# CSCI 570 Project Report

Group Members:

| | USCID |
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Contributions of each member:

| | Contributions |
|---|---|
| Ramya Gopinath | Coding – Basic Version |
| Akash Ram Praveen Raj | Coding – Efficient Version |
| Nitish Sanjay Surana | Test Cases Creation, Visualization, Quality Control, Report Preparation, Bash Script |

Key Insights:

1. There are multiple alignments for the same set of inputs having the same alignment scores.
2. We can see that CPU time tends to increase exponentially as the problem size increases for both Basic and D&C version of sequence alignment.
3. The total memory usage over the wide range of problem size is stable for both the Basic version and the D&C version of sequence alignment.
4. The D&C algorithm generally takes twice the time, the Basic sequence alignment algorithms takes. This happens as D&C algorithm does twice the amount of work done compared to the Basic sequence alignment algorithm to save memory.
5. We also see that the D&C version of sequence alignment generally takes much lesser memory than the Basic version. As we do not use the entire DP matrix to find the optimal solution, we save a lot of memory while trying to backtrack after obtaining the optimal value of the solution.