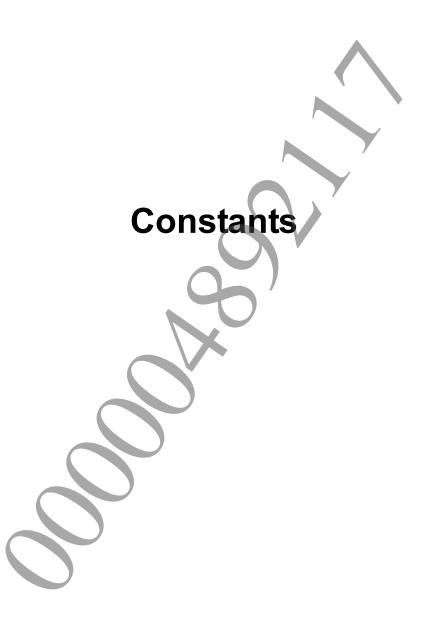


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# SCE SFMT19937 ARRAY SIZE

Array size for SFMT19937 pseudo random number calculation

#### **Definition**

#include <libsfmt19937.h> #define SCE SFMT19937 ARRAY SIZE /\* (19937 / 128) + 1 \*/ 156

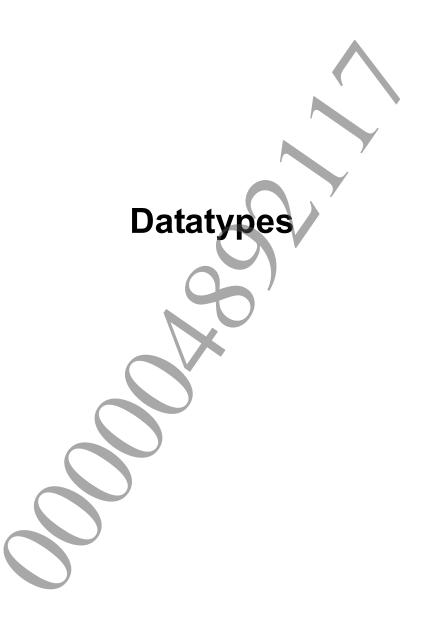
#### **Description**

This constant defines the array size for pseudo random numbers in conformance with SFMT19937. In addition to indicating the array size that is maintained as state in the SceSfmt19937Context structure, this constant is also used by the sceSfmt19937FillArray32() and sceSfmt19937FillArray64() functions to indicate the minimum size for generating random numbers.

#### See Also

SceSfmt19937Context, sceSfmt19937FillArray32(), sceSfmt19937FillArray64()





## SceSfmt19937Context

Context information for SFMT19937 pseudo random number calculation

#### **Definition**

```
#include <libsfmt19937.h>
typedef struct SceSfmt19937Context {
          unsigned int idx;
          unsigned int sfmt[SCE_SFMT19937_ARRAY_SIZE][4];
} SceSfmt19937Context;
```

#### **Description**

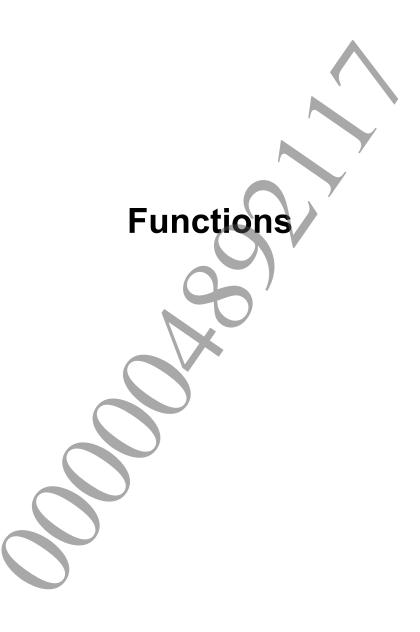
This structure is a work area for calculating pseudo random numbers in conformance with SFMT19937.

One instance of this work area must be prepared for each random number sequence.

#### See Also

SCE SFMT19937 ARRAY SIZE, sceSfmt19937InitGenRand(), sceSfmt19937InitByArray()





## sceSfmt19937InitGenRand

Initialize SFMT19937 pseudo random number work area

#### **Definition**

#### **Calling Conditions**

Multithread safe

#### **Arguments**

Pointer to an SceSfmt19937Context structure, which represents a random number sequence as a context.Specifies a random number sequence.

#### **Return Values**

If an error occurs, a negative value is returned.

Value	
SCE OK	Normal completion

#### **Description**

This function uses a 32-bit seed to initialize an SFMT19937 random number sequence, which is represented by the SceSfmt19937Context structure. This function must be executed before the sceSfmt19937GenRand32(), sceSfmt19937GenRand64(), sceSfmt19937FillArray32(), and sceSfmt19937FillArray64() functions.

Since only the SceSfmt19937Context structure indicated by pCtx is initialized, multiple random number sequences can be handled simultaneously by having multiple SceSfmt19937Context structures.

#### See Also

SceSfmt19937Context, sceSfmt19937InitByArray()

## sceSfmt19937InitByArray

Initialize SFMT19937 pseudo random number work area

#### **Definition**

#### **Calling Conditions**

Multithread safe

#### **Arguments**

Pointer to an SceSfmt19937Context structure, which represents a random number sequence as a context.

initkey Specifies the array to be used for initializing. 
keylength Number of elements in initkey.

#### **Return Values**

If an error occurs, a negative value is returned.

Value	
SCE_OK	Normal completion

#### **Description**

This function uses an array of 32-bit seeds to initialize an SFMT19937 random number sequence, which is represented by the SceSfmt19937Context structure. This function must be executed before the sceSfmt19937GenRand32(), sceSfmt19937GenRand64(), sceSfmt19937FillArray32(), and sceSfmt19937FillArray64() functions.

Since only the SceSfmt19937Context structure indicated by pCtx is initialized, multiple random number sequences can be handled simultaneously by having multiple SceSfmt19937Context structures.

#### See Also

SceSfmt19937Context, sceSfmt19937InitGenRand()

# Document serial number: 000004892117

## sceSfmt19937GenRand32

Generate an SFMT19937 32-bit pseudo random number

#### **Definition**

#### **Calling Conditions**

Multithread safe

#### **Arguments**

*PCtx* Pointer to an SceSfmt19937Context structure, which represents a random number sequence as a context.

#### **Return Values**

32-bit pseudo random number

#### **Description**

This function generates a 32-bit pseudo random number that conforms to SFMT19937.

Before using this function, the SceSfmt19937Context structure must be initialized by calling the sceSfmt19937InitGenRand() or sceSfmt19937InitByArray() functions.

#### See Also

SceSfmt19937Context, sceSfmt19937InitGenRand(), sceSfmt19937InitByArray()

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## sceSfmt19937GenRand64

Generate an SFMT19937 64-bit pseudo random number

#### **Definition**

#### **Calling Conditions**

Multithread safe

#### **Arguments**

*PCtx* Pointer to an SceSfmt19937Context structure, which represents a random number sequence as a context.

#### **Return Values**

64-bit pseudo random number

#### **Description**

This function generates a 64-bit pseudo random number that conforms to SFMT19937.

Before using this function, the SceSfmt19937Context structure must be initialized by calling the sceSfmt19937InitGenRand() or sceSfmt19937InitByArray() functions.

Note that if the sceSfmt19937GenRand32() and sceSfmt19937GenRand64() functions are used together and the sceSfmt19937GenRand64() function is called after the sceSfmt19937GenRand32() function has been called an odd number of times, a full 64-bit random number will not be obtained. Instead, this function will return a 64-bit value in which the upper 32 bits are zero.

#### See Also

SceSfmt19937Context, sceSfmt19937InitGenRand(), sceSfmt19937InitByArray()

# sceSfmt19937FillArray32

Generate an array of SFMT19937 32-bit pseudo random numbers

#### **Definition**

#### **Calling Conditions**

Multithread safe

#### **Arguments**

```
Pointer to an SceSfmt19937Context structure, which represents a random number sequence as a context.
Buffer for receiving the generated random numbers
Size
Number of elements in array (multiple of 4 that is larger than
SCE_SFMT19937_ARRAY_SIZE*4)
```

#### **Return Values**

If an error occurs, a negative value is returned.

Value	
SCE_OK	Normal completion

#### **Description**

This function generates an arbitrary number of 32-bit pseudo random numbers that conform to SFMT19937. *size* specifies the number of elements in *array* and must be a multiple of 4 that is larger than (SCE SFMT19937 ARRAY SIZE \* 4).

Before using this function, the SceSfmt19937Context structure must be initialized by calling the sceSfmt19937InitGenRand() or sceSfmt19937InitByArray() functions.

When the sceSfmt19937FillArray32() function is used together with the sceSfmt19937GenRand32() function, the sceSfmt19937FillArray32() function can be called only after the sceSfmt19937GenRand32() function has been called (SCE SFMT19937 ARRAY SIZE \* 4) times.

When the sceSfmt19937FillArray32() function is used together with the sceSfmt19937GenRand64() function, the sceSfmt19937FillArray32() function can be called only after the sceSfmt19937GenRand64() function has been called (SCE\_SFMT19937\_ARRAY\_SIZE \* 2) times.

#### See Also

SceSfmt19937Context, sceSfmt19937InitGenRand(), sceSfmt19937InitByArray()

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# sceSfmt19937FillArray64

Generate an array of SFMT19937 64-bit pseudo random numbers

#### **Definition**

#### **Calling Conditions**

Multithread safe

#### **Arguments**

```
Pointer to an SceSfmt19937Context structure, which represents a random number sequence as a context.

array Buffer for receiving the generated random numbers
Size Number of elements in array (multiple of 2 that is larger than SCE_SFMT19937_ARRAY_SIZE*2)
```

#### **Return Values**

If an error occurs, a negative value is returned.

Value	
SCE_OK	Normal completion

#### **Description**

This function generates an arbitrary number of 64-bit pseudo random numbers that conform to SFMT19937. <code>size</code> specifies the number of elements in <code>array</code> and must be a multiple of 2 that is larger than (SCE SFMT19937 ARRAY SIZE \* 2).

Before using this function, the SceSfmt19937Context structure must be initialized by calling the sceSfmt19937InitGenRand() or sceSfmt19937InitByArray() functions.

When the sceSfmt19937FillArray64() function is used together with the sceSfmt19937GenRand32() function, the sceSfmt19937FillArray64() function can be called only after the sceSfmt19937GenRand32() function has been called (SCE SFMT19937 ARRAY SIZE \* 4) times.

When the sceSfmt19937FillArray64() function is used together with the sceSfmt19937GenRand64() function, the sceSfmt19937FillArray64() function can be called only after the sceSfmt19937GenRand64() function has been called (SCE\_SFMT19937\_ARRAY\_SIZE \* 2) times.

#### See Also

SceSfmt19937Context, sceSfmt19937InitGenRand(), sceSfmt19937InitByArray()

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