

rand() and srand() in C/C++

rand ()

rand() function is used in C to generate random numbers. If we generate a sequence of random number with rand() function, it will create the same sequence again and again every time program runs. Say if we are generating 5 random numbers in C with the help of rand() in a loop, then every time we compile and run the program our output must be the same sequence of numbers.

Syntax:

int rand(void):

returns a pseudo-random number in the range of 0 to RAND_MAX.

RAND_MAX: is a constant whose default value may vary between implementations but it is granted to be at least 32767.

```
// C program to generate random numbers
#include <stdio.h>
#include <stdlib.h>

// Driver program
int main(void)
{
    // This program will create same sequence of
    // random numbers on every program run

    for(int i = 0; i<5; i++)
        printf(" %d ", rand());
    return 0;
}
```

NOTE: This program will create same sequence of random numbers on every program run.

Output 1:

453 1276 3425 89

Output 2:

453 1276 3425 89

Output n:

453 1276 3425 89

srand()

The `srand()` function sets the starting point for producing a series of pseudo-random integers. If `srand()` is not called, the `rand()` seed is set as if `srand(1)` were called at program start. Any other value for seed sets the generator to a different starting point.

Syntax:

```
void srand( unsigned seed );
```

Seeds the pseudo-random number generator used by `rand()` with the value `seed`.

Note: The pseudo-random number generator should only be seeded once, before any calls to `rand()`, and the start of the program. It should not be repeatedly seeded, or reseeded every time you wish to generate a new batch of pseudo-random numbers.

Standard practice is to use the result of a call to `srand(time(0))` as the seed. However, `time()` returns a `time_t` value which vary everytime and hence the pseudo-random number vary for every program call.

```
// C program to generate random numbers
#include <stdio.h>
#include <stdlib.h>
#include <time.h>

// Driver program
int main(void)
{
    // This program will create different sequence of
    // random numbers on every program run

    // Use current time as seed for random generator
    srand(time(0));

    for(int i = 0; i<5; i++)
        printf(" %d ", rand());

    return 0;
}
```

Output 1:

```
453 1432 325 89
```

Output 2:

```
8976 21234 45 8975
```

Output n:

```
563 9873 12321 24132
```