FORTRAN - LAB EXERCISE - Prof. Richard B. Goldstein

Create the following program by Notepad: stat.for

Type the following program (make sure the "R" of Real in column 7.

```
C
C     Calculate sum, mean, and variance of n numbers
C
      REAL MEAN
      DIMENSION X(10)
      PRINT *, 'Choose a value of N between 2 and 10'
10    PRINT *, 'N='
      READ *,N
      IF (N.GT.10) THEN
        PRINT *, 'N is too large...try again'
        GO TO 10
      ELSE IF (N.LT.2) THEN
        PRINT *, 'N is too small...try again'
        GOTO 10
      ENDIF
      XSUM=0
      DO 20 I=1,N
        WRITE(6,100)I
        READ *, X(I)
        XSUM=XSUM+X(I)
20    CONTINUE
      MEAN=XSUM/N
      WRITE(6,200)MEAN
100   FORMAT(1X,'Input value #',I3)
200   FORMAT(1X,'Mean = ',F12.3)
      END
```

Choose one of the three versions of Fortran to compile, link, and execute. Start with a value of N that is too small or too large. Then try N as 4 and give values 3, 8, 6, and 1. The mean will be 4.5.

If there are any error messages, make a note of the type and line number and make corrections using Notepad.

If you have been successful, try adding a few new lines for a subroutine by returning to the editor, save again, compile & link again, and finally rerun. The added lines are shown in **BOLD** and <u>UNDERLINED</u>.

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      REAL MEAN
      DIMENSION X(10)
      PRINT *, 'Choose a value of N between 2 and 10'
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      READ *,N
      IF (N.GT.10) THEN
        PRINT *, 'N is too large...try again'
        GO TO 10
      ELSE IF (N.LT.2) THEN
        PRINT *, 'N is too small...try again'
        GOTO 10
      ENDIF
      XSUM=0
      DO 20 I=1,N
        WRITE(6,100)I
        READ *, X(I)
        XSUM=XSUM+X(I)
20    CONTINUE
      MEAN=XSUM/N
      WRITE(6,200)MEAN
      CALL MORE(N,X,MEAN,VAR)
      WRITE(6,300)VAR,SQRT(VAR)
100   FORMAT(1X,'Input value #',I3)
200   FORMAT(1X,'Mean = ',F12.3)
300   FORMAT(1X,'Variance = ',F12.5/1X,'St. Dev. = ',F12.5)
      END
      SUBROUTINE MORE(N,X,XBAR,V)
      DIMENSION X(10)
      XXSUM=0
      DO 10 I=1,N
      XXSUM=XXSUM+(X(I)-XBAR)**2
10    CONTINUE
      V=XXSUM/(N-1)
      RETURN
      END
```