



POM212

SKILLS FOR CIVIL & GEOMATICS ENGINEERS

Group Project in computer programming

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Introduction to the Group Project

- The aim of this project is to help students develop the skills outlined below
 - Programming
 - Self Learning
 - Assist in the development of others
 - Working in Groups and leadership
 - Communication
 - Presentations
 - Quality control

Introduction to the Group project

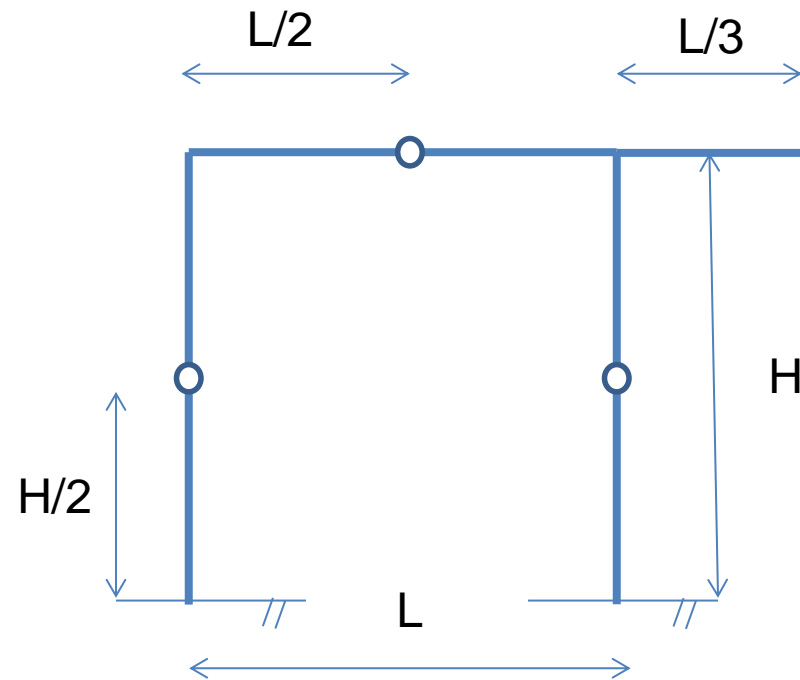
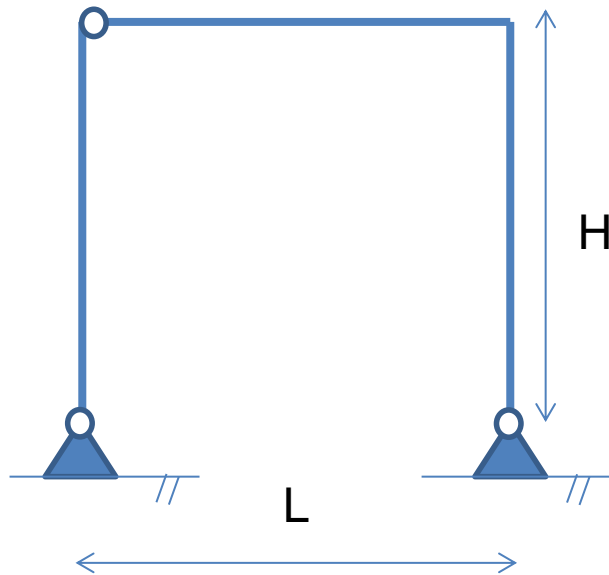
- Your aim is to develop a software in either MATLAB or spreadsheet environment that should:
 - Should satisfy and deliver the asked outcomes (Deliverables)
 - Give correct results
 - Be foolproof (remove all bugs or ways that the user could corrupt the outcomes)
 - Be user friendly
 - deliver graphic and numerical results
 - be transparent
 - be well presented
 - Completeness, Accuracy, Clarity

e-Tool For Frame Analysis

- Work Package 1: Section Table with Section Properties
 - Your software should calculate clearly the properties for the sections given below, given typical dimensions.
 - CHS, RHS, T-beam, I beam
 - Section properties
 - Perimeter
 - Area
 - Second Moment of Area , I_{xx} and I_{yy}
 - Section classification according to EC 3 (EN1993)
 - Mass per m
- The results from this sheet should fit in the next steps

e-Tool For Frame Analysis

- The main aim of the software is the analysis and design of the members of specific portal frames.



e-Tool For Frame Analysis

- Two different Portal Frames.
 - Work Package 2:
 - Portal frames
 - Loading. Point loads can be applied at member ends and its middle. Point loads can be axial or transverse. The software should allow up to two different forces at each load point.
 - Geometry
 - Any span
 - Any height
 - Availability to use different sections for columns and for beams.

e-Tool For Frame Analysis

- Work Package 2: Analysis
 - Analysis
 - Reactions at supports
 - Axial forces in the members
 - Max shear force in a member and its position
 - Max bending moment in a member and its position
 - Warning if a member has yielded in a location
 - Buckling checks where relevant.
 - Member edge displacements in the place
 - Warning if a member displacement is greater than allowable (from EC3 design guide)
- Work Package 3: Cost
 - Cost
 - Mass (EUR/kg)

e-Tool For Frame Analysis

- Work Package 4: Results presentation
 - A diagram of the portal frames with indicative load case
 - BMD, SFD and AFD Diagrams
 - A diagram showing the displacement of the portal frame with numerical results
 - Horizontal displacement of the left beam-column connection
 - Vertical displacement of beam midspan

Group project

- Deliverables

- Your softwares (MATLAB/EXCEL) should be sent with a coversheet on a specific date at a specified email address.
- You will also submit a small manual with instructions of how to use your software and what it can be used for.
- You should also submit a video-tutorial with over and screenshots, again to help the user understand your software and what it does. Max time is 5 minutes. This should be submitted via CD or usb stick. For help in creating video tutorials see <http://mashable.com/2008/02/21/screencasting-video-tutorials/>
- An A2 poster should also be prepared. The poster should highlight the capabilities of the software and be used as a marketing tool. You will use that to present your software for 10 minutes before we view your video tutorials
- Finally a list with every group member's involvement should also be submitted.

Group project

- For the next 3 weeks
 - Each group has 30 mins of consulting time with Project tutor for the next three weeks till submission.
 - The brief is by no means complete. Each group is responsible to ask for any information needed.
 - Even though everyone will have a different role in each group, it is essential that all members of the group know how the software functions and what it does.

Tips

- Books for inexperienced users / Manuals
 - Check www.bookboon.com for free books on MS Excel
- Online video tutorials
- Google it! (especially error messages)
 - Software Support / User Forums