TMIRI

Writing Test
May 2020. Duration: 120'

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1. (4.5 points) For each one of the following examples, write a mathematical expression that defines the general concept.

   - Consider that we have two vectors of equal size such as $(1, 5, 3, 6)$ and $(8, 12, -6, 2)$. I want to define the vector that intercalates the elements $(1, 8, 5, 12, 3, -6, 6, 2)$
   - consider that we have a set of integers such as $\{3, 5, 2, 10\}$. I want to define the set that contains the sum of its subsets. For instance, 8 will be in that set because $8 = 3+5$. Same for 17 because $17 = 5+2+10$. Note that in this particular example the set that we want to define will have at most 2^4 elements because this is the number of subsets.
   - Consider a square matrix such as,

     $$\begin{bmatrix} 7 & 1 & 10 & 6 \\ 2 & 0 & 6 & 3 \\ -4 & 5 & 9 & 2 \\ 6 & 6 & 8 & 7 \end{bmatrix}$$

     We want to define a matrix of the same size that preserves the elements on the boundaries and has zeros inside the boundaries. In the example that is,

     $$\begin{bmatrix} 7 & 1 & 10 & 6 \\ 2 & 0 & 0 & 3 \\ -4 & 0 & 0 & 2 \\ 6 & 6 & 8 & 7 \end{bmatrix}$$

2. (5.5 points) During a few minutes I will show you how to play a game that you will have to describe. You must find the right level of abstraction and precision. As for abstraction, there are elements that are completely unrelated to what really matters in the game (e.g. clicking on a cell vs selecting a cell). As for precision, be as formal as possible without letting the formality obfuscate the text.

Each part of the exam has to be delivered uploading a picture with your hand-written solution to the raco".

After delivering the two parts, you have until the end of the day to **upload a pdf** electronic version of your exam generated with latex to the Racò. The electronic version **must be identical** to the manuscript except for editing aspects (italics, bold face, indentation,...)