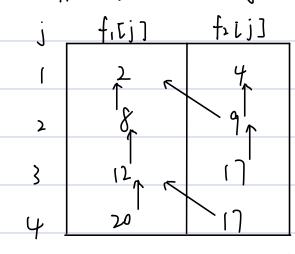
<b>B</b> ].
1. Procedure Fin)
if n==0 or n==   or n== } then
return
else
return Fin-1) + Fin-2) + Fin-3)
2.0(3 <sup>h</sup> )
Suffose 7 (n) is the required time of calculating fon).
Then Tin) = Tin-1) + Tin-2) + Tin-3) + O(1) and Tio)=T(1)= T(2)=T(3) = O(1)
The recursion tree expands by a 3 factor at each level, from level 0 having I node
to level 1c having 3k nodes. The height of the tree is Ocn, since slowest recursive call reduces n by
1. Thus the total number of nodes is:  +3'+3'+ +3"=0(3").
In conclusion, the time complexity is $O(3^n)$
3. function (- cn)
Initialize Alon]
A(0) + 1, A(1) + 1, A(1) + 1, A(1) + 1
for i=4 to n do
Acij = Aci-1] + Aci-2] + Aci-3]
return A(n)
4. Ocn)
In each iteration, there is only addition operation. So each step is Oci); The for loop
operates n-3 times, so the overall time complexity is ()(n)

1. Suppose aij donotes assembly time at Sij, tij denotes transfer time after Sij



$$f_{i}[j] = \begin{cases} a_{i1} & j = 1 \\ min(f_{i}(j-1) + a_{ij}, f_{2}[j-1] + t_{2(j-1)} + a_{ij}) & j > 1 \end{cases}$$

$$f_{1\bar{1}3}$$
] = min (8+4, 9+2+4) = 12  $f_{2\bar{1}3}$ ] = min (9+8,8+4+8)=1]

Comparison:

| Shift table:

A	G	С	T
2		4	2

A: 5 C: 5-1-0=4

G: 5-1-3= | T: 5-1-2=2

2.	AGCCGTGC		A	s c	c G	TGL		AGCC	GTGC
	CG TGL	>			TG		<b>→</b>		GTGC

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	'me	fata1	CO LA UN HON	ΛŤ	(AM	DAYION	ι'ς :	[+   +5=	- 1
		V	VIUMUSI	<u> </u>	V .	91113011	12.	1,1,,	_
				•					•

Q4.

Vertiœs	Øi	Ь	С	d	е
Cost	0	8	8	8	8
Pre	-	•	_	-	

The 1st iteration:

Vertices	٥ı	Ь	С	d	е
Cost	0	8	٦	8	4
 Pre		•	Cı		G

Vertices	٥ı	Ь	С	d	е
Cost	0	8	٦	8	-3
Pre	-	•	G	-	С

Vertices	a	Ь	С	d	е
Cost	0	-	٦	8	-3
Pre	1	е	G	-	С

Vertices	Oi	Ь	С	d	е
Lost	0	-1	٦,	4	-3
Pre	•	е	G	e	С

The 2nd iteration: no more updating

Check for negative vieight cycle:

So there is no pagative weight cycle.

So the shortest path from vertex a:	/b: a-c-e-b
So the shortest path from Vertex a:	C: 01-C
	d: a-c-e-d
	1 e · a - c - e

ı	

		A	Ą	7	G
	0	-5 <u>~</u>	lo <u>e</u>	— −15 <u>←</u>	20
A	-7	\ \ \frac{1}{2} \leftarrow \lefta	3 6	& &	13
G	- <u> </u> 2	-3	-3 K	8	-6
С	- 15	-8	-8	- 8	-11

2.

		A	A	7	G
	0	0 6	U	0	0
A	0	2	2	0 4	0
6	0	0	0	0	2
С	0	D	0	J	၁

optimal local alignment: A-A, G-G [ocal score=2