The key idea here is to convert each of these infinite 2-dimensional tapes into 1-dimensional tapes. Since the given Turing machine computes in time , that means each tape’s pointer doesn’t move up more than steps, doesn’t move right more than steps, doesn’t move down more than steps, and doesn’t move left more than steps, for a resulting upper-bounding, square-shaped space of cells around the starting point for the pointer to move around. In our new Turing machine, then, we start with the register pointing to the ’th cells in each tape (the center of the bounding square). Whenever the original Turing machine moves up, our transition function makes it move left ; whenever it moves down, we make it move right ; whenever it moves left, we move left just the same; and whenever it moves right, we move right just the same. The original Turing machine moves up or down at most times, and for each of those, our Turing machine does it in time, making our Turing machine compute in time.