Mid-Term Exam

Write a Fortran program to calculate the mean and the standard deviation of precipitation for at least three different places on Earth.

1. read from at least three files (of your choice) the three (or more) sets of data. The files contain yearly precipitations for ten different stations on Earth from 1901 to 2000. On the first row you have the location (character of len 3).
2. compute the mean and standard deviation for three time slices (1901-1930, 1936-1965, 1971-2000)
3. write the results in a file as a table where you have 3 (or more) columns one for each of the locations and 6 rows one for each mean and standard deviation of the three time slices (see example in the figure next page)
4. calculate the difference in mean precipitation between the time slice 1936-1965 and 1901-1930 and between 1971-2000 and 1901-1930 for each location and write on the screen where the maximum of the change is observed.

Point 4 and red text are optional (extra points!)

Send the source code to fdi_sant@ictp.it

(Send to me only the file that contains the source code and rename it as MidTerm.YourLName.f90 and use the following email subject “MidTerm.YourLName” where YourLName is your last name)

Formula to find the sample mean for X

$$\mu_x = \frac{\sum X}{n}$$

Formula to find sample standard deviation for X

$$\sigma_x = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \mu_x)^2}{n-1}}$$

Results.txt

REGIONS:	AMZ	ARG	AUS	CAF	CEU	CHI	EUS	IND	SAF	WUS
SIGMA:	11.89	80.03	12.56	13.09	29.42	3.04	17.42	5.19	34.16	68.33
MEAN:	2111.88	1423.33	334.95	1235.82	1053.27	1396.15	1179.67	1154.93	466.74	340.24
SIGMA:	72.45	4.19	24.74	35.43	21.42	43.85	24.79	62.80	15.14	9.75
MEAN:	2399.01	1429.55	334.21	1077.30	1084.42	1261.34	1145.70	1149.38	640.62	378.49
SIGMA:	66.75	8.34	36.51	3.25	19.08	49.13	16.94	4.87	26.00	28.25
MEAN:	2571.68	1490.40	433.78	1100.52	1180.55	1338.64	1260.49	1007.05	791.02	360.63

HINTS

1) Make use of arrays to store the data will simplify the work

2) For the optional question and advance programmers.
How to write the file names in a character variable

```
character(len=6) :: namefile
 ... ... ... ... ... ... ...
 ... ... ... ... ... ... ...
write(namefile,'(i0.2,a)') i,".dat"
```