To calculate the optimal wing shape from the angle of attack, the cruise speed and the mass of the aircraft we first must define the criteria for an optimal wing.

In our flying wing design, we aim for the maximum range, thus the Drag should be as small as possible. This can be achieved by either lowering the induced drag or the zero lift drag. Since we already chose the aerofoil we have no influence on the zero lift drag and therefore want to reduce the induced drag, which can be achieved by choosing a high aspect ratio and aiming for a nearly elliptical pressure distribution which is directly connected to the taper ratio of the wing. Stability wise we also aim for a swept wing.

With these design criteria in mind we can develop an algorithm that optimizes for taper ratio and aspect ratio.

First, we calculate the needed wing area for the desired angle of attack, speed and the desired Lift. From these values and the specifications of foam block we can calculate the optimal geometry for a low taper and a high aspect ratio. Because we also aim for a high sweep angle we can calculate the maximum possible sweep from the tip chord and the dimensions of the foam block.

To better compare the different wing geometries we furthermore calculate the geometric and the aerodynamic centre of the wing.