Phase 2

Task 7:

Translating MATLAB Code to JavaScript

Q) **Transform the MATLAB FEA code into JavaScript using appropriate data structures and numerical libraries (e.g., math.js, numeric.js).**

JavaScript Code:

```
//Firstly, I will  Import the mathjs library as it helps to perform mathematical operations in Javascript
const math = require('mathjs');

// Define the system matrices(Stiffness matrix for FEA) and vectors(Represents external forces)
const K = math.matrix([[4, -1], [-1, 3]]);
const f = math.matrix([[6], [5]]);



// Solve the FEA system using LU(Lower-Upper) decomposition(solves majorly Linear systems)
const solution = math.lusolve(K, f);

console.log("Solution u:");
console.log(math.transpose(solution));
```

Output Window:

```
Solution u:
DenseMatrix {
  _data: [ [ 2.090909090909091, 2.3636363636363638 ] ],
  _size: [ 1, 2 ],
  _datatype: undefined
}
Press any key to continue...
```