

This work discusses Brownian motion and its basic transformations. The work describes basic properties of its trajectories and shows that Brownian motion is a martingale and a self-similar process. Next, we discuss time series analysis. We introduce graphical tools for analyzing data and we describe theoretical basics of some normality and independence tests. Finally, we consider the hypothesis that in the short run the price of financial assets can be modelled by Brownian motion. We conduct basic statistical tests on real data using the R program and we talk through our results.