Exercise Sheet 2

Part 1

Firstly, it generates 3d points and projects these points using the project() method of the camera class. Then, it unprojects these 2d points into 3d world. If the project() and unproject() methods are correct, the 3d point must be same as the back projection of its projection. This test file checks this equality and it is checked for each camera type.

Part 2

The robust curve fitting is using cauchy robustifier. We are using least-squares cost function. It works very effectively for the Gaussian noises but if there are outliers, the error for these outliers is higher and its square is much higher. To reduce their effects on the optimization problem, we are using linear costs if the error is higher than the threshold and the effect of the outliers is less and the optimization results are more robust.

Part 3

"--show-gui" is to visualize the calibration process. It's true or false.

"--dataset-path" is to get 2d projections for the camera. It's string.

"--cam-model" is to define the camera type. It's string and it creates a camera type instance using this name