**Report on Project work for Data Structures and algorithms**

Introduction:

This report explores key concepts in sorting algorithms, searching algorithms, trees, graphs, recursion, linked lists, queues and stacks.

New concepts encountered:

Exponential search was a new concept to us. It introduced the idea of range finding for unbounded data, unlike binary search that we were familiar with.

Applying memorization in recursion to Fibonacci to enable optimization using recursive solutions.

Priority queues using heaps and circular queues which helped us to see how data structures can be tailored for specific uses like scheduling.

Challenges faced:

Learning how to use memorization for Fibonacci to have a more efficient algorithm without causing a stack overflow.

Dividing tasks without overburdening others since each task required special attention.

Understanding the subset sum was initially a problem to understand and implementing it took a bit of time.

Key takeaways:

Efficiency of an algorithm matters in terms of the time complexity and space complexity.

Specific data structures are more efficient in specific problems.

Memoization in Fibonacci transforms inefficient solutions into practical ones.

Lessons learned:

Effective communication is key since it saves time and makes working together much easier.

Dividing the tasks makes us much more efficient as a group.

Conclusion:

This project work challenged our brains and helped us to realise that to solve a problem you have to take many factors into consideration and make sure that the algorithm you chose is efficient for the problem you have. We have learnt the value of cooperation and how efficient we can be when we work as a team. This has surely been a challenge and has not left us the same.

**GROUP 3:**

NAMUGENYI LISA LUSINGA B30300 S24B38/010

SSENYONJO ANDREW B30301 S24B38/011

JADA FRANCIS B30306 S24B38/014

KISAKYE MARIA SENGENDO B30260 S24B38/033