YNG- Randomness

We humans are good at a lot of things, but one thing we are not good at is randomness. What is randomness? Why are we not good at it and why does it matter? All are really good questions. We are going to explore this topic, find out why it's important, how we can be more truly random and what the benefits are to people.

First, let us look at what randomness is. Random is defined by The Concise Canadian Oxford Dictionary as: 1 made without method or conscious choice 2 (a) with equal chance for each item (b) given by a random process. At random without aim or purpose or principle. Randomness is the adverb for random, eh? You did notice it comes from the Canadian version. So, randomness is the result of equally probable outcomes for a series of events. Rolling a standard dice produces equal chances of getting a number between 1 and 6. Flipping a coin has equal chances of either heads or tails coming up. Another important part of randomness is that the occurrence of any particular outcome is not predicated on the previous outcome. To say this another way, if we flip a coin and get heads, then the next flip is just another equal chance of heads or tails. The previous flip does not have some kind of supernatural influence on the next flip.

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The next flip is always an equal chance of the possible outcomes.
If you rolled the number four, three times in a row, then the next roll is a one in six chance of getting a four. There is not going to be some incredible drought in rolling fours for the next group of rolls as if you somehow magically used up all the fours for a while.

This leads us into the next aspect of randomness, and it is true that humans are not good at being random, being able to make random choices, or being able to predict outcomes in random games of chance. Think about a magician. If they ask you to choose a number between 1 and 10, what would you think of? Most people pick 7. That's weird, but true. We tend to have favorites, and we tend to have routines and cycles.

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Most things we have in our lives revolve around routines, from sleeping at the same time, for the same duration, eating three meals a day at the same time, working at the same place at the same time and getting dressed. What sock you put on first, likely the right. You almost always do

these things in the same way. When you go to your favorite restaurant, you tend to order the same thing repeatedly. We are creatures of habit, and when we have choices, we tend to stick with what we know and behave in a repetitive manner. It's not a bad thing to be comfortable, predictable, or consistent, and we know we find comfort in our patterns. We find peace in the cycles in our lives, and this is almost always good. However the trade-off is that we are not good at being random.

The next reasonable question now is, when is randomness good? Randomness can have a variety of applications as it relates to research, quality control, inspections, gaming, fun games, cryptography, computing, simulators, statistics, and various other purposes. This is starting to sound pretty heavy, but we can examine a few of the examples we have listed to see how true randomness can have real functions in our lives. Since randomness is really hard for humans to conjure, we can look at tools which provide a source of randomness. The examples we looked at earlier of flipping a coin or rolling a dice do produce random outcomes, although they work, they are not particularly practical ways to make selections, and the record of them is subject to human error. Most computers rely on a random number generator, but these can be run from parameters which only create number strings which are always the same at the start or have periodic repeating. There are some computer chip manufacturers that have developed highly specialized chips to produce randomness to a quality standard, which the National Institute of Science and Technology recognizes by this standard (NIST- SP800).

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This can provide to users a level of assurance that the source is of a very high standard. Your Number Guaranteed has created a tool, or Token, which is a large collection of True Random Numbers between 0 and 999. The Token is an indexed three-dimensional file with 1,000,000,000 sets of random three-digit numbers. With this Token, Tool, or number set, users can drive their applications for whatever task they choose. We are going to provide two simple tasks which are driven by randomness.

The first task is at airport security. When fliers board airplanes, they are subject to a security screening. The screening process has many levels, and some people are chosen for very in-depth inspections. Human bias being what it is makes it very hard to leave the selection process to people. If we want to have a truly random and fair way to select fliers for screening, that process is best left to a randomness tool. A great tool would be Your Number Guaranteed, because it is known, transparent and completely random and absolutely unbiased. If the TSA screeners had a display showing a random number for each person to be subject to a more thorough search, and people saw the

numbers for each person, and knew what numbers were being selected, then they would know with a high level of confidence how the system worked, and know it is fair. So, if the TSA had a mandate to inspect one in fifty people in a thorough manner, they could pick numbers that end in 33 and 47 for any particular day. So, if 033, 133, 233..933 or 047, 147, 247…947 comes up on the display as people go through security, then those people are selected for in depth inspections. This system picks twenty people for every 1000, or as we wanted to select, one in fifty. It is simple, it is communicable to the flying public, it is secure, it is fair, and it removes any human bias from the process. This same process can be applied to other tasks such as quality control at a manufacturing facility. Quality control professionals may test parts or products during the manufacturing process. Tests of such important properties as weight, size, colour, temperature, viscosity, bacteria count, taste, smell, and many other factors are important to manufacturing quality. Choosing samples from production runs can be highly subjective, many times chosen for convenience or out of habit, meaning the samples are not a real representation of a random sample.

The second task of randomness can be of value in conducting research. The selection of groups by randomly assigning subjects is critical to ensuring an outcome which will be accepted by the peer community of researchers. Random assignment of subjects is essential. The removal of selection biases of subjects must be made to prove that the effects which are being tested for are in fact the result of the thesis which is being examined, and not manipulated in any manner. Furthermore, using a known, qualified distribution tool, which can be examined, and is recognized to comply with quality standards provides the researchers with unimpeachable integrity. Many aspects of research need to be examined during peer review and it can be an assuring factor when peers know and can validate subject selection as being done to the highest standard of randomness. If a research group assembles a subject pool, and then defines how they are going to assign subjects to Pool A and Pool B, and decides Pool A is even numbers and Pool B is odd numbers, and that the starting point in the random number selection X,Y,Z cell and counts up from that point, and then purchases a Your Number Guaranteed Token, there is zero chance any manipulation can occur. Most researchers are well intentioned, but with this system, you are also objectively unquestionable in this aspect of your methodology.

The challenge going forward in our lives and in our businesses is how we will use this new-found knowledge and this new tool to enhance our lives? Many people will be breaking new ground in ways that they had not thought of just a year ago. As we investigate randomness, and we find tools we can use to enhance our processes we can incorporate them into our lives and our businesses. We need to think about other new uses for the Tool, Your Number Guaranteed, and we need to share them with our friends, and business partners. Writing, communicating on social media, adopting them into your business will make great improvements in what we do. Creating partnerships is something that can help your customers or clients, and your bottom line. So, there is the challenge, create some new applications with this new tool!