

## Experiment 1

### Foundations of AI

#### Path traversal using Depth First Search

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#R version 4.1.0

#RStudio version 1.4.1717

The objective of the experiment is to find the path, traversing all the nodes, from the starting node in the given graph or tree using Depth First Search

- First using `rm(list = ls())` clear the environment before executing the code
- Make a function `dfs` with arguments `graph` and `start`
- `graph` is an adjacency-matrix-representation of the graph where `(x,y)` is `TRUE` if there is an edge between nodes `x` and `y`
- `start` -> the node to start from.
- The function returns an array containing the path from the given start node till it traverses every node in the graph
- We Use a stack to manage the nodes that have yet to be visited and initialized with the start node
- The last element of the stack is removed and set as the current node
- The current node is set as visited and added to the path
- Now we check all the neighbouring elements of the current node and add them to the stack
- We initialize the graph and starting node outside the function and call the function `dfs`