Q1:

Suppose the robot is always looking for the lower right corner, wherever its initial position is, firstly, it senses s4 cell. If s4 is free, move east, then senses new s4 cell. Repeat moving east, until its s4 is not free, then senses robot’s s6 cell. If s6 is free, move south, then senses the new s6 cell. Repeat moving south, until robot’s s6 is not free, now the robot is in the lower right corner.

Q2:

1. The inputs(x1, ..., x5) can be either 1 or 0, weight of x5 is 0.5, whether x5 is 1 or 0, it never makes difference to whether the threshold can be passed or not. So ignore x5, it need not show up in the boolean function.

2. Easily to find that at least one of x1 or x2 must be ‘on’.

2.1 If x1 is on, x2 is off, x3 and x4 must be both off, then the threshold can be passed. Even if x2 is on, it makes no difference to the result. So, x2 can be ignored in the current situation. The term is: wpsoffice.

2.2 If x1 is off, x2 is on, x3 and x4 can’t both be on, then the threshold can be passed. In current situation, x1 can be ignored because it doesn’t effect the result. The boolean term is: wpsoffice.

2.3 If x1 and x2 are both on, the threshold can be passed in any way. The boolean term is: wpsoffice.

3. The final boolean function which following the TLU implement is: wpsoffice.

Q5:

1. According to north.csv, I found that only s1 or s8 equals to 1 and s2 and s3 can’t be 1, the robot will move north, so the boolean expression corresponding to the perceptron for the move north action is: wpsoffice