Mid-Term Presentation

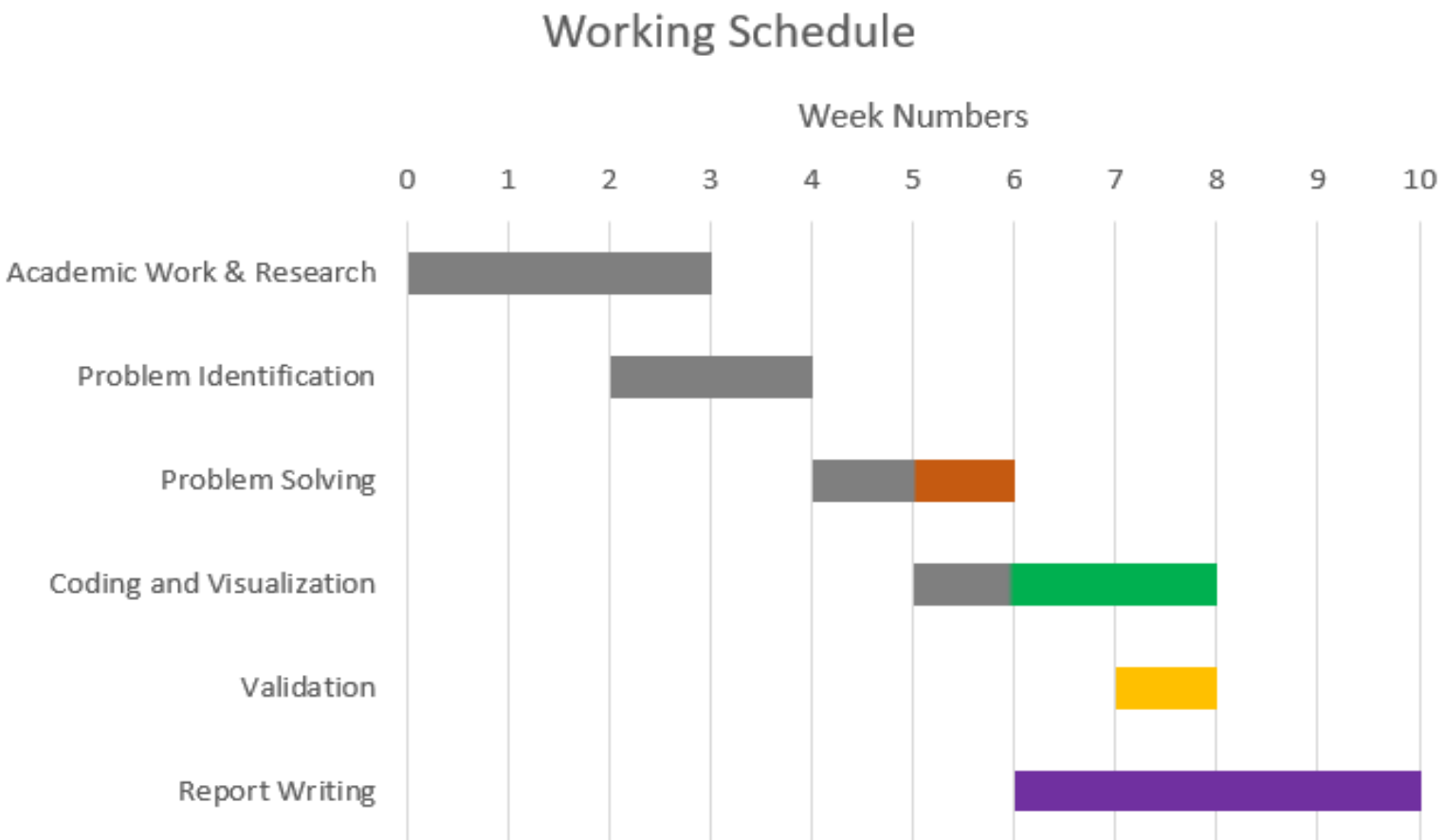
FEM and its application to static structures

Group A

Introduction

- Finite Element Method (FEM) is a procedure of numerical solution of a domain viewed as the collection of sub-domains.
- FEM on static structures computing the stress and displacement.
- The actual problem will be replaced by simpler ones to find one approximate solution.

Gantt Chart : Progress



Progress so far.

- **Problem Identification**
  each member came up with various problems where FEM is used and we decided on trusses.
- **Theoretical Background**
  Went through basic ideas about FEM and the new concepts.

Progress so far.

- **Manual and Python Implementation**
  wrote custom classes and procedures for solving the problem in python. Tested code against examples in book and worked on debugging.
- **Visualization**
  Worked on visualizing the structure and the deformations in python using the problem data and solution data.

Class Implementation

custom classs in jupyter notebook for nodes and matrices.

Mechanical Approach

followed joint and sectional method and verified .

Visualization

code for visualizing any problem given the coordinates.

Future Plans

Working of solution:

- Solution part is working for some problem but not for all.
- Why, how and in which cases the solution can work in all problem is to be worked on.

Software Visualization:

- Data has been generated, solved upon and visualized to an extent both theoretically and manually.
- The streamlining of all these components and compiling it is needed.

Things left

Theoretical readings:

- As of now, we have only worked and implemented on software.
- Knowledge of mandatory principles and applications of FEM is to be thoroughly studied.

Report Writing:

- Final report of the project is to be written.

Thank You