!\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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!Creation Date:25/01/2013

!Assignment Number:3\_1

!Purpose: To calculate solutions to a quadratic equations, print the results

! to the screen and to print other results to a file

! called assign\_3\_1.out.

! Also handles errors to a point with input validation

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PROGRAM assign\_3\_1

IMPLICIT NONE

!a,b,c are variables and are initialised here

!dis will store the answer

REAL :: a,b,c,dis,x\_plus,x\_neg

!Initial conditions

a = 0

b = 0

c = 0

x\_plus = 0

x\_neg = 0

!Opens assign\_3\_1.out in unit number 99

OPEN(99,FILE='assign\_3\_1.out')

!Gets user input in a reasonably friendly manner

WRITE(\*,\*) 'a = what??'

READ(\*,\*) a

WRITE(\*,\*) 'b = what??'

READ(\*,\*) b

WRITE(\*,\*) 'c = what??'

READ(\*,\*) c

dis = (b\*\*2 - 4\*a\*c) !Calculate the discriminant

!Input validation and checking the number of solutions

IF (dis .gt. 0.0) THEN

WRITE(\*,\*) 'There are 2 solutions to the quadratic equation'

!Calculates the positive and negative x solution to the quadratic equation

x\_plus = ((-b + SQRT(dis))/(2\*a))

x\_neg = ((-b - SQRT(dis))/(2\*a))

ELSEIF (dis .eq. 0.0) THEN

x\_plus = ((-b)/(2\*a))

ELSEIF (dis .lt. 0.0) THEN

WRITE (\*,\*) 'Based on the coefficients entered,'

WRITE (\*,\*) 'there are no solutions'

WRITE (99,\*) 'No real solutions'

ENDIF

!Prints various useful pieces of information

WRITE (99,\*) "\n Here are the coefficients of the quadratic equation"

WRITE (99,\*) "a = ",a

WRITE (99,\*) "b = ",b

WRITE (99,\*) "c = ",c

WRITE (99,\*) "\n Here is the positive x value : ",x\_plus

WRITE (99,\*) "Here is the negative x value : ",x\_neg

WRITE (99,\*) "\n If either of the above values are 0.0 or NaN"

WRITE (99,\*) "there is not a real root for that value \n"

!Forcefully closes the file followed by halting execution

CLOSE(99)

END PROGRAM

Assign\_3\_1.out

Here are the coefficients of the quadratic equation

a = 2.000000

b = -12.00000

c = 18.00000

Here is the positive x value : 3.000000

Here is the negative x value : 0.000000

If either of the above values are 0.0 or NaN

there is not a real root for that value

!\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

!Author: Navrit Bal

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!Creation Date:26/01/2013

!Assignment Number:3\_2

!Purpose: To calculate solutions to a quadratic equations, print the results

! to the screen and to print other results to a file called assign\_3\_2.out.

! Also handles errors to a point with input validation and uses a menu system to ! let the user choose how the file handling of the program

!\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

PROGRAM assign\_3\_2

IMPLICIT NONE

!a,b,c are variables and are initialised here

!dis will store the answer

REAL :: a,b,c,dis,x\_plus,x\_neg

INTEGER :: mode

!Initial conditions

a = 0

b = 0

c = 0

x\_plus = 0

x\_neg = 0

WRITE(\*,\*) "Choose a mode out of the following choices"

WRITE(\*,\*) "1 - Only output to the screen, not the file"

WRITE(\*,\*) "2 - Overwrite existing file, not display to the screen"

WRITE(\*,\*) "3 - Append existing file, not display to the screen"

READ(\*,\*) mode

!Gets user input in a reasonably friendly manner

WRITE(\*,\*) '\n a = what??'

READ(\*,\*) a

WRITE(\*,\*) 'b = what??'

READ(\*,\*) b

WRITE(\*,\*) 'c = what??'

READ(\*,\*) c

dis = (b\*\*2 - 4\*a\*c) !Calculate the discriminant

IF ((mode ==2) .OR. (mode == 3)) THEN

!Input validation and checking the number of solutions

IF (dis > 0.0) THEN

WRITE(\*,\*) 'There are 2 solutions to the quadratic equation'

!Calculates the positive and negative x solution to

!the quadratic equation

x\_plus = ((-b + SQRT(dis))/(2\*a))

x\_neg = ((-b - SQRT(dis))/(2\*a))

ELSEIF (dis == 0.0) THEN

x\_plus = ((-b)/(2\*a))

ELSEIF (dis < 0.0) THEN

WRITE (\*,\*) 'Based on the coefficients entered,'

WRITE (\*,\*) 'there are no solutions'

WRITE (99,\*) 'No real solutions'

ENDIF

ENDIF

SELECT CASE (mode)

CASE (1) !Print to screen mode

!Prints various useful pieces of information

WRITE (\*,\*) "\n\n Here are the coefficients of the quadratic equation"

WRITE (\*,\*) "a = ",a

WRITE (\*,\*) "b = ",b

WRITE (\*,\*) "c = ",c

WRITE (\*,\*) "\n Here is the positive x value : ",x\_plus

WRITE (\*,\*) "Here is the negative x value : ",x\_neg

WRITE (\*,\*) "\n If either of the above values are 0.0 or NaN"

WRITE (\*,\*) "there is not a real root for that value \n\n"

CASE (2) !Overwrite file mode

!Opens assign\_3\_2.out in unit number 99 in overwrite mode

OPEN(99,FILE='assign\_3\_2.out')

!Prints various useful pieces of information

WRITE (99,\*) "\n\n Here are the coefficients of the quadratic equation"

WRITE (99,\*) "a = ",a

WRITE (99,\*) "b = ",b

WRITE (99,\*) "c = ",c

WRITE (99,\*) "\n Here is the positive x value : ",x\_plus

WRITE (99,\*) "Here is the negative x value : ",x\_neg

WRITE (99,\*) "\n If either of the above values are 0.0 or NaN"

WRITE (99,\*) "there is not a real root for that value \n\n"

CLOSE(99) !Forcefully closes the file followed by halting execution

CASE (3) !Append file mode

!Opens assign\_3\_2.out in unit number 99 in append mode

OPEN(99,FILE='assign\_3\_2.out',POSITION='APPEND')

!Prints various useful pieces of information

WRITE (99,\*) "\n\n Here are the coefficients of the quadratic equation"

WRITE (99,\*) "a = ",a

WRITE (99,\*) "b = ",b

WRITE (99,\*) "c = ",c

WRITE (99,\*) "\n Here is the positive x value : ",x\_plus

WRITE (99,\*) "Here is the negative x value : ",x\_neg

WRITE (99,\*) "\n If either of the above values are 0.0 or NaN"

WRITE (99,\*) "there is not a real root for that value \n\n"

CLOSE(99) !Forcefully closes the file followed by halting execution

CASE DEFAULT !In case of invalid input

WRITE (\*,\*) "You have entered invalid input"

WRITE (\*,\*) "Next time enter '1', '2' or '3'"

READ (\*,\*)

STOP !Halts execution

END SELECT

END PROGRAM

Assign\_3\_2.out

Here are the coefficients of the quadratic equation

a = 2.000000

b = -12.00000

c = 18.00000

Here is the positive x value : 3.000000

Here is the negative x value : 0.000000

If either of the above values are 0.0 or NaN

there is not a real root for that value

Here are the coefficients of the quadratic equation

a = 8.000000

b = 3.000000

c = 4.000000

Here is the positive x value : 0.000000

Here is the negative x value : 0.000000

If either of the above values are 0.0 or NaN

there is not a real root for that value

Here are the coefficients of the quadratic equation

a = 6.000000

b = 3.000000

c = -8.000000

Here is the positive x value : 0.9314539

Here is the negative x value : -1.431454

If either of the above values are 0.0 or NaN

there is not a real root for that value

End of week assignment questions

1. A. == .EQ. equal to

B. /= .NE. not equal to

C. < .LT. less than

D. > .MT. more than

E. >= .ME. more than or equal to

F. <= .LE. less than or equal to

1. LOGICAL - .TRUE. or .FALSE.
2. A. .TRUE.

B. .TRUE.

C. .FALSE.

D. .FALSE.

1. A. .AND.

B. .OR.

C. .EQV.

D. .NEQV.

E. .NOT.

1. A. .TRUE.

B. .FALSE.

C. .TRUE.

D. .FALSE.

1. When the statement immediately after the ‘IF’ is false