How to compile PeakFQ on Linux

First, install the Intel Fortran Compiler.

You can download the incomplete source code of PeakFQ from its website. Here, I'll use PeakFQ_7.5.1.src.zip. Visit its GitHub repository.

compile_peakfq.sh

```
#!/bin/sh

# download source code
wget
https://water.usgs.gov/software/PeakFQ/code/7.5.1/PeakFQ_7.5.1.src.zip

# unzip it
mkdir -p ~/usr/local/src
unzip PeakFQ_7.5.1.src.zip -d ~/usr/local/src
cd ~/usr/local/src
mv PeakFQ_7.5.1.src/src/FORTRAN peakfq
rm -rf PeakFQ_7.5.1.src
cd peakfq

# rename all filenames to lowercase
for i in *.*; do
  j=$(echo $i | tr A-Z a-z)
  [ $i = $j ] || mv $i $j
done

# rename include and module names in source files to lowercase
for i in *.*; do
  grep -q ".*.INC'" $i || continue
  for j in $(grep ".*.INC'" $i | sort -u | sed 's/\r//;
'"s/^[^']*'\|'$//g"); do
    k=$(echo $j | tr A-Z a-z)
    sed -i "s/$j/$k/" $i
  done
done

# move DENYNONE from ACTION to SHARE
sed -Ei "s/(, )(DENYNONE)/'\1SHARE='\2/" wdoppc90.for

# comment out non-existent modules and data type
sed -Ei 's/^(.*(KERNEL32|T_OVERLAPPED))/!\1/' scenmod.f90

# comment out Windows functions
sed -Ei 's/^(.*(PeekNamedPipe|ReadFile|WriteFile))/!\1/' scenmod.f90

# fix disclaimer line
```

```
sed -i "/^ *WRITE(DISCLM(1)/a \        DISCLM(2) = ''\r" j407xe.for

# reenable default generalized skew computation
sed -Ei 's/^C(.*GENSKU *=.*)/\1/; s/^Cprh( {6}AUX)/\1/; s/^(
{6}AUX\(1\) = -999)/C\1/' j407xe.for

# download missing files
for i in \
  adwdm/cfbuff.inc \
  adwdm/cdrloc.inc \
  adwdm/fmsgwd.inc \
  adwdm/utwdmd.for \
  adwdm/utwdmf.for \
  adwdm/utwdt1.for \
  adwdm/wdatm1.for \
  adwdm/wdmchk.for \
  adwdm/wdmess.for \
  wdm/ctsbuf.inc \
  wdm/cwdmid.inc \
  wdm/cwtsds.inc \
  wdm/tsbufr.for \
  wdm/wdatm2.for \
  wdm/wdatrb.for \
  wdm/wdatru.for \
  wdm/wdbtch.for \
  wdm/wdmid.for \
  wdm/wdtms1.for \
  wdm/wdtms2.for \
  ; do
  wget
https://svn.oss.deltares.nl/repos/openda/trunk/model_hspf/fortran/liban
ne4.0/src/$i
done

# dos to unix
for i in * */*; do
  sed -i 's/\r//' $i
done

# create main.f90
cat << 'EOT' > main.f90
character(len=256) :: specfile

if(command_argument_count().eq.0) then
  write(*,*) "Usage: peakfq specfile"
else
  call get_command_argument(1, specfile)
  call peakfq(specfile)
endif
end
```

```
EOT

# create Makefile
cat << 'EOT' > Makefile
FC=ifx
LDFLAGS=-nofor-main

all: peakfq

clean:
    $(RM) *.o EMAUtil/*.o *.mod peakfq

peakfq: \
    main.o \
    EMAUtil/dcdflib1.o \
    EMAUtil/imslfake.o \
    EMAUtil/probfun.o \
    compspecs.o \
    datsys90.o \
    emafit.o \
    emathresh.o \
    j407wc.o \
    j407xe.o \
    ktutil.o \
    peakfq.o \
    pkfqsta.o \
    pkwdm.o \
    qfdprs.o \
    scenmod.o \
    stationdata.o \
    stgaus.o \
    stutil.o \
    tsbufr.o \
    utchar.o \
    utcpgn.o \
    utdate.o \
    utgnrl.o \
    utj407.o \
    utnumb.o \
    utstat.o \
    utwdmd.o \
    utwdmf.o \
    utwdt1.o \
    wdatm1.o \
    wdatm2.o \
    wdatrb.o \
    wdatru.o \
    wdbtch.o \
    wdmchk.o \
    wdmess.o \
    wdmid.o \
```

```
    wdoppc90.o \
    wdpeak.o \
    wdtble.o \
    wdtms1.o \
    wdtms2.o
    $(FC) $(LDFLAGS) -o $@ $^

peakfq.o: emathresh.o compspecs.o

pkfqsta.o: scenmod.o

j407xe.o: emathresh.o stationdata.o

j407wc.o: emathresh.o

%.o: %.f90
    $(FC) $(FFLAGS) -c -o $@ $<

%.o: %.for
    $(FC) $(FFLAGS) -c -o $@ $<
EOT

# build
make

# install PeakFQ for Windows; find and copy pkfqms.wdm in lowercase
# download it from this website
wget https://clawiki.isnew.info/_media/howtos/pkfqms.zip
unzip pkfqms.zip
rm pkfqms.zip
```

You don't need to run this command, but I used it to find undefined references:

```
# see what symbols are undefined
for i in $(make &> /dev/stdout | grep "undefined reference" | sed 's/.*`//;
s/_.*//' | sort -u); do
  if ! grep -qiE "(function|subroutine) *$i" *.* */*.*; then
    echo "$i: NOT FOUND"
  fi
done
```