FINAL PROJECT CS 131: INTEREST RATE AND APY%

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BITCOIN BRIEF DETAIL

- Bitcoin is virtual currency or a digital currency. It is like an online version of cash. You can earn bitcoins without having to put down for it. It was first made by Satoshi Nakamoto in white paper, assumed that he had owned 1.1 Million bitcoins

GLOBAL ISSUES ON BITCOIN AND LIFE CHANGING SITUATION

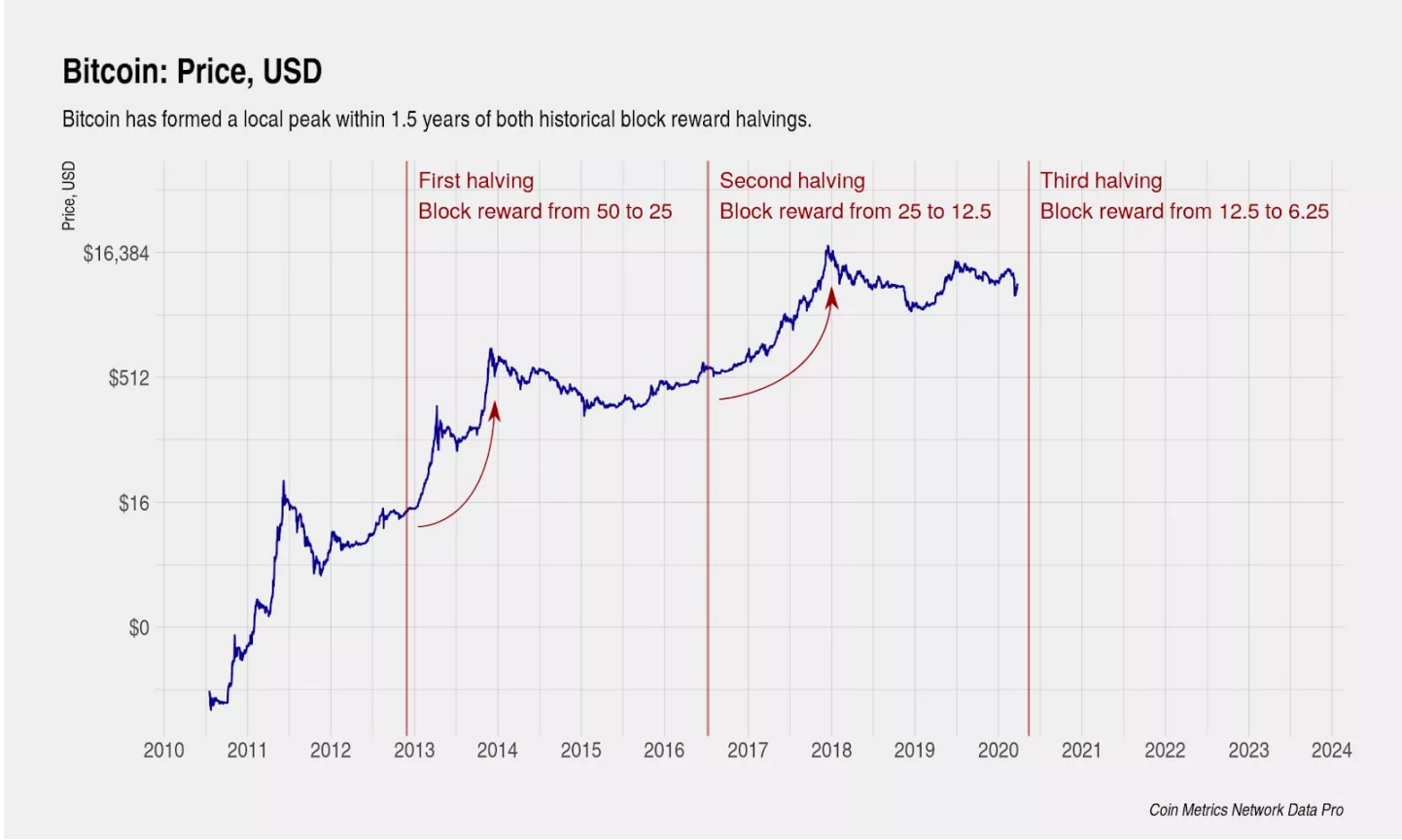
- Now Bitcoins have dropped because Tesla guy. He suspended vehicle purchases using bitcoin by the so-call mining process. It was the high power of a supercomputer to solve the complex mathematical puzzles to enable transactions using bitcoin. He wiped 300 $billion dollars in that day.

OPTIMAL DECISION IN GAME THEORY FOR TRADING

- Game theory is the study of strategic decision-making, bringing mathematics, psychology, and philosophy. It was modern analysis and decision-making. Crypto-economics examine the behavior of the network nodes based on the incentives provided by the protocol, considering the most rational and probable decisions.
- One of the biggest theories is **The prisoner's dilemma; it** was like game splitting who split will win and get all the money. But both give up; they will both will be divided.

HAVLING TIMELINE IN CRYPTOGRAPHY PRICES

Halving is making mining process for miners to have less coin from 50 to 25 to 12.5 and 6.25. But on the graph, we know halving with limiting supply and circulation making an impact for the price of bitcoin to go up and will be greater and greater. We will notice how to purchase and sell digital coins during the previous time of stock shift, and the caping market is down as of now. 300 billion were taken off, but it might be a hard situation for us to have a chance to become rich again continually.



RECURSIVE FUNCTION SAMPLE

Certain operations performed on objects can be defined recursively • Examples: – A recursive definition of multiplication:

• m * 1 = m

• m * n = m * (n-1) + m, for n >= 2

– A recursive definition of exponentiation: • a0 = 1 • an = (an-1)*a, for n > 0

– A recursive definition of factorial operation:

• F(0) = 1

• F(n) = n * F(n-1) for n >= 1

RECURSIVELY ALGORITHMS & BY LOOPING

- Calculate S(n):

```
if n = 1 then
return 2
Else
 return 2*S(n-1)
endif
```

Calculate S(n):

```
if n = 1 then output 2 and return
 j = 2
S = 2
while j <= n
 S = S*2
j = j + 1
 end while
output S
```

• If a recurrence relation exists for an operation, then the algorithm for such a relation can be written either iteratively or recursively • Example: factorial, multiplication, etc. • Factorial: $S(1) = 2$, $S(n) = 2S(n-1)$ for $n >= 2$

DIFFERENT IN APR% AND APY%

- Simply put, APR is the interest rate stated as a yearly rate. It measures the amount of interest you'll be charged when you borrow. And APY is the measure of the interest you earn when you save. They may seem similar, but they're actually very different. And understanding the differences can help you make good decisions about managing your money. Read on to learn how.
- APY stands for annual percentage yield.
- Savings account, Money market account, Certificate of deposit (CD).
- APR stands for annual percentage rate. It typically applies to money you borrow, like with a
- Credit card, Car loan, personal loan, home loan or student loan, Personal line of credit or home equity line of credit.

CALCULATION OF APY%

- The calculation of the annual percentage yield is based on the following equation:
- $APY = (1 + r/n)^n - 1$
- where:
- r - the interest rate
- n - the number of times the interest is compounded per year
- **Single Annual Payment Example:** Let's say that you deposit $1,000 in a savings account that pays a 5% simple annual interest rate. If your bank calculates and pays interest only once at the end of the year, the bank would add $50 to your account. At the end of the year, you would have $1,050 (assuming your bank pays interest only once per year).
- **Monthly Compounding Example:** Now, assume that bank calculates and pays interest monthly. You would receive small additions every month. In that case, you would end the year with $1,051.16, which is more than the quoted interest rate of 5%

Period	Earnings	Balance
1	$ 4.17	$ 1,004.17
2	$ 4.18	$ 1,008.35
3	$ 4.20	$ 1,012.55
4	$ 4.22	$ 1,016.77
5	$ 4.24	$ 1,021.01
6	$ 4.25	$ 1,025.26
7	$ 4.27	$ 1,029.53
8	$ 4.29	$ 1,033.82
9	$ 4.31	$ 1,038.13
10	$ 4.33	$ 1,042.46
11	$ 4.34	$ 1,046.80
12	$ 4.36	$ 1,051.16

SAMPLE CODE OF CALCULATION APY

```
float computeRecursive(float Balance, float ir=0, int time=0)
{
    if ( time == 0 ) { return Balance; }
    float interest = Balance * ir/100;
    return computeRecursive(Balance + interest, ir, time-1);
     }
```

GOODBYE CS 131

- Thanks to everyone for this semester and the ongoing situation. It is a great time to spend in this class, and I have time to study computer science's theory side as an engineering student.
- Appreciated faculties and staff as making this semester wonderful with good experience to using in the future.