

C library function - frexp()

Description

The C library function **double frexp(double x, int *exponent)** return value is the mantissa, and the integer pointed to by **exponent** is the exponent. The resultant value is **$x = \text{mantissa} * 2^{\text{exponent}}$** .

Declaration

Following is the declaration for frexp() function.

```
double frexp(double x, int *exponent)
```

Parameters

- **x** – This is the floating point value to be computed.
- **exponent** – This is the pointer to an **int** object where the value of the exponent is to be stored.

Return Value

This function returns the normalized fraction. If the argument x is not zero, the normalized fraction is x times a power of two, and its absolute value is always in the range 1/2 (inclusive) to 1 (exclusive). If x is zero, then the normalized fraction is zero and zero is stored in exp.

Example

The following example shows the usage of frexp() function.

```
#include <stdio.h>
#include <math.h>

int main () {
    double x = 1024, fraction;
    int e;

    fraction = frexp(x, &e);
    printf("x = %.21f = %.21f * 2^%d\n", x, fraction, e);

    return(0);
}
```

[Live Demo](#)

Let us compile and run the above program to produce the following result –

```
x = 1024.00 = 0.50 * 2^11
```