Exercise

The Berlekamp–Massey algorithm is an algorithm that will find the shortest linear feedback shift register (LFSR) for a given binary output sequence.

The algorithm will also find the minimal polynomial of a linearly recurrent sequence in an arbitrary field.

1. Please white a program based on Berlekamp–Massey algorithm to find the shortest linear feedback shift register (LFSR) for the given sequence down below.

- 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1, 1, 1, 1, 0, 0, 1, 0, 0, 0, 1, 0, 1, 1, 0, 0, 1, 1, 1, 0, 1, 0, 1, 0, 0, 1, 1, 1, 1, 1, 0, 1, 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0, 1, 1, 0, 1, 1, 0, 1, 0, 1, 1, 0, 1, 1, 1, 1, 0, 1, 1, 0, 0, 0, 1, 1, 0, 1, 0, 0, 1, 0, 1

You may refer http://bma.bozhu.me/

Exercise

2. Find the sequence generation rule of 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610…….

3. Extra credit

Use Berlekamp–Massey algorithm to find out the sequence rule of 0, 1, 1, 2, 3, 5, 8, 13, 21, 34
HINT 0,1,1,2,3,5,8,13,21,34...

s(x) = x^8+x^7+2x^6 +3x^5+5x^4+8x^3+13x^2+21x+34
r(x) = x^9

欲求次數小的c(x) 使得 f(x)r(x) + c(x)s(x) = b(x)，deg b < deg c

列表

算式	f(x)	c(x)	b(x)
(1)	1	0	x^9
(2)	0	1	x^8+x^7+2x^6 +3x^5+5x^4+8x^3+13x^2+21x+34