Fortran Language Comprehension test
Numerical Method I course for DP students

September 29, 2023

1. Write a FORTRAN program to read the elements of an array of real values stored in the file *sample.dat* and sort its component in ascending order by using the following code :

```
SUBROUTINE sort(a,n)
  IMPLICIT NONE
  REAL, INTENT(inout), DIMENSION(n) :: a
  INTEGER,  INTENT(IN) :: n
  REAL :: temp
  INTEGER :: i, j
  LOGICAL :: swapped

  DO j = n-1, 1, -1
    swapped = .FALSE.
    DO i = 1, j
      IF (a(i) > a(i+1)) THEN
        temp = a(i)
        a(i) = a(i+1)
        a(i+1) = temp
        swapped = .TRUE.
      END IF
    END DO
    IF (.NOT. swapped) EXIT
  END DO
END SUBROUTINE sort
```

2. Compute the 95^{th} percentile of the distribution of the sampled values by knowing that the m^{th} percentile of a distribution is the $\frac{(m \times N)}{100}$ component of the sorted array of the values.

- E-mail program source codes to: ggiulian@ictp.it
- *sample.dat* file in my public:
  /afs/ictp/public/g/ggiulian/WORLD/num1/sample.dat