1. Tracking

1.1)

First, I create two matrixes call ***'track'*** and ***'track_id'***. For 'track', its size is (8*6*frame_numbers) and it stores each frame's location of player response to the first frame. The reason of its size is 8*6 is the first fame detects 8 players, so the following frames should track those 8 players. For 'track_id', its size is (frame_numbers-1*8) and it stores each frame's detection index response to the first frame's detection. For example, this is the first row of 'track_id'

1	4	7	2	9	5	2	3

In this row, 1 means the first detection in 2nd frame response the first detection in 1st frame. 4 means the 4th detection in 2nd frame response the 2nd detection in 1st frame. In our case, there are 10 rows in total.

Process:

1. If i is in first frame, create 'track' and 'track_id' matrixes.
2. Loop each frame, because 'track_id' matrix indicate which index of last frame represent which player, we just need to find the max similarity in that index.
3. Update track and track_id matrix
4. Plot images

1.2)

Please visit tracks.zip file for detail

1.3)

We can remember last frame's location of each player, when we do detect on next frame, we can pay attention on the location around last frame, such as lower the threshold, etc. Because interval of each frame is very short, player shouldn't run so far.

1.4)

We need to compute a homography that maps the 4 corners. (maybe we can use rectangle in front of the net). And then do the homography transformation. Then we can calculate how far each player move in each frame, so that we know which player is running the fastest.