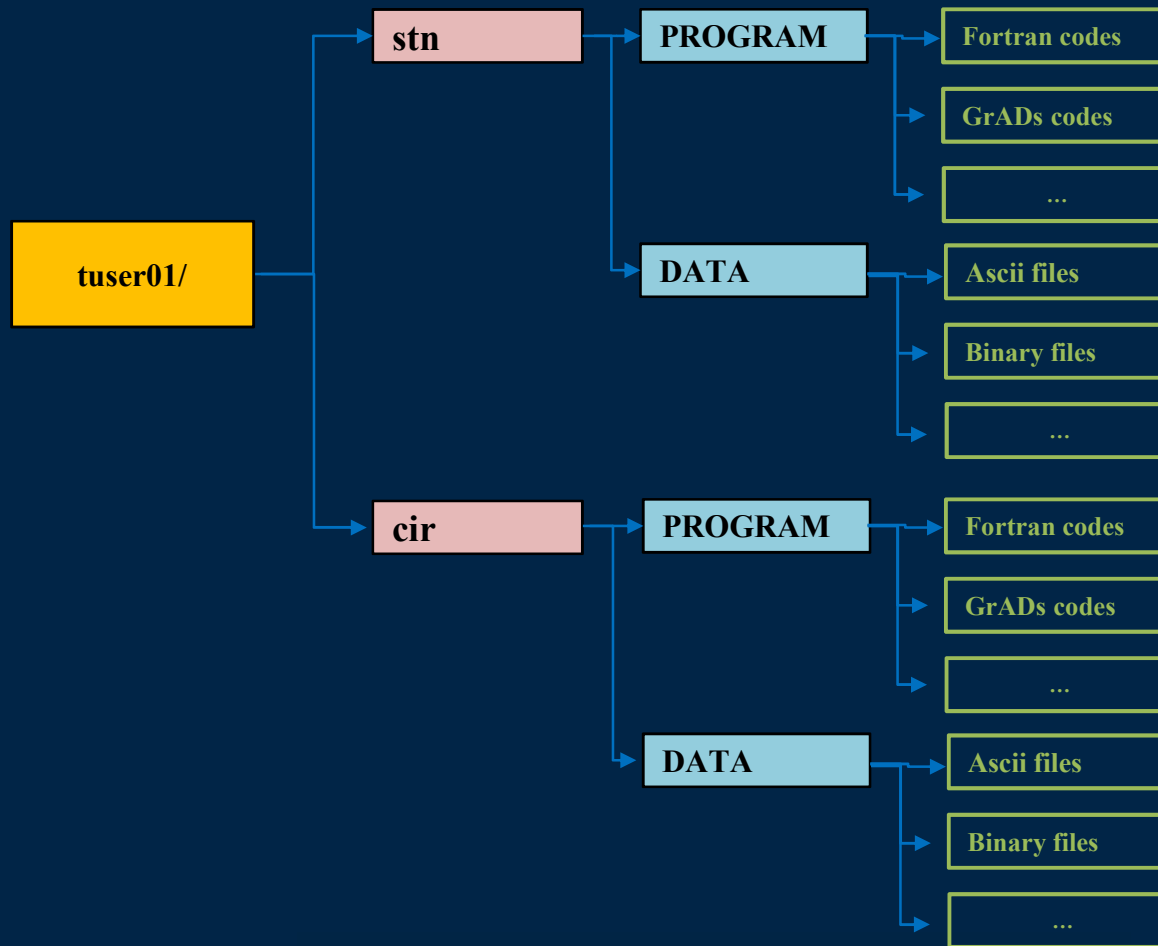
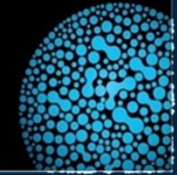


Station data

Setup



Data



cir

41.OLR.198101201012.noLY
41.mslp.198101201012.noLY
41.U850.198101201012.noLY
41.U200.198101201012.noLY
41.V850.198101201012.noLY
41.V200.198101201012.noLY
41.Z500.198101201012.noLY

34.BSISO.INDEX.PHASE.txt

stn

31.P.KR_8110_sta.asc
51.station89.txt

34.BSISO.INDEX.PHASE.txt

52.BSISO1.stn.compctl
52.BSISO2.stn.compctl

maskfile.MA
mask.MA.ctl

Rule on File Naming



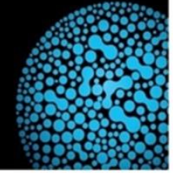
Nation	Abbrev.
Republic of Korea	KR
Pakistan	PK
Myanmar	MM
Thailand	TH
Malaysia	MY
Indonesia	ID
Vietnam	VN
India	IND
PNG	PNG
Taiwan	TPE
Bangladesh	BGD

Variable	Abbrev.
Temperature	T
Precipitation	P

Variable.Nation

Ex> P.KR → **P.VN**

Rule on File Naming



C:\HandsOn\stn\DATA

31.P.KR_8110_sta.asc

51.station89.txt

34.BSISO.INDEX.PHASE.txt

52.BSISO1.stn.comp.ctl

52.BSISO2.stn.comp.ctl

maskfile.MA

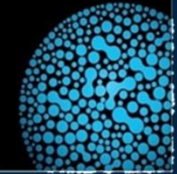
mask.MA.ctl

P.KR → P.VN

8110 → 198101201012

89 → 55

PROGRAM



cir

11.cir.ANO1.f90

12.cir.ANO2.f90

14.cir.BSISO1.COMP.f90

14.cir.BSISO2.COMP.f90

16.cir.BSISO1.COMP.gs

16.cir.BSISO2.COMP.gs

stn

01.stn.ANO1.f90

02.stn.ANO2.f90

04.stn.BSISO1.COMP.f90

04.stn.BSISO2.COMP.f90

05.stn.GSform.BSISO1.f90

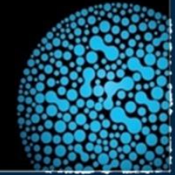
05.stn.GSform.BSISO2.f90

06.stn.BSISO1.COMP.gs

06.stn.BSISO2.COMP.gs

Anomaly Calculation

01.stn.ANO1.f90



Removal of the first three harmonics in climatological annual cycle

#1. Extracting climatology

#2. Extracting first three harmonics in climatological annual cycle

	Input	Code	Output
1. Anomaly & climatology	31.P.KR_8110_sta.asc	<i>01.stn.ANO1.f90 (21.PARA.H)</i>	32.P.KR.CLIM.asc 32.P.KR.198101201012.ANOS1.daily.asc
2. Removal of moving average	32.P.KR.198101201012.ANOS1.daily.asc	<i>02.stn.ANO2.f90 (21.PARA.H)</i>	33.P.KR.198101201012.ANOS2.daily.asc
3. Separate BSISO indices into 8 phases	33.P.KR.198101201012.ANOS2.daily.asc 34.BSISO.INDEX.PHASE.txt	<i>03.BSISO.PHS.amp1.5.MJJASO.f90</i>	BSISO1.MJJASO.amp1.5.Phase1~8 BSISO2.MJJASO.amp1.5.Phase1~8
4.1 Composite variable	BSISO1.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.asc	<i>04.stn.BSISO1.COMP.f90</i>	35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc
4.2 Composite variable	BSISO2.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.asc	<i>04.stn.BSISO2.COMP.f90</i>	36.P.KR.19812010.MJJASO.BSISO2.amp1.5.COMP.asc

Anomaly [01.stn.ANO1.f90]



```
01.stn.ANO1.f90 - Code::Blocks 16.01
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Management
Projects Symbols Files
Workspace
Start here x 01.stn.ANO1.f90 x
1 include "C:\HandsOn\stn\PROGRAM\21.PARA.H"
2 integer :: isnum(ny)
3 real :: val(ny,ntot), ano(ny,ntot)
4 real :: gd(nx,ny), ave(nx,ny), num(nx,ny), var(nx,ny)
5 real :: xx(nx,ny,nday), yy(nday), xano(nday)
6 real :: clim1(nx,ny,nday), clim2(nx,ny,nday)
7 character*8 :: crec
8
9 OPEN(11,file='C:\HandsOn\stn\DATA\31.P.KR_8110_sta.asc',status='old')
10
11 open (1,file='C:\HandsOn\stn\DATA\32.P.KR.198101201012.ANOS1.daily.asc',status='unknown')
12 open (2,file='C:\HandsOn\stn\DATA\32.P.KR.CLIM.asc',status='unknown')
13
14 !-----READ Station Data
15 read(11,666) crec,(isnum(i),i=1,89)
16 666 FORMAT ( a8,89i11 )
17
18 jj=0
19 do kyr=nyri,nyrf
20 do iday=1,nday
21 jj=jj+1
22 read(11,333) iyr,imo,idy,(val(i,jj),i=1,89)
23 enddo
24 enddo
25
26 333 FORMAT ( i4.4,i2.2,i2.2,89f11.5 )
27
28 !-----Climatology (1981-2010)
Logs & others
Search results x Cccc x Build log x Build messages x CppCheck x CppCheck messages x Cscope x Debugger x DoxyBlocks x Fortran info x Closed files list x Thread search
File Line Message
Windows (CR+LF) WINDOWS-1252 Line 27, Column 1 Insert Read/Write default
2:59 PM 7/20/2018
```

Anomaly [21.PARA.H]



```
integer,parameter :: nx=1 , ny=89
integer,parameter :: nyri=1981, nyri2=1981, nyrf=2010, nyr=nyrf-nyri
integer,parameter :: nday=365, ndayf=365
integer,parameter :: ntot=nyr*nday+ndayf
data
    dmiss/-999.0000/
~
~
~
```

The number of your station
Analysis period (Start year, End year)

Ex:VN) ny=55
nyri=1981, nyrf=2010

Anomaly [01.stn.ANO1.f90]



```
1  include "C:\HandsOn\stn\PROGRAM\21.PARA.H"
2  integer :: isnum(ny)
3  real    :: val(ny,ntot), ano(ny,ntot)
4  real    :: gd(nx,ny), ave(nx,ny), num(nx,ny), var(nx,ny)
5  real    :: xx(nx,ny,nday), yy(nday), xano(nday)
6  real    :: clim1(nx,ny,nday), clim2(nx,ny,nday)
7  character*8 :: crec
8
9  OPEN(11,file='C:\HandsOn\stn\DATA\31.P.KR_8110_sta.asc',status='old')
10
11 open (1,file='C:\HandsOn\stn\DATA\32.P.KR.198101201012.ANOS1.daily.asc',status='unknown')
12 open (2,file='C:\HandsOn\stn\DATA\32.P.KR.CLIM.asc',status='unknown')
13
14 !-----READ Station Data
15     read(11,666) crec, (isnum(i),i=1,89)
16 666 FORMAT ( a8,89i11 )
17
18     jj=0
19     do kyr=nyri,nyrf
20     do iday=1,nday
21         jj=jj+1
22         read(11,333) iyr,imo,idy, (val(i,jj),i=1,89)
23     enddo
24     enddo
25
26 333 FORMAT ( i4.4,i2.2,i2.2,89f11.5 )
27
28 !-----Climatology (1981-2010)
```

Ex:VN)
31.P.VN_8110_sta.asc

32.P.VN.198101201012.ANOS1.daily.asc

32.P.VN.CLIM.asc

Anomaly [01.stn.ANO1.f90]

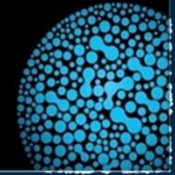


```
e x 01.stn.ANO1.f90 x
10
11 open (1,file='C:\HandsOn\stn\DATA\32.P.KR.198101201012.ANOS1.daily.asc',status='unknown')
12 open (2,file='C:\HandsOn\stn\DATA\32.P.KR.CLIM.asc',status='unknown')
13
14 !-----READ Station Data
15     read(11,666) crec,(isnum(i),i=1,89)
16 666 FORMAT ( a8,89i11 )
17
18     jj=0
19     do kyr=nyri,nyrf
20     do iday=1,nday
21         jj=jj+1
22         read(11,333) iyr,imo,idy,(val(i,jj),i=1,89)
23     enddo
24     enddo
25
26 333 FORMAT ( i4.4,i2.2,i2.2,89f11.5 )
27
28 !-----Climatology (1981-2010)
29 do 100 iday = 1 , nday
30     ave = 0. ; num = 0.
31     do iyr = nyri , nyrf
32         irec=(iyr-nyri)*nday+iday
33         do i=1,89
34             gd(1,i) = val(i,irec)
35         enddo
36         call JAVE1(ave,num,gd,nx,ny,dmiss)
37     enddo
```

Ex:VN)

89 → 55

01.stn.ANO1.f90



Removal of the first three harmonics in climatological annual cycle

#1. Extracting climatology

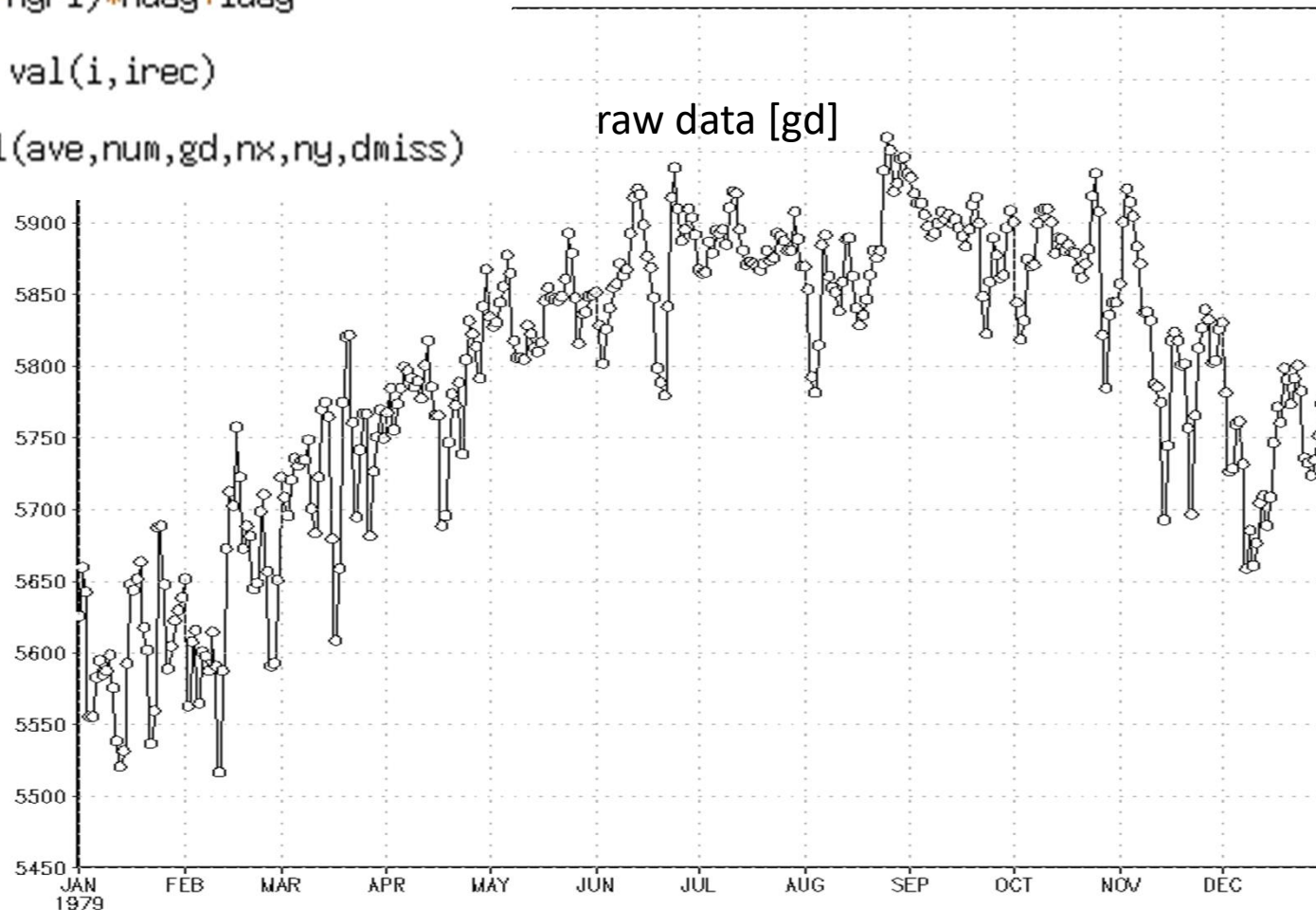
#2. Extracting first three harmonics in climatological annual cycle

Anomaly [01.stn.ANO1.f90]



```
!-----Climatology (1981-2010)
do 100 iday = 1 , nday
  ave = 0. ; num = 0.
  do iyr = nyri , nyrf
    irec=(iyr-nyri)*nday+iday
    do i=1,89
      gd(1,i) = val(i,irec)
    enddo
    call JAVE1(ave,num,gd,nx,ny,dmiss)
  enddo
enddo
```

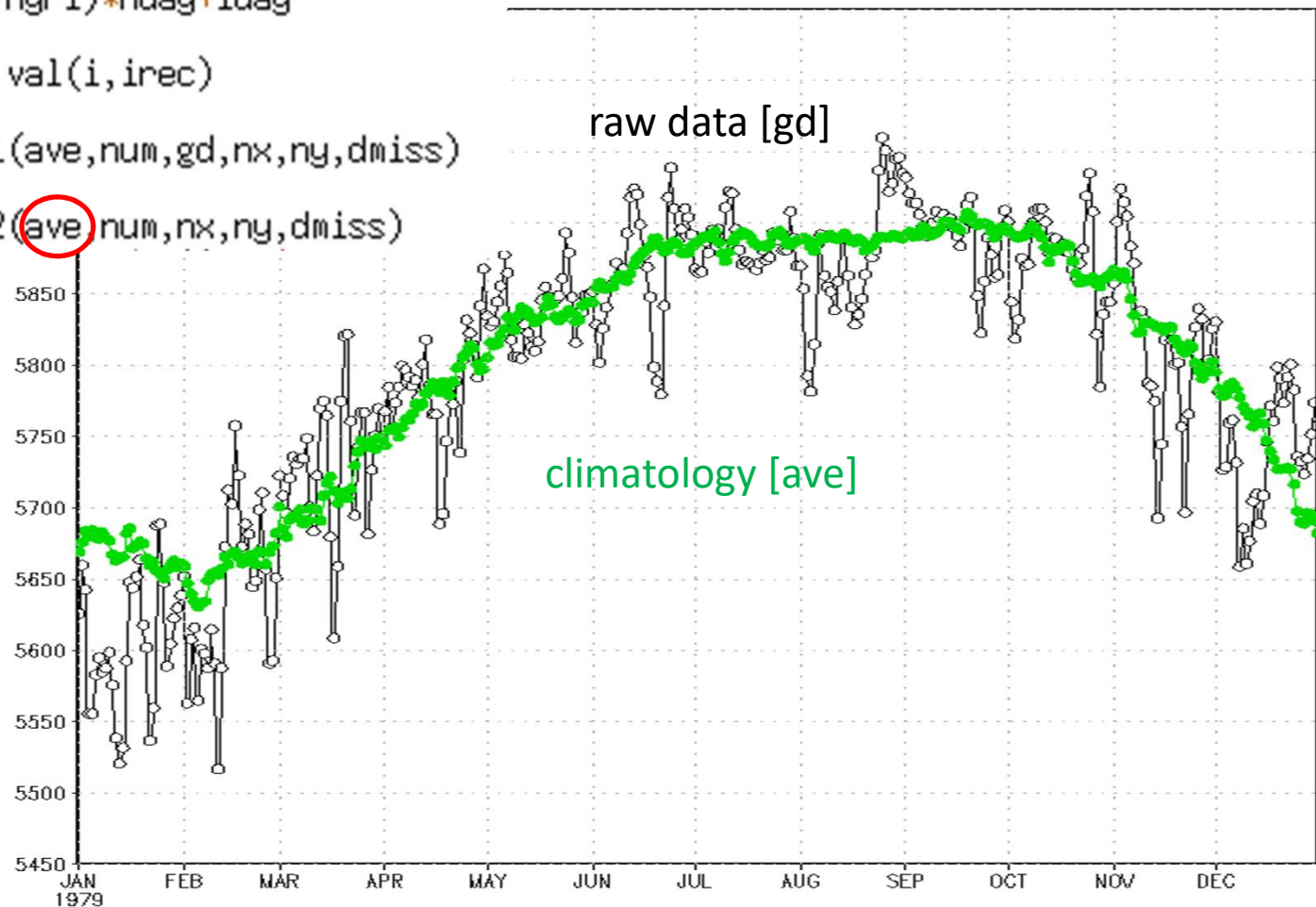
[Z500; 150E, 30N]



Anomaly [01.stn.ANO1.f90]



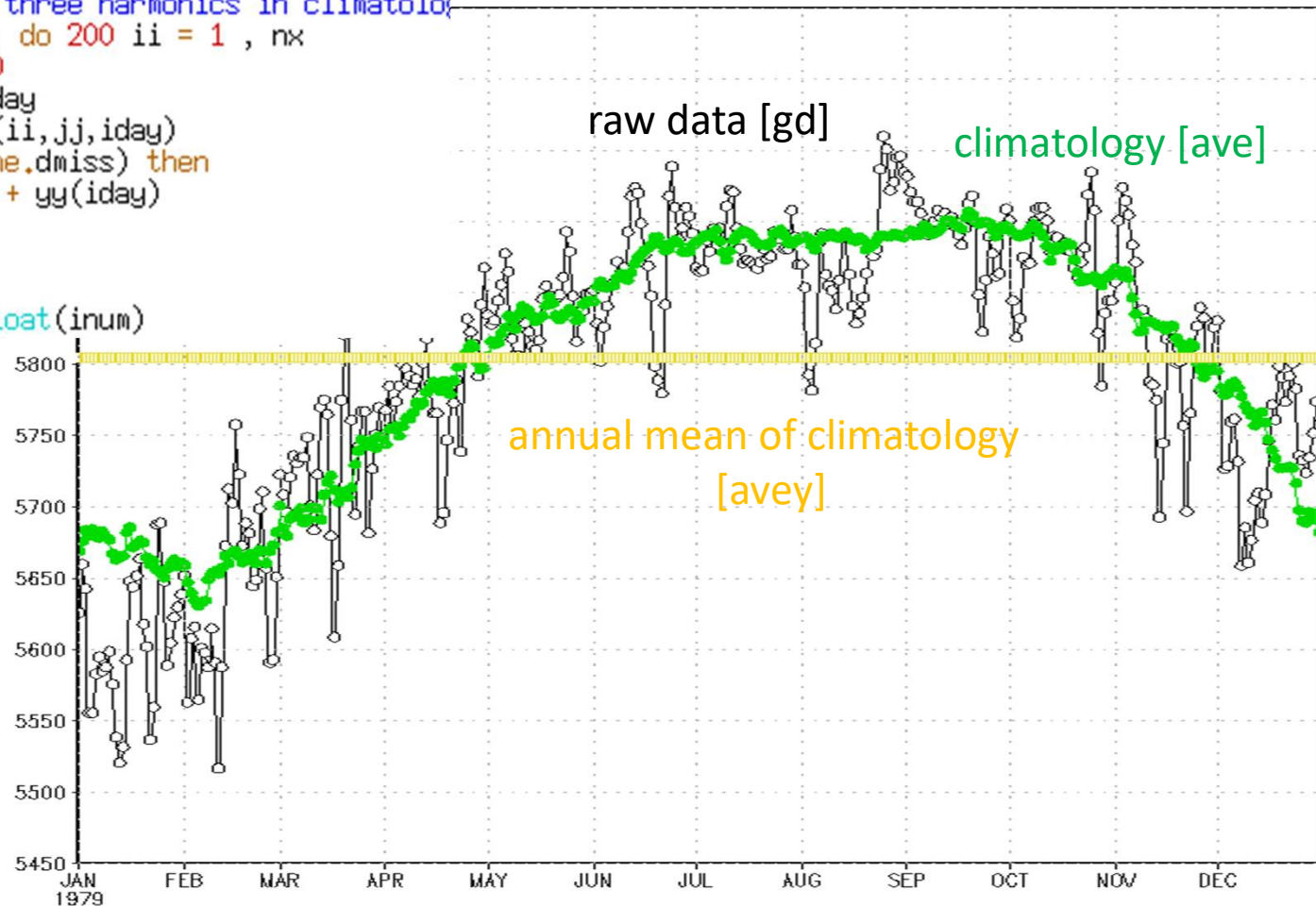
```
!-----Climatology (1981-2010)
do 100 iday = 1 , nday
  ave = 0. ; num = 0.
  do iyr = nyri , nyrf
    irec=(iyr-nyri)*nday+iday
    do i=1,89
      gd(1,i) = val(i,irec)
    enddo
    call JAVE1(ave,num,gd,nx,ny,dmiss)
  enddo
  call JAVE2(ave,num,nx,ny,dmiss)
```



Anomaly [01.stn.ANO1.f90]



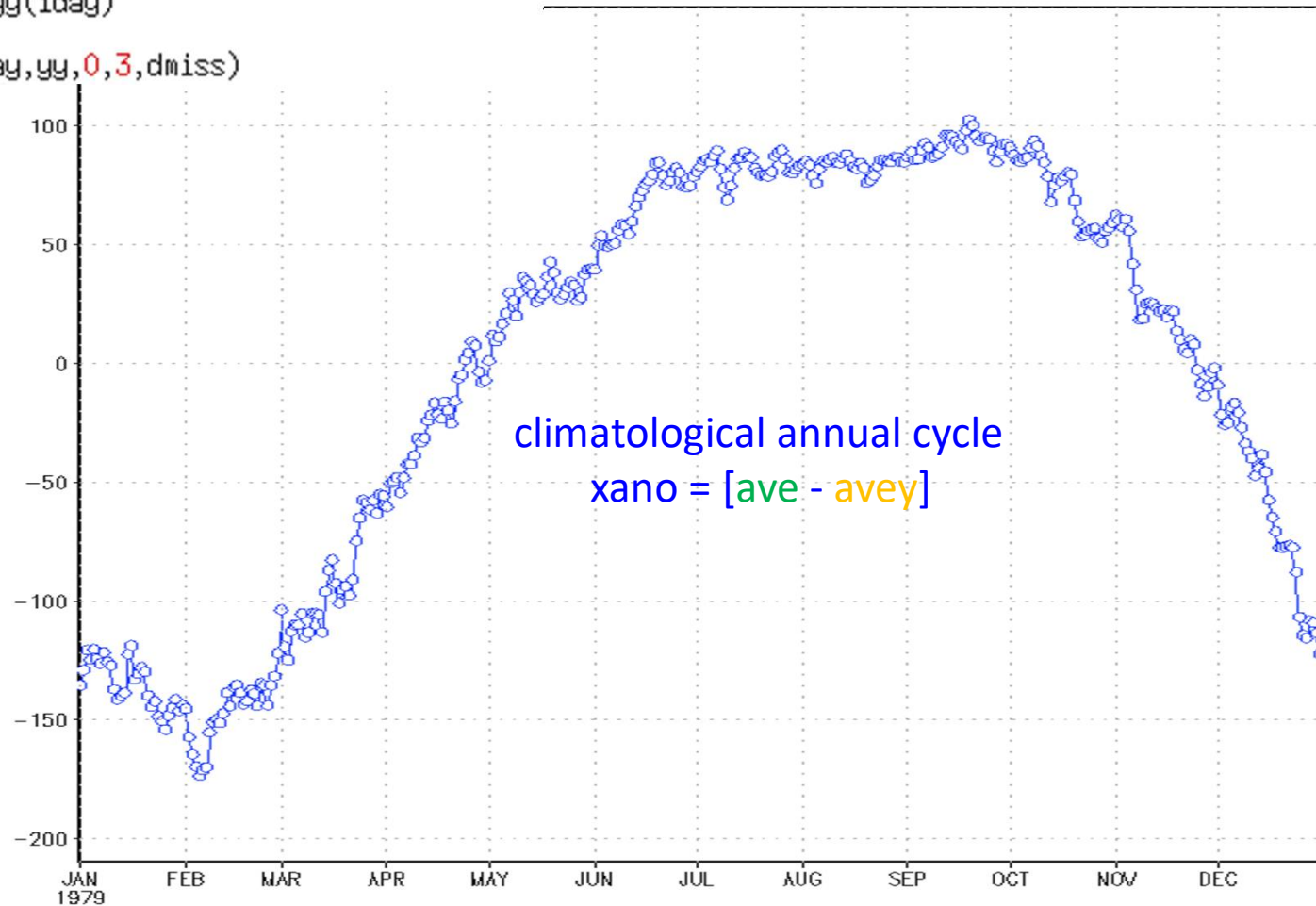
```
39      do jj = 1 , ny; do ii = 1 , nx
40          xx(ii,jj,iday) = ave(ii,jj)
41      enddo;enddo
42  100 continue
43
44      clim1 = dmiss
45      clim2 = dmiss
46
47  !-----The first three harmonics in climatology
48  do 200 jj = 1 , ny; do 200 ii = 1 , nx
49      avey = 0.;inum=0
50      do iday = 1 , nday
51          yy(iday) = xx(ii,jj,iday)
52          if (yy(iday).ne.dmiss) then
53              avey = avey + yy(iday)
54              inum=inum+1
55          endif
56      enddo
57      avey = avey/float(inum)
```



Anomaly [01.stn.ANO1.f90]



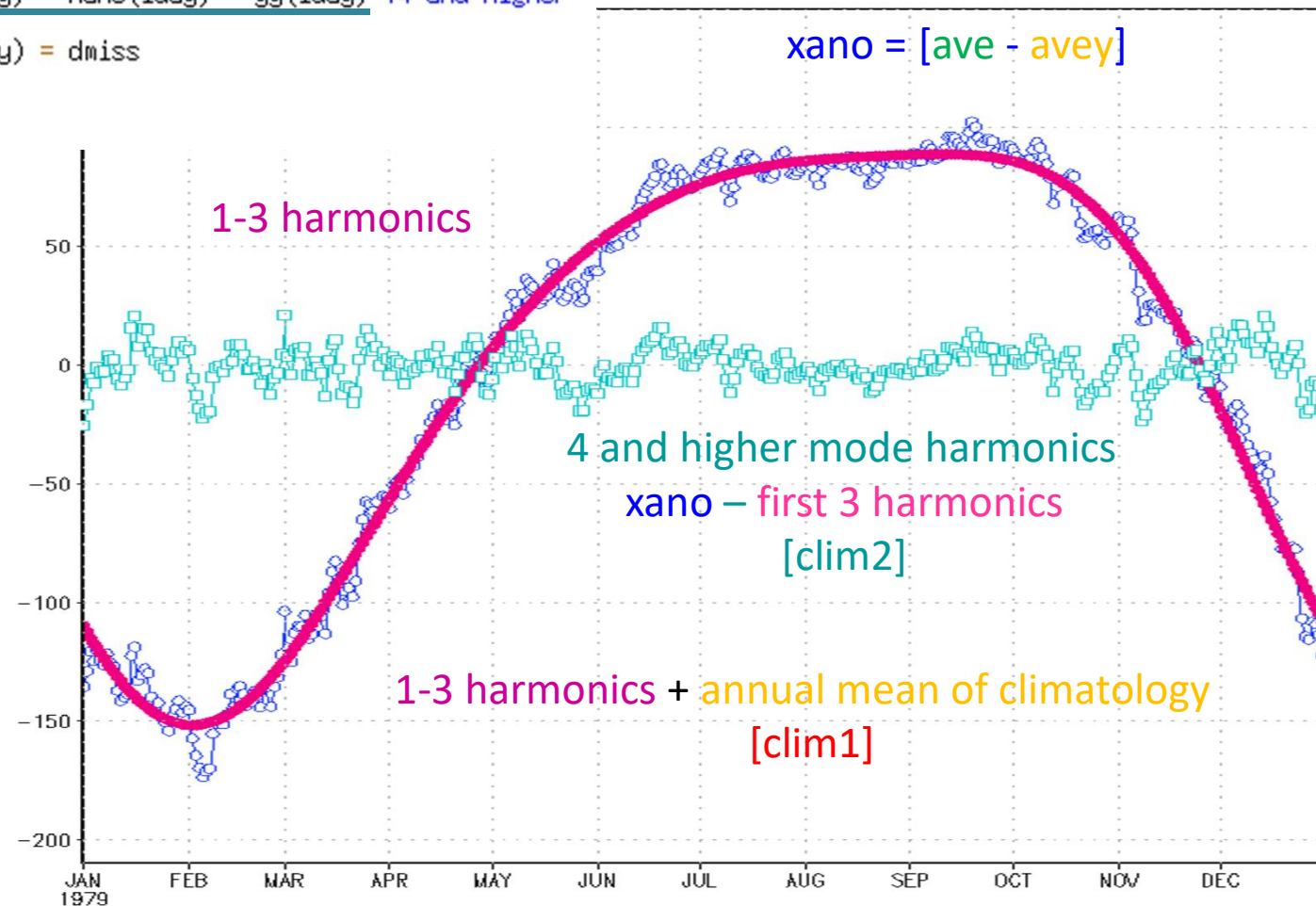
```
58 do iday = 1 , nday
59   if (yy(iday).ne.dmiss.and.avey.ne.dmiss) then
60     yy(iday) = yy(iday) - avey
61   else
62     yy(iday) = dmiss
63   endif
64   xano(iday) = yy(iday)
65 enddo
66 call ffltr(nday,yy,0,3,dmiss)
```



Anomaly [01.stn.ANO1.f90]



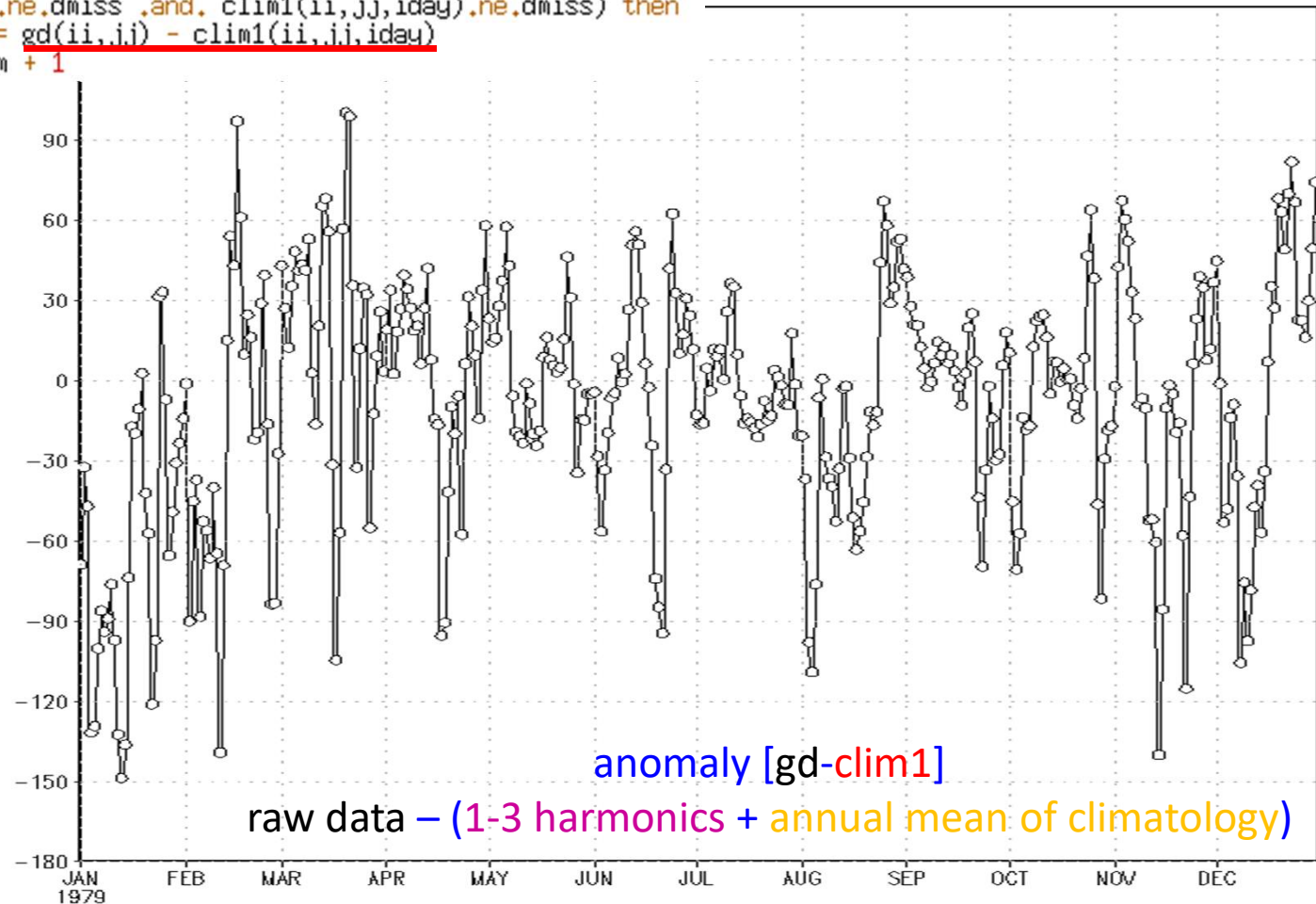
```
66  call ffltr(nday,yy,0.3,dmiss)
67  do iday = 1 , nday
68    if (yy(iday).ne.dmiss.and.avey.ne.dmiss) then
69      clim1(ii,jj,iday) = yy(iday) + avey      !0-3 harmonics
70    else
71      clim1(ii,jj,iday) = dmiss
72    endif
73    if (yy(iday).ne.dmiss.and.xano(iday).ne.dmiss) then
74      clim2(ii,jj,iday) = xano(iday) - yy(iday) !4 and higher
75    else
76      clim2(ii,jj,iday) = dmiss
77    endif
78  enddo
79  200 continue
```



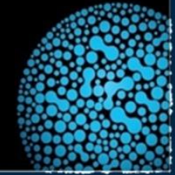
Anomaly [01.stn.ANO1.f90]



```
87 !-----anomaly
88   var = 0.;inum=0
89   do 300 iday = 1 , nday
90     do 10 iyr = nyri , nyrf
91       irec=(iyr-nyri)*nday+iday
92       do i=1,89
93         gd(1,i) = val(i,irec)
94       enddo
95       do jj = 1 , ny; do ii = 1 , nx
96         if (gd(ii,jj).ne.dmiss .and. clim1(ii,jj,iday).ne.dmiss) then
97           gd(ii,jj) = gd(ii,jj) - clim1(ii,jj,iday)
98           inum = inum + 1
```



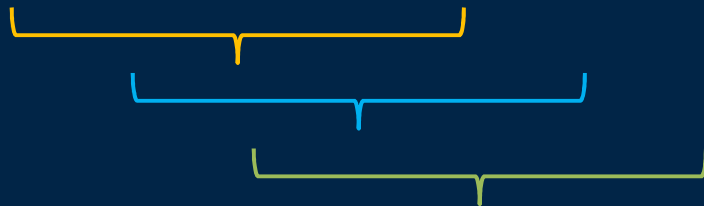
02.stn.ANO2.f90



Removal of the effect of ENSO signal through subtracting last 120-day mean

Julian day

1	2	...	120	121	122	123	124	125	126	127	128	129	130	...
---	---	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----



	Input	Code	Output
1. Anomaly & climatology	31.P.KR_8110_sta.asc	<i>01.stn.ANO1.f90 (21.PARA.H)</i>	32.P.KR.CLIM.asc 32.P.KR.198101201012.ANOS1.daily.asc
2. Removal of moving average	32.P.KR.198101201012.ANOS1.daily.a sc	<i>02.stn.ANO2.f90 (21.PARA.H)</i>	33.P.KR.198101201012.ANOS2.daily.as c
3. Separate BSISO indices into 8 phases	33.P.KR.198101201012.ANOS2.daily.asc 34.BSISO.INDEX.PHASE.txt	<i>03.BSISO.PHS.amp1.5.MJJASO.f90</i>	BSISO1.MJJASO.amp1.5.Phase1~8 BSISO2.MJJASO.amp1.5.Phase1~8
4.1 Composite variable	BSISO1.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.asc	<i>04.stn.BSISO1.COMP.f90</i>	35.P.KR.19812010.MJJASO.BSISO1.amp1. 5.COMP.asc
4.2 Composite variable	BSISO2.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.asc	<i>04.stn.BSISO2.COMP.f90</i>	36.P.KR.19812010.MJJASO.BSISO2.amp1. 5.COMP.asc

Anomaly [02.stn.ANO2.f90]



```
02.stn.ANO2.f90 x
1  include "C:\HandsOn\stn\PROGRAM\21.PARA.H"
2  real  ::  gd(nx,ny), gd2(nx,ny), ave(nx,ny), num(nx,ny)
3  real  ::  xx(ny,ntot),val(ny,ntot)
4
5  open (11,file='C:\HandsOn\stn\DATA\32.P.KR.198101201012.ANOS1.daily.asc',status='old')
6  open (1,file='C:\HandsOn\stn\DATA\33.P.KR.198101201012.ANOS2.daily.asc',status='unknown')
7
8  !----- READ
9  do iday=1,nday
10 do iyr=nyri,nyrf
11     irec=(iyr-nyri)*nday+iday
12     read(11,553) (val(jj,irec),jj=1,ny)
13 enddo
14 enddo
15 !----- READ
16
17 !----- ANO
18 do 2008 iyr = nyri , nyrf
19     print *, iyr
20     do 100 iday = 1 , nday
21         irec=(iyr-nyri)*nday+iday
22         IF (iyr.eq.nyri .and. iday.le.120) then
23             do jj=1,89
24                 xx(jj,irec)=val(jj,irec)
25             enddo
26         ELSEIF (iyr.eq.nyrf .and. iday.gt.ndayf) then
27             goto 100
28         ELSE
```

Ex:VN)

33.P.VN.198101201012.ANOS2.daily.asc

32.P.VN.198101201012.ANOS1.daily.asc

Anomaly [02.stn.ANO2.f90]



```
17 !----- AND
18 do 2008 iyr = nyri , nyrf
19   print *, iyr
20   do 100 iday = 1 , nday
21     irec=(iyr-nyri)*nday+iday
22     IF (iyr.eq.nyri .and. iday.le.120) then
23       do jj=1,89
24         xx(jj,irec)=val(jj,irec)
25       enddo
26     ELSEIF (iyr.eq.nyrf .and. iday.gt.ndayf) then
27       goto 100
28     ELSE
29       do jj=1,89
30         gd(1,jj)=val(jj,irec)
31       enddo
32       ave = 0.; num = 0.
33       do imov = 0 , 119   !last 120-day mean
34         jrec=irec-imov
35         do jj=1,89
36           gd2(1,jj) = val(jj,jrec)
37         enddo
38         call JAVE1(ave,num,gd2,nx,ny,dmiss)
39       enddo
40       call JAVE2(ave,num,nx,ny,dmiss)
41       DO jj = 1 , ny; DO ii = 1 , nx
42         if (gd(ii,jj).ne.dmiss .and. ave(ii,jj).ne.dmiss) then
43           gd(ii,jj) = gd(ii,jj) - ave(ii,jj)
44         else
45           gd(ii,jj) = dmiss
46         endif
47       ENDDO;ENDDO
48       do jj=1,ny
49         xx(jj,irec) = gd(1,jj)
50       enddo
51     ENDIF
52   100 continue
53 2008 continue
--
```

Ex:VN)

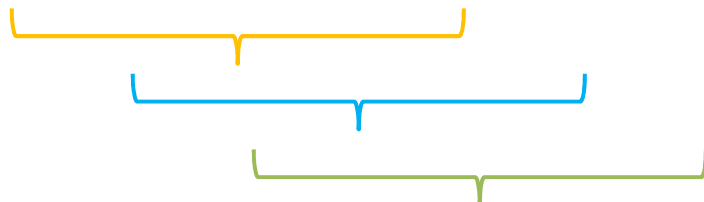
89 → 55

```
--
55 DO iday = 1 , nday
56 DO iyr = nyri , nyrf
57   irec=(iyr-nyri)*nday+iday
58   write(1,443) (xx(jj,irec),jj=1,ny)
59 ENDDO
60 ENDDO
61 443 FORMAT (89f11.4)
62 553 FORMAT (89f11.5)
63
64 stop
65 end
--
```

Anomaly [02.stn.ANO2.f90]

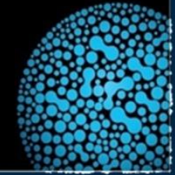


```
17 !----- ANO
18 do 2008 iyr = nyri , nyrf
19   print *, iyr
20   do 100 iday = 1 , nday
21     irec=(iyr-nyri)*nday+iday
22     IF (iyr.eq.nyri .and. iday.le.120) then
23       do jj=1,89
24         xx(jj,irec)=val(jj,irec)
25       enddo
26     ELSEIF (iyr.eq.nyrf .and. iday.gt.ndayf) then
27       goto 100
28     ELSE
29       do jj=1,89
30         gd(1,jj)=val(jj,irec)
31       enddo
32       ave = 0.; num = 0.
33       do imov = 0 , 119 !last 120-day mean
34         jrec=irec-imov
35         do jj=1,89
36           gd2(1,jj) = val(jj,jrec)
37         enddo
38         call JAVE1(ave,num,gd2,nx,ny,dmiss)
39       enddo
40       call JAVE2(ave,num,nx,ny,dmiss)
41     DO jj = 1 , ny; DO ii = 1 , nx
42       if (gd(ii,jj).ne.dmiss .and. ave(ii,jj).ne.dmiss) then
43         gd(ii,jj) = gd(ii,jj) - ave(ii,jj)
44       else
45         gd(ii,jj) = dmiss
46       endif
47     ENDDO;ENDDO
```



Composite Analysis

Flow

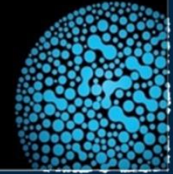


#1. Divide the BSISO indices into 8 phases

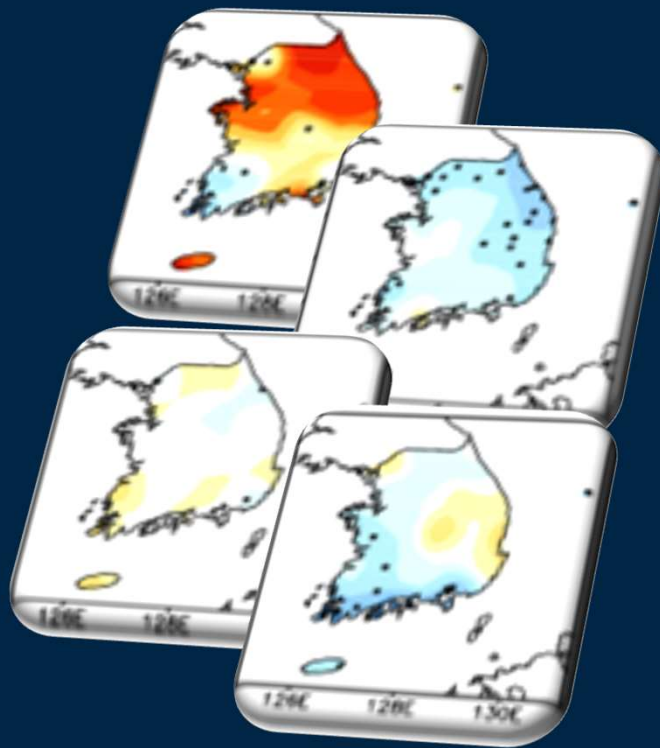
#2. Composite for local precipitation anomaly

04.stn.BSISO1.COMP.f90

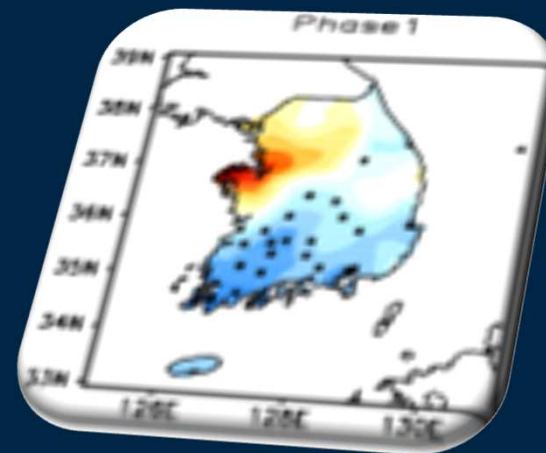
04.stn.BSISO2.COMP.f90



#2. Composite analysis for station data to show local impact of BSISO

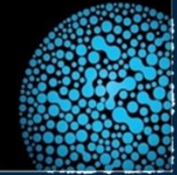


⋮



	Input	Code	Output
1. Anomaly & climatology	31.P.KR_8110_sta.asc	<i>01.stn.ANO1.f90</i> (21.PARA.H)	32.P.KR.CLIM.asc 32.P.KR.198101201012.ANOS1.daily.asc
2. Removal of moving average	32.P.KR.198101201012.ANOS1.daily.asc	<i>02.stn.ANO2.f90</i> (21.PARA.H)	33.P.KR.198101201012.ANOS2.daily.asc
3. Separate BSISO indices into 8 phases	33.P.KR.198101201012.ANOS2.daily.a sc 34.BSISO.INDEX.PHASE.txt	<i>03.BSISO.PHS.amp1.5.MJJASO.f90</i>	BSISO1.MJJASO.amp1.5.Phase1~8 BSISO2.MJJASO.amp1.5.Phase1~8
4.1 Composite variable	BSISO1.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.asc	<i>04.stn.BSISO1.COMP.f90</i>	35.P.KR.19812010.MJJASO.BSISO1.amp1. 5.COMP.asc
4.2 Composite variable	BSISO2.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.asc	<i>04.stn.BSISO2.COMP.f90</i>	36.P.KR.19812010.MJJASO.BSISO2.amp1. 5.COMP.asc

03.BSISO.PHS.amp1.5.MJJASO.f90



#1. Divide the BSISO indices based on 8 phases

BSISO1.MJJASO.amp1.5.Phase1

1981 200	0.021	-1.636	1.636	1
1981 201	0.414	-1.457	1.515	1
1981 202	0.845	-1.356	1.598	1
1981 234	0.039	-1.610	1.610	1
1981 235	0.383	-1.642	1.686	1
1981 295	0.829	-1.304	1.545	1
1982 143	1.117	-1.350	1.752	1
1982 261	0.755	-1.712	1.871	1
1982 262	0.869	-1.493	1.727	1
1982 295	0.063	-1.909	1.910	1
1982 296	0.431	-1.851	1.901	1
1982 297	0.739	-1.756	1.905	1
1982 298	0.900	-1.203	1.502	1
1982 299	1.084	-1.106	1.549	1
1983 233	0.555	-1.441	1.544	1

...

x8

BSISO2.MJJASO.amp1.5.Phase1

1981 198	0.949	-1.812	2.046	1
1981 208	0.674	-1.648	1.781	1
1981 209	1.075	-1.817	2.111	1
1981 212	1.841	-1.844	2.606	1
1981 213	1.705	-2.640	3.143	1
1981 214	1.154	-2.175	2.462	1
1981 257	0.771	-1.626	1.799	1
1981 258	1.397	-1.787	2.268	1
1981 290	0.256	-1.576	1.597	1
1981 299	1.003	-1.527	1.827	1
1982 138	0.034	-1.619	1.619	1
1982 144	1.066	-1.339	1.712	1
1982 145	1.326	-1.541	2.033	1
1982 251	0.855	-1.254	1.518	1
1983 196	1.519	-1.551	2.171	1

...

x8

Composite [03.BSISO.PHS.amp1.5.MJJASO.f90]



```
1 | integer, parameter :: nyr=30, nmode=4
2 | integer, parameter :: ndayt=365, ndayf=365 !!! modify
3 | integer, parameter :: ntot=(nyr-1)*ndayt+ndayf
4 | integer :: iyr, idy, irec, ip, inum, jnum
5 | integer :: ico(8), jco(8)
6 | integer :: iyear(ntot), iday(ntot), ppl(ntot), pp2(ntot)
7 | real    :: pc(nmode,ntot), amp(ntot), amp2(ntot)
8
9 | open (1, file='C:\HandsOn\stn\DATA\34.BSISO.INDEX.PHASE.txt', status='old')
10
11 | open(31, file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase1', status='unknown')
12 | open(32, file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase2', status='unknown')
13 | open(33, file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase3', status='unknown')
14 | open(34, file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase4', status='unknown')
15 | open(35, file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase5', status='unknown')
16 | open(36, file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase6', status='unknown')
17 | open(37, file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase7', status='unknown')
18 | open(38, file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase8', status='unknown')
19 | open(41, file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase1', status='unknown')
20 | open(42, file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase2', status='unknown')
21 | open(43, file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase3', status='unknown')
22 | open(44, file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase4', status='unknown')
23 | open(45, file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase5', status='unknown')
24 | open(46, file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase6', status='unknown')
25 | open(47, file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase7', status='unknown')
26 | open(48, file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase8', status='unknown')
27
28
29 | read(1, *)
```

BSISO1

BSISO2

Composite [03.BSISO.PHS.amp1.5.MJJASO.f90]



```
ico=0; jco=0
irec=0
DO iyr=1,nyr
DO idy=1,ndayt
irec = irec + 1
  IF(amp(irec).ge.1.5.and.idy.ge.121.and.idy.le.304) THEN !---- MJJASO
    DO ip=1,8
      inum = ip
      IF(pp1(irec).eq.ip) THEN
        WRITE(inum+30,100) iyear(irec),iday(irec),pc(1,irec),pc(2,irec),&
&          amp(irec),pp1(irec)
        ico(inum) = ico(inum) + 1
      ENDIF
    ENDDO
  ENDIF
  IF(amp2(irec).ge.1.5.and.idy.ge.121.and.idy.le.304) THEN !---- MJJASO
    DO ip=1,8
      jnum = ip
      IF(pp2(irec).eq.ip) THEN
        WRITE(jnum+40,100) iyear(irec),iday(irec),pc(3,irec),pc(4,irec),&
&          amp2(irec),pp2(irec)
        jco(jnum) = jco(jnum) + 1
      ENDIF
    ENDDO
  ENDIF
ENDDO
ENDDO
```

BSISO1

BSISO2

Composite [03.BSISO.PHS.amp1.5.MJJASO.f90]



```
----- BSISO 1-----  
P1  P2  P3  P4  P5  P6  P7  P8  
211 255 189 159 267 193 309 239
```

```
----- BSISO 2-----  
P1  P2  P3  P4  P5  P6  P7  P8  
225 255 235 209 212 228 225 231
```

Composite [04.BSISO1.COMP.f90]



```
1 |include "C:\HandsOn\stn\PROGRAM\21.PARA.H"  
2 |real    :: pavg(8,ny),val(ny,ntot)  
3 |real    :: imsi  
4 |integer :: inum  
5 |integer :: pdate(8)  
6 |integer,dimension(8,309) :: year, jday  
7 |  
8 |data pdate / 211, 255, 189, 159, 267, 193, 309, 239 /
```

	Input	Code	Output
1. Anomaly & climatology	31.P.KR_8110_sta.asc	<i>01.stn.ANO1.f90</i> <i>(21.PARA.H)</i>	32.P.KR.CLIM.asc 32.P.KR.198101201012.ANOS1.daily.asc
2. Removal of moving average	32.P.KR.198101201012.ANOS1.daily.asc	<i>02.stn.ANO2.f90</i> <i>(21.PARA.H)</i>	33.P.KR.198101201012.ANOS2.daily.asc
3. Separate BSISO indices into 8 phases	33.P.KR.198101201012.ANOS2.daily.asc 34.BSISO.INDEX.PHASE.txt	<i>03.BSISO.PHS.amp1.5.MJJASO.f90</i>	BSISO1.MJJASO.amp1.5.Phase1~8 BSISO2.MJJASO.amp1.5.Phase1~8
4.1 Composite variable	BSISO1.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.a sc	<i>04.stn.BSISO1.COMP.f90</i>	35.P.KR.19812010.MJJASO.BSISO1.am p1.5.COMP.asc
4.2 Composite variable	BSISO2.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.a sc	<i>04.stn.BSISO2.COMP.f90</i>	36.P.KR.19812010.MJJASO.BSISO2.am p1.5.COMP.asc

Composite [04.BSISO1.COMP.f90]



```
1  include "C:\HandsOn\stn\PROGRAM\21.PARA.H"
2  real  :: pavg(8,ny),val(ny,ntot)
3  real  :: imsi
4  integer :: inum
5  integer :: pdate(8)
6  integer,dimension(8,309) :: year, jday
7
8  data pdate / 211, 255, 189, 159, 267, 193, 309, 239 /
9
10 open (11,file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase1',status='old')
11 open (12,file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase2',status='old')
12 open (13,file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase3',status='old')
13 open (14,file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase4',status='old')
14 open (15,file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase5',status='old')
15 open (16,file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase6',status='old')
16 open (17,file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase7',status='old')
17 open (18,file='C:\HandsOn\stn\DATA\BSISO1.MJJASO.amp1.5.Phase8',status='old')
18
19 open (1,file='C:\HandsOn\stn\DATA\33.P.KR.198101201012.ANOS2.daily.asc',status='old')
20 open (33,file='C:\HandsOn\stn\DATA\35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc', &
21 & status='unknown')
22
23 !----- READ Pkor
24 do iday=1,nday
25 do iyr=nyri, nyrf
26 irec=(iyr-nyri)*nday+iday
27 read(1,200) (val(jj,irec),jj=1,ny)
28 enddo
29 enddo
30
31 year = dmiss
32 jday = dmiss
33
34 !----- READ
35 do ip=1,8
36 do ik=1,pdate(ip)
37 imun = 10+ip
38 read(imun,100) year(ip,ik),jday(ip,ik)
39 enddo
40 close (imun)
41 enddo
42 100 FORMAT(2x,i4.4,1x,i3.3)
43 200 FORMAT(89f11.5)
```

Ex:VN)

P.KR → P.VN

Ex:VN)

89 → 55

Composite [04.BSISO2.COMP.f90]



```
1  include "C:\HandsOn\stn\PROGRAM\21.PARA.H"
2  real  :: pavg(8,ny),val(ny,ntot)
3  real  :: imsi
4  integer :: inum
5  integer :: pdate(8)
6  integer,dimension(8,255) :: year, jday
7
8  data pdate / 225, 255, 235, 209, 212, 228, 225, 231 /
9
10 open (11,file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase1',status='old')
11 open (12,file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase2',status='old')
12 open (13,file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase3',status='old')
13 open (14,file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase4',status='old')
14 open (15,file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase5',status='old')
15 open (16,file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase6',status='old')
16 open (17,file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase7',status='old')
17 open (18,file='C:\HandsOn\stn\DATA\BSISO2.MJJASO.amp1.5.Phase8',status='old')
18 open (1,file='C:\HandsOn\stn\DATA\33.P.KR.198101201012.ANOS2.daily.asc',status='old')
19 open (33,file='C:\HandsOn\stn\DATA\36.P.KR.19812010.MJJASO.BSISO2.amp1.5.COMP.asc', &
20 & status='unknown')
21
22
23 !----- READ Pkox
24 do iday=1,nday
25 do iyr=nyri, nyrf
26     irec=(iyr-nyri)*nday+iday
27     read(1,200) (val(jj,irec),jj=1,ny)
28 enddo
29 enddo
30
31 year = dmiss
32 jday = dmiss
33
34 !----- READ
35 do ip=1,8
36 do ik=1,pdate(ip)
37     imun = 10+ip
38     read(imun,100) year(ip,ik),jday(ip,ik)
39 enddo
40     close (imun)
41 enddo
42 100 FORMAT(2x,i4.4,1x,i3.3)
43 200 FORMAT(89f11.5)
```

Ex:VN)

P.KR → P.VN

Ex:VN)

89 → 55

Drawing using GrADS

	Input	Code	Output
5.1 Convert data format from ascii to bin	51.station89.txt 35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc	<i>05.stn.GSform.BSISO1.f90</i>	52.P.KR.MJJASO.19812010.BSISO1.COMP.gsform.dat
5.2 Convert data format from ascii to bin	51.station89.txt 36.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc	<i>05.stn.GSform.BSISO2.f90</i>	52.P.KR.MJJASO.19812010.BSISO2.COMP.gsform.dat
6.1 Display BSISO1	52.BSISO1.stn.compctl mask.KR.ctl	<i>06.stn.BSISO1.COMP.gs*</i> (rgbset2.gs) (cbarn.gs)	P.KR.JJ.BSISO1.COMP.gif
6.2 Display BSISO2	52.BSISO2.stn.compctl mask.KR.ctl	<i>06.stn.BSISO2.COMP.gs*</i> (rgbset2.gs) (cbarn.gs)	P.KR.JJ.BSISO2.COMP.gif

Conversion [05. stn.GSform.BSISO1.f90]



```
1 PROGRAM read_parameter
2   INTEGER, PARAMETER :: istr=1981, iend=1981, mx=89, my=1, lt= iend-istr+1, mon=8
3   REAL, DIMENSION(mx) :: obs
4   REAL, DIMENSION(mx) :: RLAT, RLON, STNUM
5   REAL, DIMENSION(mx,mon) :: val
6   CHARACTER*8 STID
7
8
9
10  !....Input data - #13 : station data(lat, lon ), #14 : variable value
11  OPEN(13, file='C:\HandsOn\stn\DATA\51.station89.txt', STATUS='OLD')
12  !....Output data - #21 : to GrADS, #22 : to Surfer
13  OPEN(21, file='C:\HandsOn\stn\DATA\52.P.KR.MJJASO.19812010.BSISO1.COMP.gsform.dat', &
14  &      FORM='UNFORMATTED', ACCESS='STREAM', &
15  &      STATUS='UNKNOWN')
16
17
18  !....Read station data from UNIT #13
19  DO istn=1,mx
20    READ(13,*) ISTNUMBER, RLAT1, RLON1
21    STNUM(istn) = FLOAT(ISTNUMBER)
22    RLON(istn) = RLON1
23    RLAT(istn) = RLAT1
24  ENDDO
25  CLOSE(13)
26
27  !....Read variable value from UNIT #17
28  open (17, file='C:\HandsOn\stn\DATA\35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc', status='old')
```

Ex:VN)

P.KR → P.VN

89 → 55

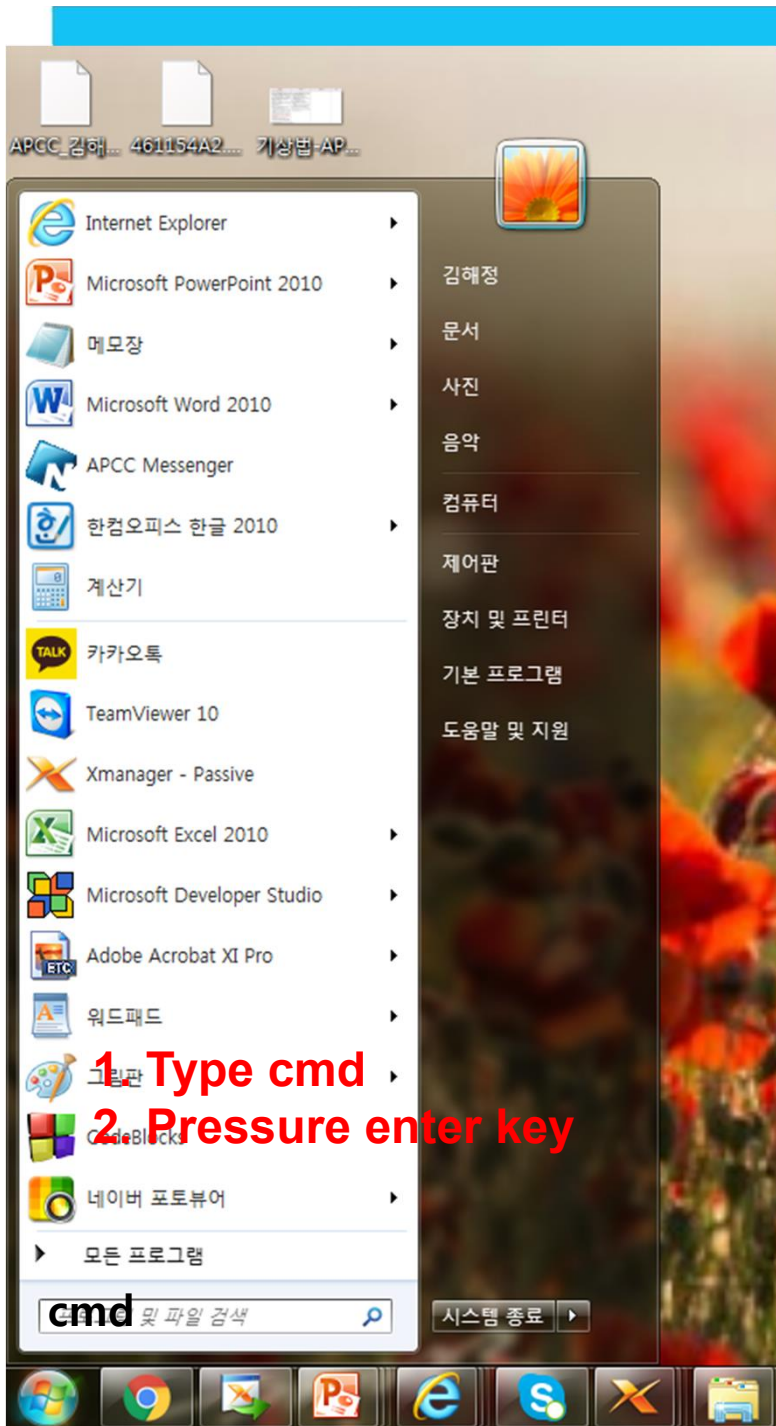


C:\HandsOn\stn\DATA\ 52.BSISO1.stn.comp.ctl

```
1 | DSET C:\HandsOn\stn\DATA\52.P.KR.MJJASO.19812010.BSISO1.COMP.gsform.dat
2 | DTYPE station
3 | STNMAP C:\HandsOn\stn\DATA\53.P.KR.MJJASO.19812010.BSISO1.COMP.gsform.map
4 | UNDEF -999.
5 | TITLE station data
6 | TDEF 8 LINEAR JAN1980 1dy
7 | VARS 1
8 | o 0 99 observed value
9 | ENDVARS
10
```

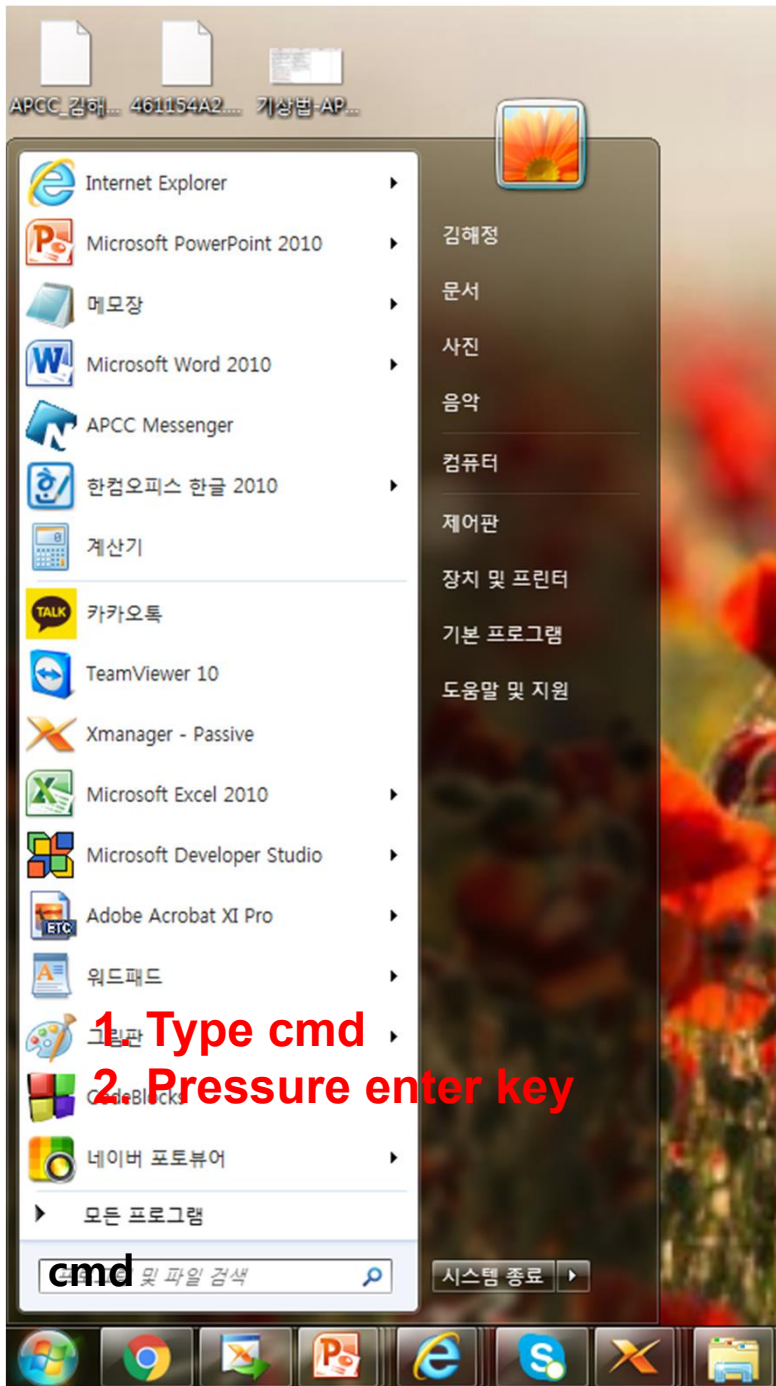
Ex:VN)

P.KR → P.VN



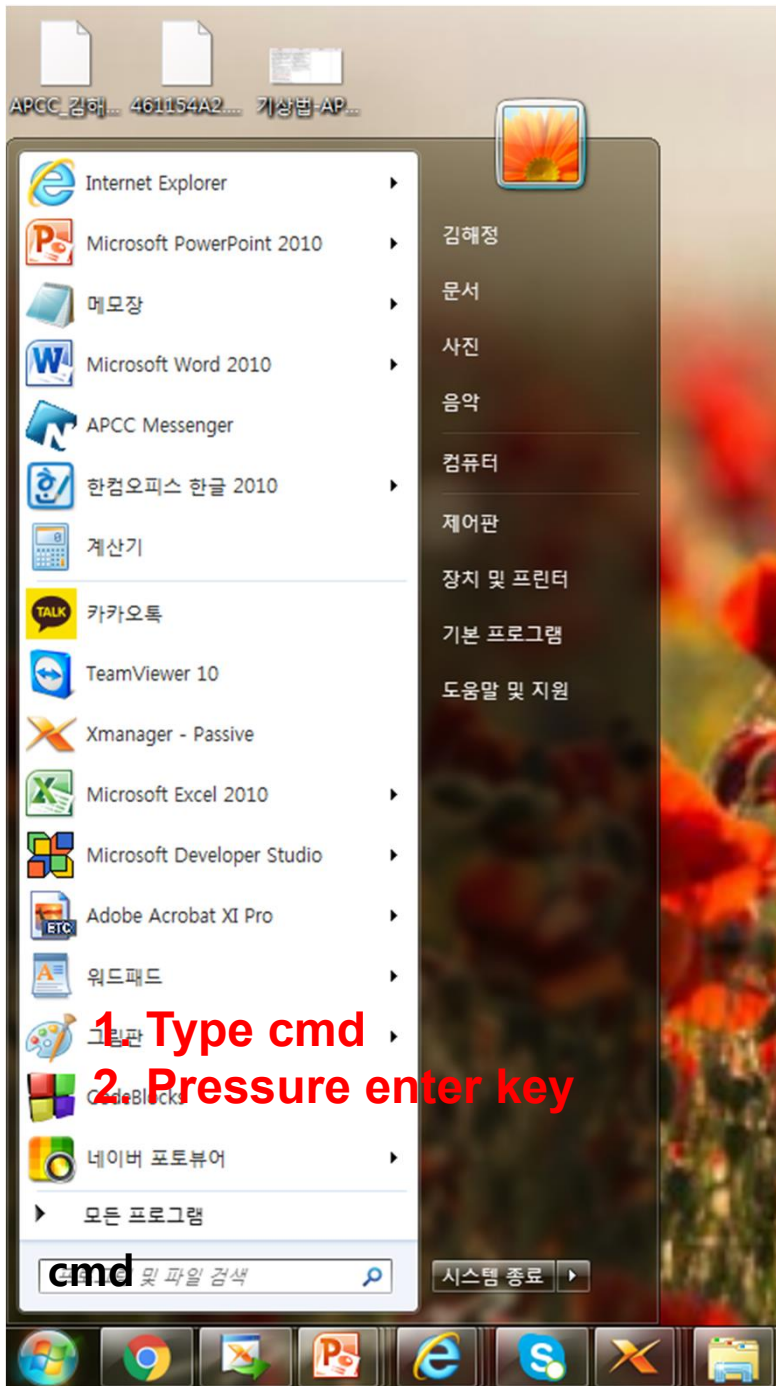
1. Type cmd
2. Pressure enter key





1. Type cmd
2. Pressure enter key





1. Type cmd
2. Pressure enter key



stnmap -i 52.BSISO2.stn.comp.ctl

	Input	Code	Output
5.1 Convert data format from ascii to bin	51.station89.txt 35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc	<i>05.stn.GSform.BSISO1.f90</i>	52.P.KR.MJJASO.19812010.BSISO1.COMP.gsform.dat
5.2 Convert data format from ascii to bin	51.station89.txt 36.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc	<i>05.stn.GSform.BSISO2.f90</i>	52.P.KR.MJJASO.19812010.BSISO2.COMP.gsform.dat
6.1 Display BSISO1	52.BSISO1.stn.comp.ctl mask.KR.ctl	<i>06.stn.BSISO1.COMP.gs*</i> (rgbset2.gs) (cbarn.gs)	P.KR.JJ.BSISO1.COMP.gif
6.2 Display BSISO2	52.BSISO2.stn.comp.ctl mask.KR.ctl	<i>06.stn.BSISO2.COMP.gs*</i> (rgbset2.gs) (cbarn.gs)	P.KR.JJ.BSISO2.COMP.gif

Draw [06.stn.BSISO1.COMP.gs]



```
1 'reinit'
2
3 'enable print C:\HandsOn\stn\DATA\P.KR.MJJASO.BSISO1.COMP.gmf'
4 'open C:\HandsOn\stn\DATA\52.BSISO1.stn.comp.ct1'
5 'open C:\HandsOn\stn\DATA\mask.KR.ct1'
6
7 'set display color white' → mask.MA.ct1
8 'clear'
9 'C:\HandsOn\stn\PROGRAM\rgbset2.gs'
10 'set vpage off'
11 'set vpage 0 8.5 0 11'
12 'set string 17 1 3'
13 'set strsiz 0.15'
14 'draw string 0.5 10.8 BSISO1'
15 'set string 17 1 3'
16 'draw string 0.5 10.6 Precipitation Composite Anomaly'
17
18 'set lon 124.9 131.1'      87.0  115.0
19 'set lat 32.9 39.1'       0.0   28.0
20 'set xlopts 1 4 0.12'
21 '*set ylopts 1 4 0.12'
22 'set ylopts 0 0 0'
23 'set xlint 2'
24 'set ylint 1'
```

Ex:VN)

P.KR → P.VN

File name

Domain

Draw [06.stn.BSISO1.COMP.gs]

