z5173405 JIE MEI

Question 2

We need to solve this problem with greedy strategy. After the game starts, it can appear as the following 3 different situations.

1. If $P_b < R_a$: we need to throw out all the paper, and then we throw rocks until the opponent's rocks are all thrown. Then if $S_b > P_a$: We throw out the scissors until all the opponent's paper is finished, then we throw the remaining rocks and finally throw out the remaining scissors. Else if $S_b < P_a$: We throw out all the scissors and throw out all the remaining rocks.
2. If $P_b > R_a$: we will throw papers until the opponent's stone is thrown. We will have some papers left. Then if $S_b > P_a$: We throw out the scissors until all the opponent's papers are finished, then we throw the remaining rocks and throw out the remaining scissors. Finally throw out remaining papers. Else if $S_b < P_a$: We throw out all the scissors then throw out the remaining scissors. Finally throw out all the papers.
3. If $P_b = R_a$: we will throw all the papers. Then if $S_b > P_a$: We throw out the scissors until all the opponent's papers are finished, then will throw out all the rocks. Finally, we throw out the remaining scissors. Else if $S_b < P_a$: We throw out all the scissors then throw out all the rocks.

The idea of summing up the whole algorithm is to throw if there is something that can beat the opponent. If not, see if there is the same as the opponent in the hand, and throw it directly. If not, you can only lose points.