HarmonicFlow:
For each vertex P_i, we check if P_i is a boundary point, if not we find all the adjacent vertex add the to $\vec{H}$ and divide by their number a_A.

$$\vec{H} = \frac{1}{n_A} \sum_{j=1}^{n_A} \vec{P_j}$$

HarmonicAreaFlow:
For each vertex P_i, we check if P_i is a boundary point, if not we find all the adjacent points and save them in the array "neighbours". First, we calculate the harmonic flow $\vec{H}$ the we calculate the area in the following way:
- Take P_i as the first element in the array
- We take every two consecutive elements in the array
The area is :

$$A = \frac{1}{2} \sum_{j=1}^{n_A - 1} (\vec{P_j P_i} * \vec{P_{j+1} P_j})$$

Finally the flow will be:

$$\vec{H} = \frac{1}{A} \vec{H}$$

VolumeConservationFlow:
Step 1: (Gradient)
For each vertex P_i, we loop over the faces and for the incident face we do the following steps:
- Find the position of P_i in this face
-We loop over all the vertices other than P_i two by two and calculate their cross product :
$detP = \vec{P_1} * \vec{P_2}$
The gradient will be array of all these detP.
Step 2: (Renormalization of the flow)
For each vertex P_i, the flow will be :

$$\vec{F} = \vec{H} - \frac{\vec{detP}.\vec{H}}{\vec{detP}.\vec{detP}} \vec{detP}$$

MeanCurvatureFlow:
For each vertex,
We used the following notations :
Q is the point we calculate the mcf for in each iteration
P_i is the predecessor of Q on face j, the successor of Q on face (j+1) and

therefore the shared vertex of faces (j, j+1)
P_{i-1} is the successor of Q on face j
P_{i+i} is the predecessor of Q on face (j+1)
$\vec{M_i}$ is the edge (P_i, Q)
We applied the following steps:
- We find the first incident face f and the predecessor and the successor of Q in f
- We iterate over the face in the right order by finding the face show contain Q and its predecessor
- The flow will be:

$$mcf[i] = \frac{-1}{2} \sum_f \frac{Q\vec{P_{i-1}} * Q\vec{P_{i-1}}}{||Q\vec{P_{i-1}} * Q\vec{P_{i-1}}||} * P_i\vec{P}_{i-1}$$

MeanCurvatureFlowCotan:
For each vertex,
We used the following notations :
Q is the point we calculate the mcf for in each iteration
P_i is the predecessor of Q on face j, the successor of Q on face (j+1) and therefore the shared vertex of faces (j, j+1)
P_{i-1} is the successor of Q on face j
P_{i+i} is the predecessor of Q on face (j+1)
$\vec{M_i}$ is the edge (P_i, Q)
$angelbefore = (Q\vec{P}_{i-1}, P_{i-1}\vec{P_i})$
$angelafter = (P_i\vec{P}_{i+1}, P_{i+1}\vec{Q})$
We applied the following steps:
- We find the first incident face f and the predecessor and the successor of Q in f
- We iterate over the face in the right order by finding the face show contain Q and its predecessor
- The flow will be:

$$mcf[i] = \frac{1}{2} \sum_f (\frac{1}{\tan angelbefore} + \frac{1}{\tan after}) * M_i$$