
@ echo ====================================
@ echo src/input RUNNING REGRESSION TESTS
@ echo ====================================

alltests: regresstests catstests newrichtests richtests algebratests ${OUTS}
@ echo ====================================
@ echo src/input RUNNING ALL TESTS
@ echo ====================================
```

```
notests:
@ echo ====================================
@ echo src/input RUNNING NO TESTS
@ echo ====================================

%.input: ${IN}/%.input.pamphlet
@ echo si15 making ${MID}/$*.input from ${IN}/$*.input.pamphlet
@(cd ${MID} ; \
         echo '(tangle "${IN}/$*.input.pamphlet" "*" "$*.input")' | \
  ${LISPTANGLE} 1>/dev/null 2>/dev/null)
```

———-

The curious use of `egrep` in the pipeline is to remove the spurious differences caused by the Version and Timestamp lines in the standard Axiom banner. These cause mismatches in otherwise identical output.

The input files are not removed because this parallel builds create race conditions.

— **regression tests** —

```
%.output: %.input
@ echo si16 running test file $* using $*tpd.input
@ echo ')set message test on' > $*tpd.input
@ echo ')set message auto off' >> $*tpd.input
@ echo ')read $*' >> $*tpd.input
@ echo ')lisp (bye)' >> $*tpd.input
@ if [ -z "${NOISE}" ] ; then \
   echo ")read $*tpd.input" | ${TESTSYS} \
                | egrep -v '(Timestamp|Version)' | tee $*.output ; \
  else \
   echo ")read $*tpd.input" | ${TESTSYS} \
                | egrep -v '(Timestamp|Version)' > $*.output ; \
  fi
# @ rm $*.input
```

———-

A regression test file will run the input file. Each input file specifies that it creates an output file using the)spool command. A regression file contains the expected output in specially formatted comments. These output files are run thru the regress function which compares the actual results against the expected results.

We need to copy the original pamphlet file to the MID directory because in at least one case (cwmmt.regress) we have spad test code in the input file that needs to be extracted and compiled. This is done by commands within the input file itself and uses the built-in gclweb function (see src/interp/gclweb.lisp)

— **regression tests** —

```
%.regress: %.input
@ echo si17 regression testing $*
@ (cd ${MID} ; \
  rm -f $*.output ; \
```

```
  if [ -z "${NOISE}" ] ; then \
           echo ')read $*.input' | ${TESTSYS} ; \
  else \
           echo ')read $*.input' | ${TESTSYS} >${TMP}/trace ; \
  fi ; \
  if [ -z "${NOISE}" ] ; then \
           echo ')lisp (regress "$*.output")' | ${TESTSYS} \
                | egrep -v '(Timestamp|Version)' | tee $*.regress ; \
  else \
           echo ')lisp (regress "$*.output")' | ${TESTSYS} \
                | egrep -v '(Timestamp|Version)' > $*.regress ; \
  fi ; \
  fgrep "regression result" $*.regress )
```

———-

4 The Makefile

This Makefile will be notangled into the src/input subdirectory.

— * —

```
IN=${SRC}/input
MID=${INT}/input
OUT=${MNT}/${SYS}/input
DOC=${MNT}/${SYS}/doc/src/input


ASFILES=${OUT}/aseg6.as   ${OUT}/aseg7.as  ${OUT}/ecfact.as \
        ${OUT}/hilbert.as ${OUT}/matops.as ${OUT}/pdecomp0.as \
        ${OUT}/romnum.as

NAGLIB=${OUT}/c02aff.input   ${OUT}/c02agf.input     ${OUT}/c05adf.input \
       ${OUT}/c05nbf.input   ${OUT}/c05pbf.input     ${OUT}/c06eaf.input \
       ${OUT}/c06ebf.input   ${OUT}/c06ecf.input     ${OUT}/c06ekf.input \
       ${OUT}/c06fpf.input   ${OUT}/c06fqf.input     ${OUT}/c06frf.input \
       ${OUT}/c06fuf.input   ${OUT}/c06gbf.input     ${OUT}/c06gcf.input \
       ${OUT}/c06gqf.input   ${OUT}/c06gsf.input     \
       ${OUT}/d01ajf.input   ${OUT}/d01akf.input     ${OUT}/d01alf.input \
       ${OUT}/d01amf.input   ${OUT}/d01anf.input     ${OUT}/d01apf.input \
       ${OUT}/d01aqf.input   ${OUT}/d01asf.input     ${OUT}/d01bbf.input \
       ${OUT}/d01fcf.input   ${OUT}/d01gaf.input     ${OUT}/d01gbf.input \
       ${OUT}/d02bbf.input   ${OUT}/d02bhf.input     ${OUT}/d02cjf.input \
       ${OUT}/d02ejf.input   ${OUT}/d02gaf.input     ${OUT}/d02gbf.input \
       ${OUT}/d02kef.input   ${OUT}/d02raf.input     ${OUT}/d03edf.input \
       ${OUT}/d03eef.input   ${OUT}/d03faf.input     \
       ${OUT}/e01baf.input   ${OUT}/e01bef.input     ${OUT}/e01bff.input \
       ${OUT}/e01bgf.input   ${OUT}/e01bhf.input     ${OUT}/e01daf.input \
```

```
        ${OUT}/e01saf.input   ${OUT}/e01sbf.input     ${OUT}/e01sef.input \
        ${OUT}/e01sff.input   ${OUT}/e02adf.input     ${OUT}/e02aef.input \
        ${OUT}/e02agf.input   ${OUT}/e02ahf.input     ${OUT}/e02ajf.input \
        ${OUT}/e02akf.input   ${OUT}/e02baf.input     ${OUT}/e02bbf.input \
        ${OUT}/e02bcf.input   ${OUT}/e02bdf.input     ${OUT}/e02bef.input \
        ${OUT}/e02daf.input   ${OUT}/e02dcf.input     ${OUT}/e02ddf.input \
        ${OUT}/e02def.input   ${OUT}/e02dff.input     ${OUT}/e02gaf.input \
        ${OUT}/e02zaf.input   ${OUT}/e04dgf.input     ${OUT}/e04fdf.input \
        ${OUT}/e04gcf.input   ${OUT}/e04jaf.input     ${OUT}/e04mbf.input \
        ${OUT}/e04naf.input   ${OUT}/e04ucf.input     ${OUT}/e04ycf.input \
        ${OUT}/f01brf.input   ${OUT}/f01bsf.input     ${OUT}/f01maf.input \
        ${OUT}/f01mcf.input   ${OUT}/f01qcf.input     ${OUT}/f01qdf.input \
        ${OUT}/f01qef.input   ${OUT}/f01rcf.input     ${OUT}/f01rdf.input \
        ${OUT}/f01ref.input   ${OUT}/f02aaf.input     ${OUT}/f02abf.input \
        ${OUT}/f02adf.input   ${OUT}/f02aef.input     ${OUT}/f02aff.input \
        ${OUT}/f02agf.input   ${OUT}/f02ajf.input     ${OUT}/f02akf.input \
        ${OUT}/f02awf.input   ${OUT}/f02axf.input     ${OUT}/f02bbf.input \
        ${OUT}/f02bjf.input   ${OUT}/f02fjf.input     ${OUT}/f02wef.input \
        ${OUT}/f02xef.input   ${OUT}/f04adf.input     ${OUT}/f04arf.input \
        ${OUT}/f04asf.input   ${OUT}/f04atf.input     ${OUT}/f04axf.input \
        ${OUT}/f04faf.input   ${OUT}/f04jgf.input     ${OUT}/f04maf.input \
        ${OUT}/f04mbf.input   ${OUT}/f04mcf.input     ${OUT}/f04qaf.input \
        ${OUT}/f07adf.input   ${OUT}/f07aef.input     ${OUT}/f07fdf.input \
        ${OUT}/f07fef.input   \
        ${OUT}/s01eaf.input   ${OUT}/s13aaf.input     ${OUT}/s13acf.input \
        ${OUT}/s13adf.input   ${OUT}/s14aaf.input     ${OUT}/s14abf.input \
        ${OUT}/s14baf.input   ${OUT}/s15adf.input     ${OUT}/s15aef.input \
        ${OUT}/s17acf.input   ${OUT}/s17adf.input     ${OUT}/s17aef.input \
        ${OUT}/s17aff.input   ${OUT}/s17agf.input     ${OUT}/s17ahf.input \
        ${OUT}/s17ajf.input   ${OUT}/s17akf.input     ${OUT}/s17dcf.input \
        ${OUT}/s17def.input   ${OUT}/s17dgf.input     ${OUT}/s17dhf.input \
        ${OUT}/s17dlf.input   ${OUT}/s18acf.input     ${OUT}/s18adf.input \
        ${OUT}/s18aef.input   ${OUT}/s18aff.input     ${OUT}/s18dcf.input \
        ${OUT}/s18def.input   ${OUT}/s19aaf.input     ${OUT}/s19abf.input \
        ${OUT}/s19acf.input   ${OUT}/s19adf.input     ${OUT}/s20acf.input \
        ${OUT}/s20adf.input   ${OUT}/s21baf.input     ${OUT}/s21bbf.input \
        ${OUT}/s21bcf.input   ${OUT}/s21bdf.input

FILES= ${OUT}/ackermann.input \
        ${OUT}/algaggr.input  ${OUT}/algbrbf.input    ${OUT}/algfacob.input \
        ${OUT}/alist.input    ${OUT}/allfact.input    ${OUT}/antoine.input  \
        ${OUT}/array1.input   ${OUT}/array2.input     ${OUT}/arrows.input \
        ${OUT}/asinatan.input ${OUT}/asinhatanh.input \
        ${OUT}/assign.input   ${OUT}/atansqrt.input   ${OUT}/axiom.input \
        ${OUT}/asec.input \
        ${OUT}/bbtree.input   ${OUT}/besselk.input \
        ${OUT}/bern.input \
        ${OUT}/bernpoly.input ${OUT}/binary.input     ${OUT}/bini.input \
        ${OUT}/biquat.input   ${OUT}/bop.input \
        ${OUT}/bouquet.input  ${OUT}/branchcut.input \
```

```
${OUT}/bstree.input   ${OUT}/bug6357.input \
${OUT}/bug9057.input  ${OUT}/bug100.input     ${OUT}/bug101.input \
${OUT}/bug103.input \
${OUT}/bug10069.input ${OUT}/bug10312.input   ${OUT}/cachedf.input \
${OUT}/calcprob.input ${OUT}/calculus.input \
${OUT}/cardinal.input ${OUT}/card.input       ${OUT}/carten.input \
${OUT}/cclass.input   ${OUT}/cdraw.input      ${OUT}/char.input \
${OUT}/ch.input       ${OUT}/charlwood.input  ${OUT}/cherry.input \
${OUT}/chtheorem.input  ${OUT}/classtalk.input \
${OUT}/clifford.input ${OUT}/clements.input \
${OUT}/clif.input       ${OUT}/cmds.input \
${OUT}/coercels.input ${OUT}/collect.input    ${OUT}/color.input \
${OUT}/complex.input  ${OUT}/complexfactor.input ${OUT}/cohen.input \
${OUT}/cone.input       ${OUT}/conformal.input \
${OUT}/constant.input \
${OUT}/contfrac.input ${OUT}/contfrc.input    ${OUT}/coordsys.input \
${OUT}/curl.input     ${OUT}/curry.input \
${OUT}/cycles.input   ${OUT}/cycles1.input    ${OUT}/cycloid.input  \
${OUT}/cycloid2.input \
${OUT}/cycloid3.input ${OUT}/cyfactor.input   ${OUT}/damped.input \
${OUT}/danzwill.input ${OUT}/danzwill2.input  ${OUT}/davenport.input \
${OUT}/davis.input    ${OUT}/decimal.input    ${OUT}/defs.input \
${OUT}/defintef.input ${OUT}/defintrf.input   ${OUT}/derham.input \
${OUT}/derivefail.input ${OUT}/de2re.input \
${OUT}/dfloat.input   ${OUT}/dftrig.input     ${OUT}/dhmatrix.input \
${OUT}/dhtri.input    ${OUT}/directproduct.input \
${OUT}/distexpr.input ${OUT}/divisor.input ${OUT}/donsimple.input \
${OUT}/dmp.input      ${OUT}/dop.input \
${OUT}/dpol.input     ${OUT}/draw2dsf.input \
${OUT}/drawalg.input  ${OUT}/drawcfn.input \
${OUT}/drawcfun.input ${OUT}/drawcurv.input \
${OUT}/draw.input     ${OUT}/drawcx.input     ${OUT}/drawex.input \
${OUT}/drawpoly.input ${OUT}/drawx.input      ${OUT}/e1.input     \
${OUT}/ei.input       \
${OUT}/easter.input   ${OUT}/efi.input        ${OUT}/egg.input      \
${OUT}/eigen.input \
${OUT}/elemfun.input  ${OUT}/elemnum.input    ${OUT}/elfuts.input \
${OUT}/elt.input      ${OUT}/en.input \
${OUT}/eq.input       ${OUT}/eqtbl.input      ${OUT}/equation.input \
${OUT}/errortrap.input \
${OUT}/eval.input     ${OUT}/exit.input       ${OUT}/exptest.input \
${OUT}/exp.input      ${OUT}/expexpan.input \
${OUT}/explim.input   ${OUT}/explot2d.input   ${OUT}/explot3d.input \
${OUT}/expr1.input    ${OUT}/exprpoly.input \
${OUT}/farray.input   ${OUT}/ffdemo.input \
${OUT}/fferr.input    ${OUT}/ffrac.input      ${OUT}/ffieldbug.input \
${OUT}/ffx72.input \
${OUT}/fib.input      ${OUT}/finitegraph.input \
${OUT}/fixed.input \
${OUT}/file.input     ${OUT}/float2.input \
```

```
${OUT}/float.input    ${OUT}/float1.input     ${OUT}/fname.input \
${OUT}/fname1.input   ${OUT}/fnla.input       ${OUT}/folium.input   \
${OUT}/fparfrac.input \
${OUT}/fparfrc.input  ${OUT}/fr2.input        ${OUT}/frac.input \
${OUT}/fr.input       ${OUT}/frame.input \
${OUT}/fr1.input      ${OUT}/gary1.input \
${OUT}/gbf.input      ${OUT}/genups.input     ${OUT}/gnarly1.input \
${OUT}/gonshor.input  ${OUT}/grdef.input    \
${OUT}/gstbl.input    ${OUT}/guess.input \
${OUT}/heap.input     ${OUT}/heat.input       ${OUT}/helix.input \
${OUT}/herm.input     ${OUT}/heugcd.input \
${OUT}/hexadec.input  ${OUT}/huang.input \
${OUT}/hyperbolicrules.input \
${OUT}/hyperell.input \
${OUT}/ico.input      ${OUT}/ideal.input      ${OUT}/ifact.input \
${OUT}/ifthenelse.input ${OUT}/i2e.input \
${OUT}/images1.input  ${OUT}/images1a.input   ${OUT}/images3a.input \
${OUT}/images3.input  ${OUT}/images6.input    ${OUT}/images6a.input \
${OUT}/images7.input  ${OUT}/images7a.input   ${OUT}/infprod.input \
${OUT}/inputform.input  ${OUT}/intaf.input    ${OUT}/intbypart.input \
${OUT}/intdeq.input   ${OUT}/intef.input \
${OUT}/intg0.input    ${OUT}/intheory.input   ${OUT}/int.input \
${OUT}/intlf.input    ${OUT}/intmix.input     ${OUT}/intrf.input \
${OUT}/ipftest.input  ${OUT}/is.input         ${OUT}/isprime.input \
${OUT}/kamke0.input     ${OUT}/kamke1.input \
${OUT}/kamke2.input   ${OUT}/kamke3.input     ${OUT}/kamke4.input \
${OUT}/kamke5.input   ${OUT}/kamke6.input     ${OUT}/kamke7.input \
${OUT}/kernel.input   ${OUT}/knot.input \
${OUT}/kovacic.input  ${OUT}/kuipers.input  \
${OUT}/laplace.input  ${OUT}/leg.input      \
${OUT}/lextripk.input ${OUT}/lib.input        ${OUT}/limit.input \
${OUT}/linalg.input \
${OUT}/lindep.input   ${OUT}/liska.input \
${OUT}/liss1.input    ${OUT}/liss2.input \
${OUT}/list.input     ${OUT}/liu.input \
${OUT}/lode.input     ${OUT}/lodesys.input \
${OUT}/lodo1.input    ${OUT}/lodo2.input      ${OUT}/lodof.input \
${OUT}/lodo.input     ${OUT}/lodo3.input      ${OUT}/log.input \
${OUT}/lpoly.input    ${OUT}/lump.input \
${OUT}/lupfact.input  ${OUT}/lword.input      ${OUT}/macbug.input \
${OUT}/machinearithmetic.input \
${OUT}/macros.input   ${OUT}/marcbench.input  ${OUT}/magma.input \
${OUT}/manuel.input   ${OUT}/mapleok.input  ${OUT}/matbug.input \
${OUT}/mathml.input \
${OUT}/matrix22.input ${OUT}/matrix.input     ${OUT}/matrix1.input \
${OUT}/mfinfact.input ${OUT}/mkfunc.input     ${OUT}/monitortest.input \
${OUT}/mountain.input \
${OUT}/mpoly.input    ${OUT}/mset.input       ${OUT}/mset2.input \
${OUT}/multfact.input ${OUT}/multknot.input   ${OUT}/mult3d.input \
${OUT}/multiple.input \
```

```
${OUT}/ndftip.input   ${OUT}/newlodo.input \
${OUT}/negfloats.input \
${OUT}/nepip.input    ${OUT}/newton.input  ${OUT}/newtonlisp.input \
${OUT}/numericgamma.input ${OUT}/nonlinhomodiffeq.input \
${OUT}/nlode.input    ${OUT}/none.input       ${OUT}/noonburg.input \
${OUT}/noptip.input   ${OUT}/nqip.input       ${OUT}/nsfip.input \
${OUT}/ntube.input    ${OUT}/oct.input        ${OUT}/ode.input \
${OUT}/octonion.input ${OUT}/odpol.input \
${OUT}/opalg.input    ${OUT}/operator.input   ${OUT}/op.input \
${OUT}/op1.input      ${OUT}/ovar.input       ${OUT}/overload.input \
${OUT}/padic.input    ${OUT}/paff.input       ${OUT}/paffexample.input \
${OUT}/palette.input \
${OUT}/parpcurv.input ${OUT}/parscurv.input   ${OUT}/parsurf.input \
${OUT}/pascal1.input \
${OUT}/pascal.input   \
${OUT}/patch51.input \
${OUT}/patmatch.input ${OUT}/perman.input \
${OUT}/perm.input     ${OUT}/pfaffian.input \
${OUT}/pfr.input      ${OUT}/pfr1.input       ${OUT}/pgcd.input \
${OUT}/pinch.input    ${OUT}/plotfile.input   ${OUT}/pollevel.input \
${OUT}/pmint.input    ${OUT}/polygamma.input ${OUT}/polycoer.input \
${OUT}/poly1.input    ${OUT}/psgenfcn.input   \
${OUT}/quat.input     ${OUT}/quat1.input      ${OUT}/ribbon.input   \
${OUT}/ribbons.input  ${OUT}/ribbonsnew.input \
${OUT}/rich1a.input   ${OUT}/rich1b.input     \
${OUT}/rich2.input    ${OUT}/rich3a.input     ${OUT}/rich3b.input \
${OUT}/rich3c.input   ${OUT}/rich3d.input     ${OUT}/rich3e.input \
${OUT}/rich3f.input   ${OUT}/rich3g.input     ${OUT}/rich3h.input \
${OUT}/rich3i.input   ${OUT}/rich3j.input     ${OUT}/rich3k.input \
${OUT}/rich3l.input   ${OUT}/rich3m.input     ${OUT}/rich3n.input \
${OUT}/rich3o.input   ${OUT}/rich3p.input     ${OUT}/rich3q.input \
${OUT}/rich3r.input   ${OUT}/rich3s.input     ${OUT}/rich3t.input \
${OUT}/rich4a.input   ${OUT}/rich4b.input     ${OUT}/rich4c.input \
${OUT}/rich4d.input   ${OUT}/rich4e.input     ${OUT}/rich4f.input \
${OUT}/rich4g.input   ${OUT}/rich4h.input     ${OUT}/rich4i.input \
${OUT}/rich4j.input   ${OUT}/rich5.input      ${OUT}/rich6a.input \
${OUT}/rich6b.input   ${OUT}/rich6c.input     ${OUT}/rich6d.input \
${OUT}/rich6e.input   \
${OUT}/rich7.input ${OUT}/rich8a.input ${OUT}/rich8b.input \
${OUT}/rich8c.input ${OUT}/rich8d.input ${OUT}/rich9a.input \
${OUT}/rich9b.input \
${OUT}/rich10a.input ${OUT}/rich10b.input \
${OUT}/rich10c.input ${OUT}/rich10d.input \
${OUT}/rich10e.input ${OUT}/rich10f.input \
${OUT}/rich11a.input ${OUT}/rich11b.input \
${OUT}/rich11c.input ${OUT}/rich11d.input \
${OUT}/rich11e.input  \
${OUT}/rich12a.input ${OUT}/rich12b.input \
${OUT}/rich12c.input ${OUT}/rich12d.input \
${OUT}/rich12e.input ${OUT}/rich12f.input \
```

```
${OUT}/richder1a.input ${OUT}/richder1b.input \
${OUT}/richder2.input  ${OUT}/richder3a.input \
${OUT}/richder3b.input ${OUT}/richder3c.input \
${OUT}/richder3d.input ${OUT}/richder3e.input \
${OUT}/richder3f.input ${OUT}/richder3g.input \
${OUT}/richder3h.input ${OUT}/richder3i.input \
${OUT}/richder3j.input ${OUT}/richder3k.input \
${OUT}/richder3l.input ${OUT}/richder3m.input \
${OUT}/richder3n.input ${OUT}/richder3o.input \
${OUT}/richder3p.input ${OUT}/richder3q.input \
${OUT}/richder3r.input ${OUT}/richder3s.input \
${OUT}/richder3t.input \
${OUT}/richder4a.input ${OUT}/richder4b.input \
${OUT}/richder4c.input ${OUT}/richder4d.input \
${OUT}/richder4e.input ${OUT}/richder4f.input \
${OUT}/richder5.input \
${OUT}/richder6a.input ${OUT}/richder6b.input \
${OUT}/richder6c.input ${OUT}/richder6d.input \
${OUT}/richder6e.input \
${OUT}/richder12a.input ${OUT}/richder12b.input \
${OUT}/richder12c.input ${OUT}/richder12d.input \
${OUT}/richder12e.input  ${OUT}/richder12f.input \
${OUT}/rk4draw.input  \
${OUT}/r20abugs.input \
${OUT}/r20bugs.input  ${OUT}/r21bugsbig.input \
${OUT}/r21bugs.input \
${OUT}/radff.input    ${OUT}/radix.input      ${OUT}/realclos.input \
${OUT}/reclos.input   ${OUT}/reclos2.input    ${OUT}/regset.input   \
${OUT}/risch.input \
${OUT}/robidoux.input ${OUT}/roman.input      ${OUT}/roots.input \
${OUT}/rsa.input \
${OUT}/ruleset.input  ${OUT}/rules.input      ${OUT}/rubey.input \
${OUT}/sae.input \
${OUT}/spline.input   ${OUT}/segletes.input   ${OUT}/schaum1.input \
${OUT}/schaum2.input  ${OUT}/schaum3.input    ${OUT}/schaum4.input \
${OUT}/schaum5.input  ${OUT}/schaum6.input    ${OUT}/schaum7.input \
${OUT}/schaum8.input  ${OUT}/schaum9.input    ${OUT}/schaum10.input \
${OUT}/schaum11.input ${OUT}/schaum12.input   ${OUT}/schaum13.input \
${OUT}/schaum14.input ${OUT}/schaum15.input   ${OUT}/schaum16.input \
${OUT}/schaum17.input ${OUT}/schaum18.input   ${OUT}/schaum19.input \
${OUT}/schaum20.input ${OUT}/schaum21.input   ${OUT}/schaum22.input \
${OUT}/schaum23.input ${OUT}/schaum24.input   ${OUT}/schaum25.input \
${OUT}/schaum26.input ${OUT}/schaum27.input   ${OUT}/schaum28.input \
${OUT}/schaum29.input ${OUT}/schaum30.input   ${OUT}/schaum31.input \
${OUT}/schaum32.input ${OUT}/schaum33.input   ${OUT}/schaum34.input \
${OUT}/saddle.input \
${OUT}/scherk.input   ${OUT}/scope.input      ${OUT}/seccsc.input \
${OUT}/segbind.input  ${OUT}/seg.input        ${OUT}/series2.input \
${OUT}/series.input   ${OUT}/sersolve.input   ${OUT}/set.input \
${OUT}/setcmd.input   ${OUT}/shannonmatrix.input \
```

```
        ${OUT}/simplify.input \
        ${OUT}/sincos.input   ${OUT}/sinhcosh.input \
        ${OUT}/sincosex.input ${OUT}/sininv.input     ${OUT}/sinsin.input \
        ${OUT}/sinsin2.input  ${OUT}/sint.input       ${OUT}/skew.input \
        ${OUT}/slowint.input  ${OUT}/solveperf.input \
        ${OUT}/solvetra.input   ${OUT}/space3.input \
        ${OUT}/spiral.input \
        ${OUT}/sqmatrix.input ${OUT}/sqrt3.input \
        ${OUT}/sregset.input  ${OUT}/stbl.input \
        ${OUT}/stream2.input  ${OUT}/stream.input     ${OUT}/streams.input \
        ${OUT}/string.input   ${OUT}/strtbl.input     ${OUT}/summation.input \
        ${OUT}/symbol.input \
        ${OUT}/synonym.input  ${OUT}/t111293.input \
        ${OUT}/table.input    ${OUT}/tancot.input     ${OUT}/tanhcoth.input \
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        ${OUT}/as-eg4.input   ${OUT}/as-eg5.input     ${OUT}/as-eg6.input
```

```
#   This viewport has already been closed!
VIEWPORT=${OUT}/graphics.input

# Error: Value stack overflow.
VALUESTACK=${OUT}/images2a.input ${OUT}/images2.input  ${OUT}/images5a.input \
           ${OUT}/images5.input  ${OUT}/images8a.input ${OUT}/images8.input  \
           ${OUT}/mult2d.input   ${OUT}/plotlist.input

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${DOC}/regset.input.dvi      ${DOC}/repa6.input.dvi      \
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${DOC}/ribbonsnew.input.dvi  \
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${DOC}/rich2.input.dvi      \
${DOC}/rich3a.input.dvi      ${DOC}/rich3b.input.dvi \
${DOC}/rich3c.input.dvi      ${DOC}/rich3d.input.dvi \
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${DOC}/rich3g.input.dvi      ${DOC}/rich3h.input.dvi \
${DOC}/rich3i.input.dvi      ${DOC}/rich3j.input.dvi \
${DOC}/rich3k.input.dvi      ${DOC}/rich3l.input.dvi \
${DOC}/rich3m.input.dvi      ${DOC}/rich3n.input.dvi \
${DOC}/rich3o.input.dvi      ${DOC}/rich3p.input.dvi \
${DOC}/rich3q.input.dvi      ${DOC}/rich3r.input.dvi \
${DOC}/rich3s.input.dvi      ${DOC}/rich3t.input.dvi \
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${DOC}/rich4e.input.dvi      ${DOC}/rich4f.input.dvi \
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${DOC}/rich8d.input.dvi      ${DOC}/rich9a.input.dvi \
${DOC}/rich9b.input.dvi      ${DOC}/rich10a.input.dvi \
${DOC}/rich10b.input.dvi     ${DOC}/rich10c.input.dvi \
```

```
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${DOC}/rich11e.input.dvi  \
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${DOC}/rich12c.input.dvi ${DOC}/rich12d.input.dvi \
${DOC}/rich12e.input.dvi ${DOC}/rich12f.input.dvi  \
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${DOC}/richder2.input.dvi  ${DOC}/richder3a.input.dvi \
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${DOC}/richder3d.input.dvi ${DOC}/richder3e.input.dvi \
${DOC}/richder3f.input.dvi ${DOC}/richder3g.input.dvi \
${DOC}/richder3h.input.dvi ${DOC}/richder3i.input.dvi \
${DOC}/richder3j.input.dvi ${DOC}/richder3k.input.dvi \
${DOC}/richder3l.input.dvi ${DOC}/richder3m.input.dvi \
${DOC}/richder3n.input.dvi ${DOC}/richder3o.input.dvi \
${DOC}/richder3p.input.dvi ${DOC}/richder3q.input.dvi \
${DOC}/richder3r.input.dvi ${DOC}/richder3s.input.dvi \
${DOC}/richder3t.input.dvi ${DOC}/richder4a.input.dvi \
${DOC}/richder4b.input.dvi ${DOC}/richder4c.input.dvi \
${DOC}/richder4d.input.dvi ${DOC}/richder4e.input.dvi \
${DOC}/richder4f.input.dvi ${DOC}/richder5.input.dvi \
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${DOC}/richder6c.input.dvi ${DOC}/richder6d.input.dvi \
${DOC}/richder6e.input.dvi \
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${DOC}/richder12e.input.dvi ${DOC}/richder12f.input.dvi \
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${DOC}/richhyper300-399.input.dvi \
${DOC}/richhyper400-499.input.dvi \
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${DOC}/richhyper600-699.input.dvi \
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${DOC}/richhyper1000-1098.input.dvi \
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${DOC}/richinvhyper100-199.input.dvi \
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${DOC}/richspecfunc000-022.input.dvi \
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${DOC}/richtrig200-299.input.dvi \
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${DOC}/schaum5.input.dvi     ${DOC}/schaum6.input.dvi \
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${DOC}/s13acf.input.dvi      ${DOC}/s13adf.input.dvi     \
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${DOC}/s17ahf.input.dvi      ${DOC}/s17ajf.input.dvi     \
${DOC}/s17akf.input.dvi      ${DOC}/s17dcf.input.dvi     \
```

```
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${DOC}/s18dcf.input.dvi      ${DOC}/s18def.input.dvi     \
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${DOC}/s21bcf.input.dvi      ${DOC}/s21bdf.input.dvi     \
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${DOC}/scope.input.dvi       ${DOC}/seccsc.input.dvi     \
${DOC}/segbind.input.dvi    \
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${DOC}/series.input.dvi      ${DOC}/sersolve.input.dvi   \
${DOC}/set.input.dvi         ${DOC}/setcmd.input.dvi     \
${DOC}/shannonmatrix.input.dvi ${DOC}/simplify.input.dvi \
${DOC}/sincos.input.dvi     \
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${DOC}/sininv.input.dvi      ${DOC}/sinsin2.input.dvi    \
${DOC}/sinsin.input.dvi      ${DOC}/sint.input.dvi       \
${DOC}/skew.input.dvi        ${DOC}/slowint.input.dvi    \
${DOC}/solveperf.input.dvi \
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${DOC}/sregset.input.dvi    \
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${DOC}/tancot.input.dvi      ${DOC}/tanhcoth.input.dvi   \
${DOC}/tbagg.input.dvi       ${DOC}/telford.input.dvi    \
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${DOC}/torus.input.dvi       ${DOC}/testpackage.input.dvi \
${DOC}/testprob.input.dvi   \
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${DOC}/tpiezas002.input.dvi \
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${DOC}/triglim.input.dvi     ${DOC}/tschirn.input.dvi    \
${DOC}/tsetcatbutcher.input.dvi    \
${DOC}/tsetcatchemical.input.dvi   \
${DOC}/tsetcatvermeer.input.dvi    \
${DOC}/tuplebug.input.dvi \
${DOC}/tutchap1.input.dvi    ${DOC}/tutchap2.input.dvi   \
${DOC}/tutchap3.input.dvi    ${DOC}/tutchap4.input.dvi   \
```

```
  ${DOC}/tutchap67.input.dvi   ${DOC}/typetower.input.dvi  \
  ${DOC}/typo.input.dvi       \
  ${DOC}/uniseg.input.dvi     \
  ${DOC}/up.input.dvi         \
  ${DOC}/vector.input.dvi      ${DOC}/vectors.input.dvi    \
  ${DOC}/viewdef.input.dvi     ${DOC}/void.input.dvi       \
  ${DOC}/wester.input.dvi      ${DOC}/wiggle.input.dvi     \
  ${DOC}/wutset.input.dvi      \
  ${DOC}/xpoly.input.dvi       ${DOC}/xpr.input.dvi        \
  ${DOC}/wangeez.input.dvi     ${DOC}/zimmbron.input.dvi  \
  ${DOC}/zdsolve.input.dvi     ${DOC}/zimmer.input.dvi     \
  ${DOC}/zlindep.input.dvi

all: ${FILES} ${FILES2} ${ASFILES} ${RICHINPUT} regress ${DOCFILES}
@echo 1 finished ${IN}

\getchunk{genericRules}

use:
@echo si18 making ${OUT} from ${IN}

regress:
@echo si19 making ${MID}
@ ${BOOKS}/tanglec ${IN}/Makefile.pamphlet "regression tests" \
          >${MID}/Makefile
@ echo 3a tpdhere parallel making ${MID}
@ echo 3b tpdhere parallel making ${MID}
( cd ${MID}; ${ENV} ${MAKE} ${TESTSET} )

bug:
@echo si20 making ${OUT} from ${IN}

document:
@echo si21 documenting ${OUT}

clean:
@echo si22 cleaning ${MID}
@rm -rf ${MID}
@echo si23 cleaning ${OUT}
@rm -rf ${OUT}
@rm -f Makefile Makefile.dvi
```

———-

References

[1] nothing