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Video games have been a big part of my life ever since I was little. While I played a variety of different games from the company named Nintendo and their lines of games and consoles. As I grew up, I slowly shifted away from Nintendo when being shown the wider world of video games, but it will always have a special place in my childhood. As I grew up the way I thought about video games changed. Initially I would only think about the adventures the characters went on but eventually what I was learning about in school applied to videogames . So I thought it would be interesting to combine what I’ve been studying in statistics with my love of videogames. So I found a large data set of over 16 thousand games and other related information to use for my purposes and got to work.

The first thing that I wanted to do was some basic problems to get a better understanding of the data set. I was curious to see which year had the most games released in it, so I decided to start there. After calculating to find that the answer was 2009, which while not the year I was hypothesizing that being 2010 due to better memory of those games coming out is not a total surprise on looking back. What I started to think about next was when games were released was what year would about fall into the middle in relation to the range of 1980 to 2020. After calculating it came to be the year 2007, which seemed weird at first until looking at the data set showed it doesn’t have a lot of modern games in its list. Now it was time to go to the big question, what are the average sale of video games in the United States of America? That number came out to be about 268,000 units. Which makes sense to me since some games sold over 10 million copies on their own and others barely sold 10 thousand leading large divides between games at times. This was interesting when you see that the graph has a variance and standard deviation of 674,000 and 821,000 respectively. This means that most of the games on this list would fall outside of the expected graph.

As I was looking through the data set it got me to think about my time playing these games. One of my favorite aspects besides playing the games was having a shelf to display them all which helped me to remember which games I beat, which I wanted to play next, and other which always made me excided for the next time I had a chance to play. I then thought if I took one game from each of the 572 companies in the data set and then take 3 of them and put them on a shelf how many different ways could you organize the games on that shelf. Well as it turns out there 31,028,140 different combinations of games which can be organized on that theoretical shelf which is insane when you think about it. However that number is nothing compared to the 1,861,688,840 different permutations of those same three games on the shelf games. This got me thinking about my old Wii and all the great games I used to play on it. If we know that the probability of a game being made by Nintendo in 2009 is 2% what are the chances that a randomly picked game is from 2009 knowing that is was made by Nintendo? That a comes out to be around 53% which reminds me of the control that Nintendo had a one point.

While organizing my games it got me to thinking about the bargain bins at some stores that had games. It was always cool to dig around to and see what games you could find. Sometimes games from different consoles were mixed together which made it sometimes hard to find what you wanted. Which made me think with a bin full of games what would it take to find a game for the Wii. For example let’s say that there is a 8% of pulling Wii game from the box and I had to pull five games out of the box with each game being equally likely what are the chances two of those pulled games were Wii games. The binomial distribution probability of that is about 5% which is how it felt sometimes to basically swim through the bargain bin to find something. This relates to another feeling of pulling game after game not seeing anything you wanted or something you cant buy. For example you pull games from a box with each one being equally likely what are the odd with a 8% chance that the fifth game pulled is a Wii game. The Geometric distribution probability comes out to be around 6%. One of the other memories I have as a kid was the occasional struggle to find a non-used game at the store. While they were typically the cheaper options it was a gamble on if the game worked properly. So as a kid I always tried to avoid used games for this reason. An example of this is a box contains 10 games, 5 of which are used which most likely means they don’t work what are the odds that you pull three games and none of them being used. The hypermetric Distribution comes out to be about 8% which is around what I expected because back in the day used games where everywhere. but sometimes I took real persistence to rummage through bins of junk to pull what you want sometimes you would look only to find all the good games were gone. An example is going through a bin full of games that you know has a 8% chance of pulling a Wii game from what would be the probability of pulling your second Wii game on the 5th attempt? The Poisson Distribution would come to about 2% which at one point for Nintendo really felt like what it was to get their newest games. While stores like GameStop are not as popular as they used to be it was a sight to behold to see people line up for the newest games, while now it seems hard to see 10 people in a store at one time. Which lead me to thinking if a store has an average customers of 4 per hour, what is the probability 4 games are bought in an hour? This comes out to about 20% which helps to show the change in how people see these stores. It was once one of my favorite memories in the mall to stop at the GameStop and see all the newest game and all the foot traffic that the store had. It made it easy for stores to predict how many people would show up. An example is that we know on average of 20 go into the store on a given. Day with a standard deviation of 2 what would be the probability that the store would get more that 16 customers but less than 24? That Tchebysheff’s distribution comes to about 75%.

Sometimes gaming companies would release special versions of games, which usually meant the game came with a sticker or something similar which they would randomly distribute between boxes of regular games. For example if a box of full of five games and each on had a 50% chance of being the special version of the game what is the probability for each game in the box being the special version? The Cumulative Distribution function for the box to have zero special games is about 3%, for one to be special it is about 16%, for two it’s about 31%, for 3 its 31%, for 4 its 16%. And finally for the box to have five special games is about 3%. Sometimes during the holidays it was a mad dash for the best deals and games and sometimes it was hard to keep up. Let’s say that a stores arrival of customers at a checkout counter follow a Poisson distribution. We know that, during a any 30-minute period, one customer will go to the counter. What’s the probability that the customer arrived during the last 5 minutes of the period? That Uniform probability distribution comes to about 17%. During those holidays the game sometimes would fly of the selves before you knew it. An example of this is a GameStop with a an approximately exponential distribution with a mean of four. What would be the probability that they would sell over 10 games in a one-hour period? This Gamma Probability Distribution is about 8%.

The anticipation of holding a new game in your hand while at the store to me as a child was one of the best feelings next to Christmas. That feeling could not dwindle even as I was forced to wait in the long lines these stores had with the slowest lines in the world, to a hyperactive ten-year-old at least. an example of this type of situation is A game store has empty three counters. Two customers arrive at the counters at different times and decide on which counter to go without any influence from each other. Let x be the amount of customers at counter 1 and y be the amount of customers at counter 2, what is the joint probability function of x and y. The chart below shows the joint probability for this situation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | X | | | |
| Y |  | 0 | 1 | 2 |
| 0 | .11 | .22 | .11 |
| 1 | .22 | .22 | 0 |
| 2 | .11 | 0 | 0 |

Sometimes games would bring people together in the unity of the exciting a game bring people but sometimes it even created rivalries. One of the bigger rivalries that I can think of when the Pokémon games Dimond and Pearl released in the United States, people were arguing which of the two games was better, I was not into Pokémon at the time so it was confused why people who like the same game fancies would fight each other, I fully understood years later when I joined the console wars for Xbox. When it came release day, they were both there ready to be first in line. An example of this is 6 people walk into the store at the same time. three prefer Dimond, two prefer Pearl and one is going to buy the bundle for both games, two are selected randomly to pay first. Let x represent the Dimond supports, and y represent the Pearl supporters. Find the joint probability function of x and y and then find the marginal probability function of y. the joint probability is best shown by this chart:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | X | | | | |
| Y |  | 0 | 1 | 2 | Total |
| 0 | 0 | 3/15 | 3/15 | 6/15 |
| 1 | 2/15 | 6/15 | 0 | 8/15 |
| 2 | 1/15 | 0 | 0 | 1/15 |
| Total | 3/15 | 9/15 | 3/15 | 1 |

The marginal probability of Y comes out to be P(0) = 6/15, P(1) = 8/15, and P(2) = 1/15.

It was interesting to look back at my experiences gaming and relate it to the statistics I’m learning about years later. I always find going back to things with a new perspective to be one of the most interesting things people can do in life. Like before school, videos were just a fun activity that I used to put off doing school. Now I can see that everything I’ve been taught relates back to everything how math and stats can affect how I play and buy games, how trends can be formed and used to predict the future of gaming and gaming culture. It really does give me a new appreciation for Statistics. While I may know a lot more than when I was younger, I still have an intense passion for video games that has only increased with time at an exponential rate and will continue to grow and change as I continue to learn from school and life. I’ll be interested to see what topic will surprisingly be connected to video games next.