In an introductory course of probability students are typically taught the theory and no simulation methods. For the most part, textbooks and instructors will mention briefly that one can conduct simulations based on the empirical probability but that is it! Few elaborate on this topic. Using simulation to illustrate concepts of probability may lead undergraduates to understand topics better and tackle problems that otherwise might no be possible. In this talk we illustrate how using MATLAB simulation can be used as complementary tool to study probability. Computer simulations of classical results are presented and difficult problems are tackled. We hope this talk will encourage other instructors and authors to discuss computer simulations early on their respective courses. (Received July 14, 2015)