Implementation of Question 2:

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End criterion

1. the number of iterations reaches 5000

   OR:

2. falls into (11.08, 11.10)

Crossover operator

implementation of possibility to crossover:

Define `double pc = ...` as the possibility to crossover, then in each round one r.v.(*random value*) in （0.0， 1.0） will be generated. If r.v. < pc (the possibility is pc), the crossover will be carried out.

implementation of the crossover

Two r.v. (aka. the `start_index` and the `end_index`) in [0, 15] are generated in each round and a random pair of the generation will be choose (aka. `generation[i]` and `generation[2*i + 1]`, `i` is a r.v.), each digit between `start_index` and `end_index` will be `swap` between the pair.

Selection Method

Selection is made according to the classic *Roulette-Wheel Selection*: for the number i chromosome in an old generation, the possibility of being chosen into the next generation is