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.

compile_peakfq.sh

```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 ] && continue
  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'" $i | sort -u | fromdos | sed
"s/^[^']*'\|'$//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/i' scenmod.f90
```

```bash
# 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/libanne4.0/src/$i
done

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

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

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 "NOT FOUND $i"
  fi
done
```