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Chapter 1

Functions

1.1 bigrandom – random numbers

Historical Note The module was written for replacement of the Python standard module `random`, because in the era of Python 2.2 (prehistorical period of `NZMATH`) the `random` module raises `OverflowError` for long integer arguments for the `randrange` function, which is the only function having a use case in `NZMATH`.

After the creation of Python 2.3, it was theoretically possible to use `random.randrange`, since it started to accept long integer as its argument. Use of it was, however, not considered, since there had been the `bigrandom` module. It was lucky for us. In fall of 2006, we found a bug in `random.randrange` and reported it (see issue tracker); the `random.randrange` accepts long integers but returns unreliable result for truly big integers. The bug was fixed for Python 2.5.1. You can, therefore, use `random.randrange` instead of `bigrandom.randrange` for Python 2.5.1 or higher.

1.1.1 random – random number generator

`random()` → *float*

Return a random floating point number in the interval $[0, 1)$.

This function is an alias to `random.random` in the Python standard library.

1.1.2 randrange – random integer generator

`randrange(start: integer, stop: integer=None, step: integer=1)`
→ *integer*

Return a random integer in the range.

The argument names do not correspond to their roles, but users are familiar with the `range` built-in function of `Python` and understand the semantics. Calling with one argument n , then the result is an integer in the range $[0, n)$ chosen randomly. With two arguments n and m , in $[n, m)$, and with third l , in $[n, m) \cap (n + l\mathbb{Z})$.

This function is almost the same as `random.randrange` in the `Python` standard library. See the historical note [1.1](#).

Examples

```
>>> randrange(4, 10000, 3)
9919L
>>> randrange(4 * 10**60)
31925916908162253969182327491823596145612834799876775114620151L
```

1.1.3 `map_choice` – choice from image of mapping

`map_choice(mapping: function, upperbound: integer)`
`→ integer`

Return a choice from a set given as the image of the mapping from natural numbers (more precisely `range(upperbound)`). In other words, it is equivalent to: `random.choice([mapping(i) for i in range(upperbound)])`, if `upperbound` is small enough for the list size limit.

The `mapping` can be a partial function, i.e. it may return `None` for some input. However, if the resulting set is empty, it will end up with an infinite loop.