

Please note that there will be zero tolerance for dishonest means like copying solutions from others, and even letting others copy your solution, in any assignment/quiz/exam. If you are found indulging in such an activity, your answer-paper/code will not be evaluated and your participation/submission will not be counted. Second-time offenders will be summarily awarded an F grade. The onus will be on the supposed offender to prove his or her innocence.

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1. We have five boxes, a red, a pink, a white, a black, and a green one, and ten balls, 2 red, 2 pink, 2 white, 2 black, and 2 green ones. The task is to put the balls, if possible, into the boxes such that:
  - (a) Into each box, we should put two balls the color of neither of which is the same as that of the box.
  - (b) There should be no pink ball in the red box.
  - (c) There should be a box of neutral color with a red and a green ball inside (the neutral colors are: black and white).
  - (d) The black box should contain balls of cold color (the cold colors are: green and pink).
  - (e) There should be a box with a white and a pink ball inside.
  - (f) There should be a black ball in the pink box.

Your task is to write a Prolog program that outputs a string describing the arrangement that satisfies the above conditions. The format of the output should be **RPWBGRPWBG** – a string of length 10, where each letter denotes the color of a ball, and the first two letters denote the balls in the red box, the next two letters denote the balls in the pink box, the next two denote the balls in the white box, the next two letters denote the balls in the black box, and the last two letters denote the balls in the green box. Essentially, the order of the boxes is fixed (red, pink, white, black, green), and you just need to output the initials of the color of the balls. If there is no solution, your code should output **IMPOSSIBLE**.