Problem 1
Consider a set of shapes \{square, triangle, rectangle, circle\}. We are given two colors, blue and red. We would like to choose 4 shapes. They could be anything we want; for instance, they can all be squares. In addition, we want to color two of them blue, and two of them red.

(a) Find two good representation to count this problem. In the first representation, you have to use "?" with color. In the second representation, you have to use "!!" with color. Make sure to think about the two golden questions.

(b) Assume now that we actually start with 4 colors, and we want to use 2 of them. Solve the problem with split counting (i.e. using one and all). Use an unordered set for the choice in your first part of the program. Try to incorporate both representations you got in (a). For the second one, simplify the program by eliminating "!!".

(c) Comment on the use of an ordered choice in the first part. What problems do we face if we do that? Why does it become difficult to adjust the program? Hint: this has to do with the fact that shape is reusable.

(d) What if we change the requirements in terms of color so that we need to use both blue and red but we do not require to divide the colors in half? Hint: Use exclusive representations with your solutions from (b).

Problem 2
Please provide feedback in the best way you can about your experience with this course. You might want to remain anonymous on this part, in this case, you may type it and omit your name and submit it to the department office. Regardless, this will not be graded in anyway. Thank you.