```
var c = "GAAGTGAGT,TTCGTAAGT,AAGGTACTT,CTGGTGAGC," +
        "AGAGTGAGT,CAGGTAGAG,ACTGTACGT,CTGGTGAGT," +
        "TATGTAAGT,CGGGTGAGC";
```

(a)

Matrix *sp*

	1	2	3	4	5	6	7	8	9
1	G	A	A	G	T	G	A	G	T
2	T	T	C	G	T	A	A	G	T
3	A	A	G	G	T	A	C	T	T
4	C	T	G	G	T	G	A	G	C
5	A	G	A	G	T	G	A	G	T
6	C	A	G	G	T	A	G	A	G
7	A	C	T	G	T	A	C	G	T
8	C	T	G	G	T	G	A	G	T
9	T	A	T	G	T	A	A	G	T
10	C	G	G	G	T	G	A	G	C

$rows(sp) = 10$

The motif model

```
var t = "AAAAAAACAG,AAAAACAGG,AAAACAGGT,AAACAGGTG," +
        "AACAGGTGA,ACAGGTGAG,CAGGTGAGT,AGGTGAGTA," +
        "GGTGAGTAA,GTGAGTAAA,TGAGTAAAA,GAGTAAAAA," +
        "AGTAAAAAA,GTAAAAAAA"
```

Matrix *sb*

	1	2	3	4	5	6	7	8	9
1	A	A	A	A	A	A	C	A	G
2	A	A	A	A	A	C	A	G	G
3	A	A	A	A	C	A	G	G	T
4	A	A	A	C	A	G	G	T	G
5	A	A	C	A	G	G	T	G	A
6	A	C	A	G	G	T	G	A	G
7	C	A	G	G	T	G	A	G	T
8	A	G	G	T	G	A	G	T	A
9	G	G	T	G	A	G	T	A	A
10	G	T	G	A	G	T	A	A	A
11	T	G	A	G	T	A	A	A	A
12	G	A	G	T	A	A	A	A	A
13	A	G	T	A	A	A	A	A	A
14	G	T	A	A	A	A	A	A	A
15	A	A	A	A	A	A	A	A	A
16	G	G	G	G	G	G	G	G	G
17	C	C	C	C	C	C	C	C	C
18	T	T	T	T	T	T	T	T	T

$rows(sb) = 18$

The background model

(b)

```
t += ',AAAAAAAAA,TTTTTTTTT,GGGGGGGGG,CCCCCCCCC';
```

Matrix *p* (PFM)

	1	2	3	4	5	6	7	8	9
G	1	2	5	10	1e-17	5	1	8	1
A	3	4	2	1e-17	1e-17	5	7	1	1e-17
T	2	3	2	1e-17	10	1e-17	1e-17	1	7
C	4	1	1	1e-17	1e-17	1e-17	2	1e-17	2

Matrix *b* (PFM)

	1	2	3	4	5	6	7	8	9
G	5	5	5	5	5	5	5	5	5
A	9	8	8	8	8	8	8	9	9
T	2	3	3	3	3	3	3	3	3
C	2	2	2	2	2	2	2	1	1

$$p[i,j] = \ln\left(\frac{(p[i,j]/rows[sp])}{(b[i,j]/rows[sb])}\right)$$

(c)

Matrix *p* (PWM)

	1	2	3	4	5	6	7	8	9
G	-1.02	-0.33	0.59	1.28	-40.17	0.59	-1.02	1.06	-1.02
A	-0.51	-0.11	-0.8	-40.64	-40.64	0.12	0.45	-1.61	-40.75
T	0.59	0.59	0.18	-39.65	1.79	-39.65	-39.65	-0.51	1.44
C	1.28	-0.11	-0.11	-39.25	-39.25	-39.25	0.59	-38.56	1.28

Dynamic PWMs with real additions to the background set

Dynamic PWMs with real additions to the background set. The example here refers to a z-sequence presented earlier, namely "AAAAAACAGGTGAGTAAAAAAAA". (**a**) Shows the motif set and the transformation of this set into a PFM stored in matrix p, (**b**) shows the background set and the transformation of this set into a PFM stored in matrix b. Notice the constant additions of the four sequences (t) to the background set. (**c**) It shows the construction of the PWM with the help of the two PFMs.

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