FORTRAN - CONSTANTS

The constants refer to the fixed values that the program cannot alter during its execution. These fixed values are also called **literals**.

Constants can be of any of the basic data types like an integer constant, a floating constant, a character constant, a complex constant, or a string literal. There are only two logical constants : **.true.** and **.false.**

The constants are treated just like regular variables, except that their values cannot be modified after their definition.

Named Constants and Literals

There are two types of constants:

- Literal constants
- Named constants

A literal constant have a value, but no name.

For example, following are the literal constants:

Type	Example
Integer constants	0 1 -1 300 123456789
Real constants	0.0 1.0 -1.0 123.456 7.1E+10 -52.715E-30
Complex constants	$0.0, 0.0 - 123.456E + 30, 987.654E - 29$
Logical constants	.true. .false.
Character constants	"PQR" "a" "123'abc$%#@!" " a quote "" " 'PQR' 'a' '123"abc$%#@!' ' an apostrophe '' '

A named constant has a value as well as a name.

Named constants should be declared at the beginning of a program or procedure, just like a variable type declaration, indicating its name and type. Named constants are declared with the parameter attribute. For example,

```
real, parameter :: pi = 3.1415927
```

Example

The following program calculates the displacement due to vertical motion under gravity.

```
program gravitationalDisp

! this program calculates vertical motion under gravity
implicit none
```

```
   ! gravitational acceleration
   real, parameter :: g = 9.81

   ! variable declaration
   real :: s ! displacement
   real :: t ! time
   real :: u ! initial speed

   ! assigning values
   t = 5.0
   u = 50

   ! displacement
   s = u * t - g * (t**2) / 2

   ! output
   print *, "Time = ", t
   print *, 'Displacement = ',s

end program gravitationalDisp
```

When the above code is compiled and executed, it produces the following result:

```
Time = 5.00000000
Displacement = 127.374992
```