

# PythonOCC and PyPlot

## Objective

Osdag is a free and open-source software used for the design and detailing of steel structures such as buildings and bridges. We aim to create CAD drawings and diagram plots for visual representation of members and data in Osdag.

For the screening assignment, you have to work on these two tasks:

1. Create a shear force (SFD) and bending moment diagram (BMD) from the values provided in the Excel sheet using PyPlot.
2. Develop a CAD drawing with PythonOCC of a Laced Compound Column as shown in the representative image.

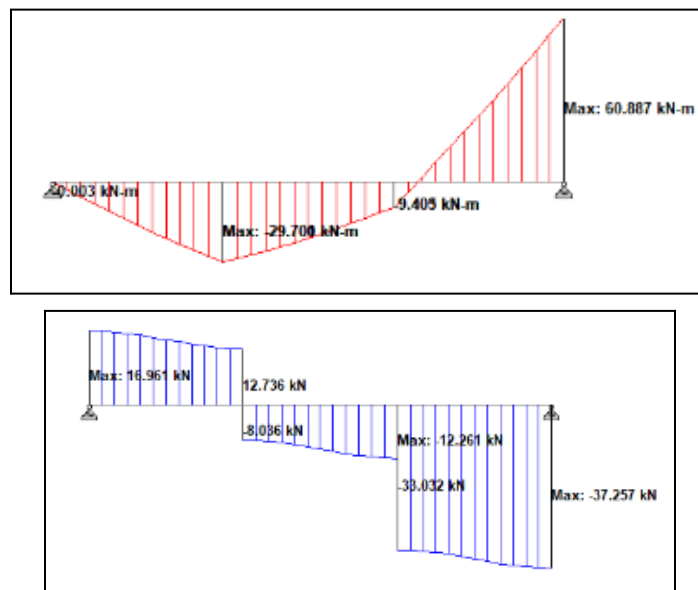
The specific requirements for the task have been mentioned below.

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## Task-1:

### SFD and BMD from Excel Sheet

Create a shear force (SFD) and bending moment diagram (BMD) from the values provided in the Excel sheet using PyPlot. You can refer to the values plotted from [\[this Excel Sheet\]](#).



*Bending Moment Diagram (Left) & Shear Force Diagram (Right)*

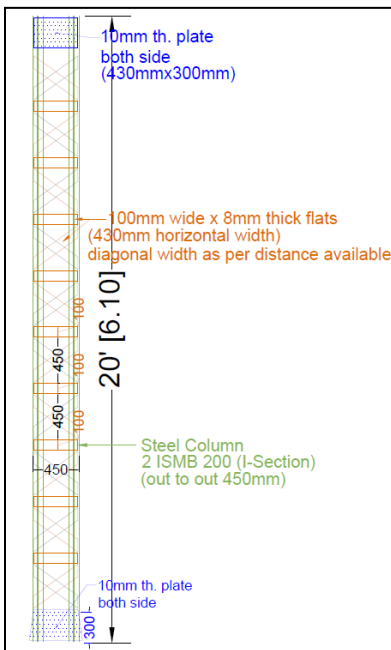
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## Task-2:

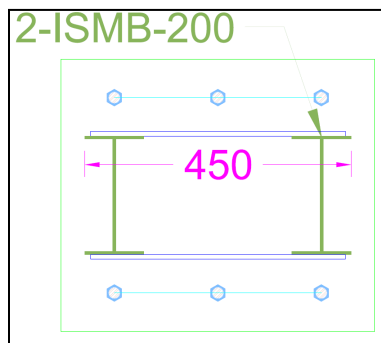
### Develop a CAD drawing with PythonOCC of a Laced Compound Column as shown in the representative image.

Using PythonOCC, replicate the following drawing. Refer to the I-section and portal frame PythonOCC files [\[here\]](#).

Description: A laced column is a built-up column made up of **two I-Sections**. These are generally kept some **distance apart (450mm)** in the drawing) to account for the load carried by this compound column. The top and bottom plates, known as **end battens**, are of 300mm Depth and of 10mm Thickness on both sides. These different I-Sections are further connected by laces which are 100mm wide and 8mm thick plates at a distance where the diagonal lace is almost at 45 degrees. These distances have also been shown in the drawing.



*Laced Column (Reference Drawing Front View)*



*Laced Column (Reference Drawing Top View)*

*Single-Laced Column (Representative Photo)*

## Submission Requirements:

### 1. Video Demonstration



- Create a short video showcasing the functionality of your code. A simple screengrab is sufficient; no need for curation. The video can be silent. Upload it as an unlisted video on YouTube. Provide the link.

### 2. Github Repository Link

- Provide the GitHub repository link and add [osdaq-admin](#) as a collaborator.

### 3. Report Documentation

- Submit a PDF document explaining the code you have created.
- Submit a ZIP file containing all relevant files and codes for the project.

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## Additional Notes

- This task is designed to evaluate your technical and creative abilities in animation and structural design. Please feel free to ask for any clarifications or assistance during the task.
- All the screening task submissions are licensed under a Creative Commons Attribution-ShareAlike 4.0 International License by FOSSEE.

- If you are directly looking for a job (on contract), please submit the task as above and write an email to us.

Good luck!