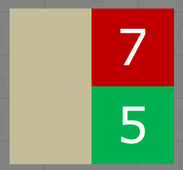
		T	G	G	A	T	C	G	A
	0	-2	-4	-6	-8	-10	-12	-14	-16
T	-2							-10	-12
G	-4							-6	-8
A	-6							-2	-4
A	-8							-1	0
T	-10							3	1
T	-12							4	2
C	-14	-10	-6	-5	-1	3	7	5	3
A	-16	-12	-8	-7	-3	1	5	6	7
G	-18	-14	-10	-6	-5	-1	3	7	5
T	-20	-16	-12	-8	-7	-3	1	5	6
T	-22	-18	-14	-10	-9	-5	-1	3	4
A	-24	-20	-16	-12	-8	-7	-3	1	5

Which expression is true?

$5 = +3 + (-1)$

$5 = +1 + (-2)$

$5 = +7 + (-2)$



(d)

		T	G	G	A	T	C	G	A
	0	-2	-4	-6	-8	-10	-12	-14	-16
T	-2	2	0	-2	-4	-6	-8	-10	-12
G	-4							-6	-8
A	-6							-2	-4
A	-8							-1	0
T	-10							3	1
T	-12							4	2
C	-14							5	3
A	-16							6	7
G	-18	-14	-10	-6	-5	-1	3	7	5
T	-20	-16	-12	-8	-7	-3	1	5	6
T	-22	-18	-14	-10	-9	-5	-1	3	4
A	-24	-20	-16	-12	-8	-7	-3	1	5

Which expression is true?

$3 = +1 + (-1)$

$3 = -1 + (-2)$

$3 = +5 + (-2)$

(c)

		T	G	G	A	T	C	G	A
	0	-2	-4	-6	-8	-10	-12	-14	-16
T	-2	2	0	-2	-4	-6	-8	-10	-12
G	-4							-6	-8
A	-6							-2	-4
A	-8							-1	0
T	-10							3	1
T	-12							4	2
C	-14							5	3
A	-16							6	7
G	-18	-14	-10	-6	-5	-1	3	7	5
T	-20	-16	-12	-8	-7	-3	1	5	6
T	-22	-18	-14	-10	-9	-5	-1	3	4
A	-24	-20	-16	-12	-8	-7	-3	1	5

Which expression is true?

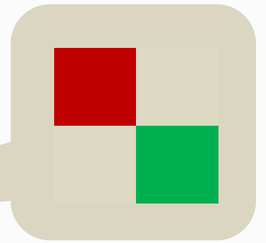
$5 = +3 + (+2)$

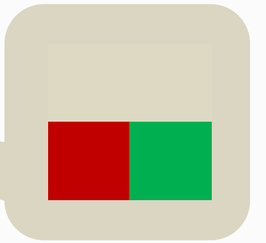
$5 = +1 + (-2)$

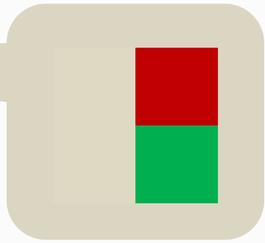
$5 = +4 + (-2)$

(b)

```
while (i>=2 || j>=2) {

    var Ai = m[i][0];
    var Bj = m[0][j];

    if(i>=2 && j>=2 && m[i][j] == m[i-1][j-1] + f(Ai, Bj)) {

        i = i - 1;
        j = j - 1;

    } else {

        if(i>=2 && m[i][j] == m[i-1][j] + gap) {

            i = i - 1;

        } else {

            j = j - 1;

        }
    }
}
```







(a)

Which expression is true?

$m[i][j] = m[i-1][j-1] + f(Ai, Bj)$

$m[i][j] = m[i][j-1] + gap$

(e)

$m[i][j] = m[i-1][j] + gap$

		T	G	G	A	T	C	G	A
	0	-2	-4	-6	-8	-10	-12	-14	-16
T	-2	2	0	-2	-4	-6	-8	-10	-12
G	-4	0	4	2	0	-2	-4	-6	-8
A	-6	-2	2	3	4	2	0	-2	-4
A	-8	-4	0	1	5	3	1	-1	0
T	-10	-6	-2	-1	3	7	5	3	1
T	-12	-8	-4	-3	1	5	6	4	2
C	-14	-10	-6	-5	-1	3	7	5	3
A	-16	-12	-8	-7	-3	1	5	6	7
G	-18	-14	-10	-6	-5	-1	3	7	5
T	-20	-16	-12	-8	-7	-3	1	5	6
T	-22	-18	-14	-10	-9	-5	-1	3	4
A	-24	-20	-16	-12	-8	-7	-3	1	5

(f)

```
TGAATTCAGTTA
||  |  ||  |   |
TGGA-TC-G--A
```

Traceback rules

Traceback rules. (**a**) shows the link between the implementation and the relative position of each element. (**b**, **c**, **d**) shows the first three iterations made by the traceback module in the global alignment case. (**e**) it shows the positions of the elements against which the equality is being verified. (**f**) show the complete traceback path and the two sequences aligned according to this path.

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