**A2 – Recursive Rover**

**Data Structures**

***Functional Specification***

|  |  |
| --- | --- |
| Josh Cooper / 1039652 |  |
| Stephen Johnson |  |
| Data Structures |  |
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# Requirements Summary

The project is required to implement a data structure for storing a 1024 x 1024 tile map which can be accessed efficiently. This structure is then used in a recursive search algorithm to find paths from one point on the map to another without inflicting a stack overflow.

# System Requirements Summary

Visual Studio 2013

C++11 compliant compiler

X86 processor

# Class Diagram Design



# Benchmarking Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Map 1 | | Map 2 | |
| Instructions Ordering | Total Moves | Path Length | Total Moves | Path Length |
| x1-y2-y1-x2 && y1-x2-x1-y2 | 13187 | 9576 | 12006 | 8394 |
| x1-x2-y2-y1 && y1-y2-x2-x1 | 15868 | 5702 | 13982 | 5980 |
| x1-x2-y1-y2 && y1-y2-x1-x2 | 15529 | 5588 | 13631 | 5908 |
| x1-y1-x2-y2 && y1-x1-y2-x2 | 14326 | 4454 | 10665 | 4466 |
| x1-y1-y2-x2 && y1-x1-x2-y2 | 8924 | 7426 | 7053 | 6090 |
| x1-y1-y2-x2 && y1-y2-x2-x1 | 14711 | 5244 | 11850 | 4820 |
| x1-y2-x2-y1 && y1-x2-y2-x1 | 14891 | 10376 |  |  |
| x1-y1-y2-x2 && y1-x2-y2-x1 | 12974 | 11036 | 6919 | 5690 |
| x1-y1-y2-x2 && y1-x2-x1-y1 | 8689 | 8512 | 9503 | 6528 |

# Assumptions and Dependencies

The files being loaded haven’t become corrupt.

# Feature Cuts and Unsupported Scenarios

Feature cuts:

None

# References

None