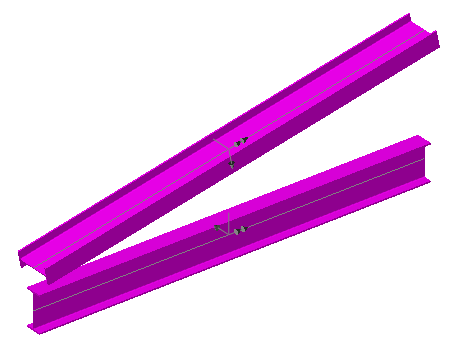
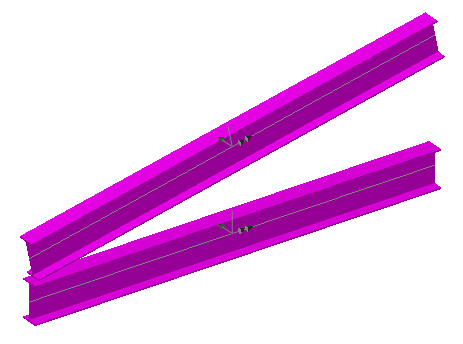
Script to align beam axes such that y is horizontal

In LUSAS it is essential for beams to be correctly aligned so that the input section properties match the intended orientation of the beam. The orientation can be checked by viewing the element axes (Mesh layer – tick ‘show element axes’) or by turning on section fleshing. The default line axes and line mesh axes may not be necessarily correct and these should always be checked. For example, a small deviation from horizontal will cause the axes to flip by 90°.



This can be corrected by assigning each line mesh with a Beta angle or local coordinate, but this becomes time-consuming and error-prone for significant models.

The attached script automates the assignment of line meshes, using local coordinate attributes to keep the axes consistent. In this script the chosen orientation is for the local y-axis to always be horizontal. The local x is in the direction of the line and the local z-axis is found such that it forms an orthogonal system with x and y.



The script is set up to assign a thick nonlinear beam (BTS3) mesh with one division to all currently selected lines. Please note that in most cases this will result in a mesh that is far too coarse for accurate results. **The generated mesh should be edited by the user to ensure a suitable mesh type (i.e. BMS3 or BTS3) and spacing (i.e. 0.1m, 1m, etc…) for the specific model.**

The script assumes that the global Z-axis is vertical.

To use the script, please follow the instructions below.

1. Save the script **OrientateBeam\_y\_horizontal.vbs** locally.
2. In the model, select all lines to be meshed.
3. Run the script by clicking the ‘Run Script’ icon () and opening **OrientateBeam\_y\_horizontal.vbs.**
4. Visually check the mesh orientations using ‘show element orientations’ or section fleshing.
5. Edit the generated mesh ‘BTS3 1div’ to ensure a suitable mesh type and spacing for your model are used.

If multiple different line mesh types are required, the lines for each type should be meshed at a time, then the name of the generated mesh attribute should be changed to avoid them being overwritten when the script is run for the next batch.

N.B. THIS SCRIPT IS NOT PART OF LUSAS SOFTWARE AND AS SUCH IS NOT QUALITY APPROVED OR SUPPORTED. IT IS PROVIDED ON AN AS IS BASIS FOR DEMONSTRATION PURPOSES ONLY.