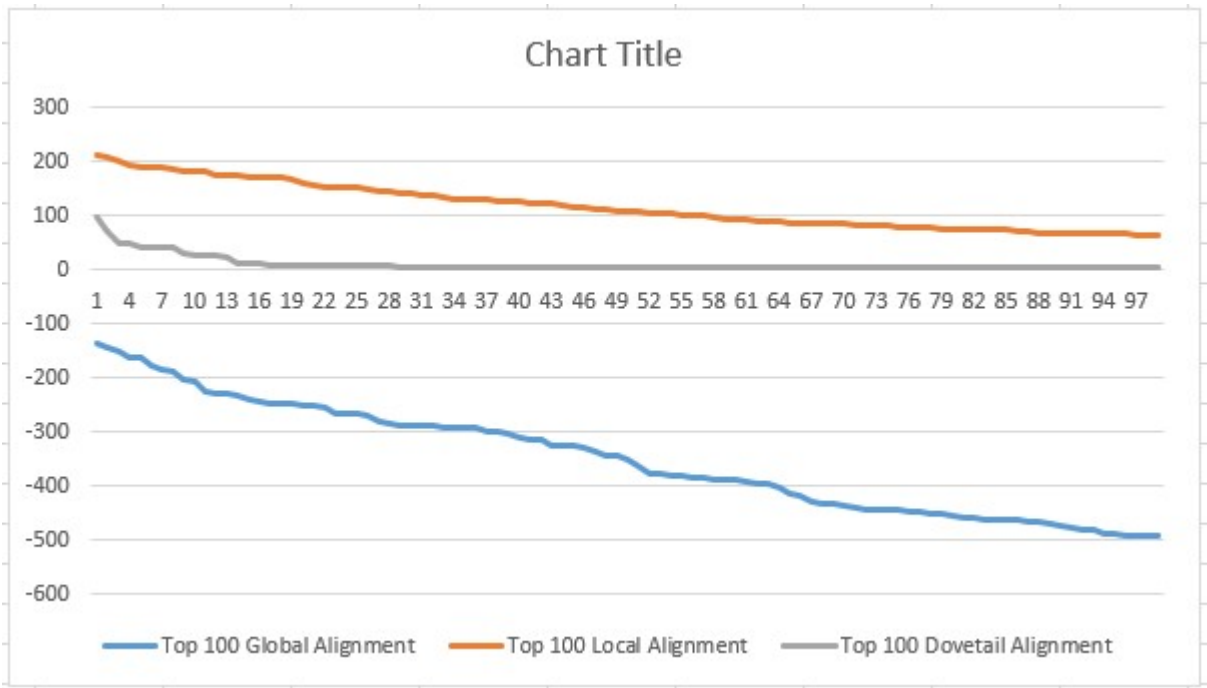
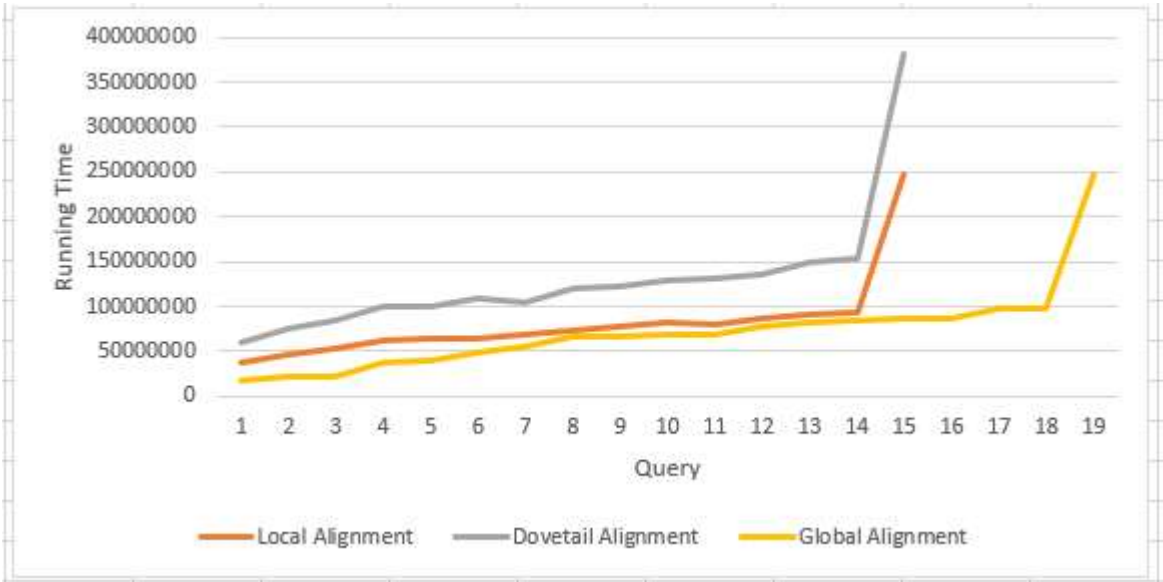


Graph 1:



Graph 2:



Graph 2 table:

Query ID	Query Length	Running time		
		Global Alignment	Local Alignment	Dovetail Alignment
100128573	525	18515102	18335686	27895539
729609	628	22059862	20435396	32752802
100289361	640	22612421	21989674	35925512
222029	1068	37243928	36348387	56760663
100287010	1084	39350382	36734602	60172594
100288846	1377	48078744	46220300	75987797
79857	1630	56435453	53430947	84480424
145474	1859	67036308	62875305	100735840
100289230	1876	67397495	64381176	101029171
653160	1917	68890416	64128675	108870026
146512	1980	68729201	67941050	105069985
100128288	2129	76685339	72473232	119705187
401105	2266	81235430	77332180	123184557
284578	2363	84877840	82147647	128916656
100190986	2453	86303605	80901985	131568607
100128361	2497	86492314	85738637	136370341
200058	2717	96723281	91599651	148070189
648987	2783	97940766	93452564	152543530
645644	7148	247429915	246938111	380637242

- 1) Graph 1 shows us that Global alignment has the lowest score whereas Local alignment has Highest score.
- 2) This is because in Local alignment we do not consider negative values.
- 3) In Dovetail Alignment, even though we consider negative values, we don't align the entire sequences hence the values are greater than Global Alignment.
- 4) Graph 2 shows us that Dovetail Alignment is the slowest whereas Local alignment is the fastest.
- 5) This is because complexity of Dovetail alignment is:
 - Dynamic Programming: $O(m*n)$
 - Finding Maximum value: $O(m+n)$
 - Trace Back: $O(m*n)$
- 6) Therefore overall time complexity of Dovetail Alignment is: $O(m*n) + O(m+n) + O(m*n)$
- 7) Complexity of Local Alignment is:
 - Dynamic Programming: $O(m*n)$
 - Trace Back: $O(m*n)$
- 8) Therefore overall time complexity of Dovetail Alignment is: $O(m*n) + O(m*n)$

- 9) Similarly, overall time complexity of Global Alignment is: $O(m*n) + O(m*n)$
- 10) But because in Global Alignment we trace back the entire matrix and only a part of it in local alignment, local alignment is faster than global alignment.