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Khoi N Vo* (duykhoid1402@gmail.com), Fountain Valley, CA. *Weak Laws of Large Numbers and two interesting applications.*

Recent studies in Mathematical Analysis have developed a new powerful tool called Measure Theory. Since then, many other branches of science, in particular, probability and statistics, have adopted this tool to solve many problems. This project considers, in particular, the Law of Large Numbers. We will start by establishing the critical background measure theory that we will be using. After that, we will consider applications of probability in real world, including the famous St Petersburg's Paradox and unfair fair games. The first application are the study of what happen with a very large data sample ,which we considered to be infinite, comes from a simply predictable outcomes. The result of this seemingly simple experiment turned out to be extremely paradoxical, even through rigorous mathematical reasoning and examination. The second application was a study of same type of large data sample but performed on an unpredictable outcome. And yet, the second application gave another surprising result. In conclusion, it was a great discover of the nature of universe (infinity), that is, full of uncertainty and paradox, and that even through rigorous mathematical reasoning, we will still all be surprised. (Received July 26, 2015)