

Assignment Week 7-8 Term Project

Milestone-3 Cleaning/Formatting Website Data

'''

Name : Karthikeyan Chellamuthu

Date : 05-08-2022

'''

```
In [2]: # Importing necessary libraries for both step1 & Step2
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from bs4 import BeautifulSoup
import codecs
import os
%matplotlib inline

import warnings
warnings.filterwarnings("ignore")
```

```
In [4]: '''In milestone 3 we will be cleaning and formatting the website data, using two dif
previously we did analyzed the historical trend of the given data for various digital
We have applied all the transformation on csv files (data) and created a final dataset

In this week we will be clean/transform website data that we considered from this website
'''
```

```
Out[4]: 'In milestone 3 we will be cleaning and formatting the website data as part of step
:1 we would like to do further analyze of the digital currency for further investments.
Previously we did analyzed the historical trend of the given data for various digital
currency and see the price fluctuation is high compared to the trading price of
stocks. We have applied all the transformation on csv files (data) and created a
final dataset with can be used to make a join with other type of datasets.

In this week we will be clean/transform website data that we considered from this
website link https://en.wikipedia.org/wiki/List_of_cryptocurrencies. We will consider
the details about various cryptocurrencies available in the below website page
(Wikipedia). The details available in the below page contains metadata about various
cryptocurrencies.'
```

```
In [5]: # Step 1:

# Reading website data using BeautifulSoup library available in Python

fd = codecs.open("List of cryptocurrencies - Wikipedia.html", "r", 'utf-8')
soup = BeautifulSoup(fd)
fd.close()
```

```
In [6]: # Find the metadata structure you will need to deal with including the total number
```

```
all_tables = soup.find_all("table")
print("Total number of Objects: {}".format(len(all_tables)))
```

Total number of Objects: 14

In [7]:

```
# Create a for loop to perform the table list and display the tables names. this is

i = 1 # i is declared to 1 for printing the table result set
for table in all_tables:
    if table.findParent("table") is None:
        print("\nTable {} present in the webpage considered for analysis\n".format(i))
        print(str(table))
        i = i+1
```

Table 1 present in the webpage considered for analysis

```
<table class="wikitable sortable jquery-tablesorter" style="text-align: left; width:
auto;">
<thead><tr>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g">Release
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g">Currency
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g">Symbol
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g">Founder(s)
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g"><a href="https://en.wikipedia.org/wiki/Hash_function" title="Hash function">Hash
algorithm</a>
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g">Programming language of implementation
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g">Consensus mechanism
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g">Notes
</th></tr></thead><tbody>
<tr>
<th>2009
</th>
<td><a href="https://en.wikipedia.org/wiki/Bitcoin" title="Bitcoin">Bitcoin</a>
</td>
<td>BTC,<sup class="reference" id="cite_ref-Dixon_2-0"><a href="https://en.wikipedi
a.org/wiki/List_of_cryptocurrencies#cite_note-Dixon-2">[2]</a></sup> XBT, <b>฿</b>
</td>
<td><a href="https://en.wikipedia.org/wiki/Satoshi_Nakamoto" title="Satoshi Nakamot
o">Satoshi Nakamoto</a><sup class="reference" id="cite_ref-3"><a href="https://en.wi
kipedia.org/wiki/List_of_cryptocurrencies#cite_note-3">[nt 1]</a></sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/SHA-2" title="SHA-2">SHA-256d</a><sup cla
ss="reference" id="cite_ref-4"><a href="https://en.wikipedia.org/wiki/List_of_crypto
currencies#cite_note-4">[3]</a></sup><sup class="reference" id="cite_ref-steadman201
3_5-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-ste
adman2013-5">[4]</a></sup>
</td>
```

[C++](https://en.wikipedia.org/wiki/C%2B%2B "C++")^{[\[5\]](https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-6)}

[PoW](https://en.wikipedia.org/wiki/Proof-of-work_system "Proof-of-work system")^{[\[4\]](https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-steadman2013-5)}^{[\[6\]](https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-ReferenceA-7)}

The first and most widely used decentralized ledger currency,^{[\[7\]](https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-8)} with the highest market capitalization.^{[\[8\]](https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-9)}

rowspan="2">2011
Litecoin LTC, Ł Charlie Lee Script
C++ ^{[9]}
PoW
One of the first cryptocurrencies to use script as a hashing algorithm.
Namecoin NMC Vincent Durham ^{[10]} ^{[11]}
SHA-2
C++ ^{[12]}
PoW
Also acts as an alternative, decentralized DNS .
2012
Peercoin

```

<td>PPC
</td>
<td>Sunny King<br/>(pseudonym)<sup class="noprint Inline-Template Template-Fact" style="white-space:nowrap;">[<i><a href="https://en.wikipedia.org/wiki/Wikipedia:Citation_needed" title="Wikipedia:Citation needed"><span title="This claim needs references to reliable sources. (May 2019)">citation needed</span></a></i>]</sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/SHA-2" title="SHA-2">SHA-256</a><sup class="noprint Inline-Template Template-Fact" style="white-space:nowrap;">[<i><a href="https://en.wikipedia.org/wiki/Wikipedia:Citation_needed" title="Wikipedia:Citation needed"><span title="This claim needs references to reliable sources. (May 2019)">citation needed</span></a></i>]</sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a><sup class="reference" id="cite_ref-14"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-14">[13]</a></sup>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-work_system" title="Proof-of-work system">PoW</a> & <a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-stake" title="Proof-of-stake">PoS</a>
</td>
<td>The first cryptocurrency to use both PoW and PoS functions.
</td></tr></tbody><tfoot></tfoot></table>

```

Table 2 present in the webpage considered for analysis

```

<table class="wikitable sortable jquery-tablesorter" style="text-align: left; width: auto;">
<thead><tr>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Currency
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Symbol
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Founder(s)
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending"><a href="https://en.wikipedia.org/wiki/Hash_function" title="Hash function">Hash algorithm</a>
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Programming language of implementation
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Consensus mechanism
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Notes
</th></tr></thead><tbody>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Dogecoin" title="Dogecoin">Dogecoin</a>
</td>
<td>DOGE, XDG, Ð
</td>
<td>Jackson Palmer<br/>& Billy Markus<sup class="reference" id="cite_ref-15"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-15">[14]</a>
</sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/Scrypt" title="Scrypt">Scrypt</a><sup class="reference" id="cite_ref-dogeintrotech_16-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-dogeintrotech-16">[15]</a></sup>
</td>

```

[C++](https://en.wikipedia.org/wiki/C%2B%2B "C++")^{>[\[16\]](https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-17)}

[PoW](https://en.wikipedia.org/wiki/Proof-of-work_system "Proof-of-work system")

Based on the [Doge](https://en.wikipedia.org/wiki/Doge_(meme) "Doge (meme)") internet meme.

[Gridcoin](https://en.wikipedia.org/wiki/Gridcoin "Gridcoin")

GRC

Rob Hälford^{>[\[17\]](https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-18)}

[Scrypt](https://en.wikipedia.org/wiki/Scrypt "Scrypt")

[C++](https://en.wikipedia.org/wiki/C%2B%2B "C++")^{>[\[18\]](https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-19)}

Decentralized [PoS](https://en.wikipedia.org/wiki/Proof-of-stake "Proof-of-stake")

Linked to [citizen science](https://en.wikipedia.org/wiki/Citizen_science "Citizen science") through the [Berkeley Open Infrastructure for Network Computing](https://en.wikipedia.org/wiki/Berkeley_Open_Infrastructure_for_Network_Computing "Berkeley Open Infrastructure for Network Computing")^{>[\[19\]](https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-20)}

[Primecoin](https://en.wikipedia.org/wiki/Primecoin "Primecoin")

XPM

Sunny King
(pseudonym)^[*citation needed</i>]*]

[1CC](https://en.wikipedia.org/wiki/Cunningham_chains "Cunningham chains")/[2CC](https://en.wikipedia.org/wiki/Cunningham_chains "Cunningham chains")/[TWN](https://en.wikipedia.org/wiki/Bi-twin_chain "Bi-twin chain")^{>[\[20\]](https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-primecoin_faq-21)}

[TypeScript](https://en.wikipedia.org/wiki/TypeScript "TypeScript"), [C++](https://en.wikipedia.org/wiki/C%2B%2B "C++")^{>[\[21\]](https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-22)}

[PoW](https://en.wikipedia.org/wiki/Proof-of-work_system "Proof-of-work system")^{>[\[20\]](https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-primecoin_faq-21)}

Uses the finding of prime chains composed of Cunningham chains and bi-twin chains for proof-of-work.

```

</td></tr>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Ripple_(payment_protocol)" title="Ripple
(payment protocol)">Ripple</a><sup class="reference" id="cite_ref-psmag-23-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-psmag-23">[22]</a></sup><sup class="reference" id="cite_ref-24"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-24">[23]</a></sup>
</td>
<td>XRP
</td>
<td>Chris Larsen & Jed McCaleb<sup class="reference" id="cite_ref-25"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-25">[24]</a></sup>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/ECDSA" title="ECDSA">ECDSA</a><sup class="reference" id="cite_ref-ripple-26-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-ripple-26">[25]</a></sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a><sup class="reference" id="cite_ref-27"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-27">[26]</a></sup>
</td>
<td>"Consensus"
</td>
<td>Designed for <a class="mw-redirect" href="https://en.wikipedia.org/wiki/Peer_to_peer" title="Peer to peer">peer to peer</a> debt transfer. Not based on bitcoin.
</td></tr>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Nxt" title="Nxt">Nxt</a>
</td>
<td>NXT
</td>
<td>BCNext<br/>(pseudonym)
</td>
<td><a href="https://en.wikipedia.org/wiki/SHA-2" title="SHA-2">SHA-256d</a><sup class="reference" id="cite_ref-nxtwhitepaper-forge-28-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-nxtwhitepaper-forge-28">[27]</a></sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/Java_(programming_language)" title="Java (programming language)">Java</a><sup class="reference" id="cite_ref-29"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-29">[28]</a></sup>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-stake" title="Proof-of-stake">PoS</a>
</td>
<td>Specifically designed as a flexible platform to build applications and financial services around its protocol.
</td></tr>
</tbody><tfoot></tfoot></table>

```

Table 3 present in the webpage considered for analysis

```

<table class="wikitable sortable jquery-tablesorter" style="text-align: left; width: auto;">
<thead><tr>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Currency
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Symbol
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Founder(s)
</th>

```

Sort ascending	Sort ascending	Sort ascending	Sort ascending
Hash algorithm	Programming language of implementation	Consensus mechanism	Notes
Auroracoin	AUR	Baldur Odinson (pseudonym) ^{ [29]}	Scrypt
C++ ^{ [30]}	PoW	Created as an alternative currency for Iceland, intended to replace the Icelandic króna .	Dash
DASH	Evan Duffield & Kyle Hagan ^{ Wikipedia:Citation needed} This claim needs references to reliable sources. (May 2021) ^{ X11}	C++ ^{ [31]}	PoW & Proof of Service ^{ [nt 2]}
bitcoin -based currency featuring instant transactions, decentralized governance and budgeting, and private transactions.			

```

<tr>
<td><a href="https://en.wikipedia.org/wiki/NEO_(cryptocurrency)" title="NEO (cryptoc
urrency)">NEO</a>
</td>
<td>NEO
</td>
<td>Da Hongfei & Erik Zhang
</td>
<td><a href="https://en.wikipedia.org/wiki/SHA-2" title="SHA-2">SHA-256</a> & <a
href="https://en.wikipedia.org/wiki/RIPEMD" title="RIPEMD">RIPEMD160</a>
</td>
<td><a href="https://en.wikipedia.org/wiki/C_Sharp_(programming_language)" title="C
Sharp (programming language)">C#</a><sup class="reference" id="cite_ref-34"><a href
="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-34">[32]</a></sup
>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Byzantine_fault_toler
ance" title="Byzantine fault tolerance">dBFT</a>
</td>
<td>China based cryptocurrency, formerly ANT Shares and ANT Coins. The names were ch
anged in 2017 to NEO and GAS.
</td></tr>
<tr>
<td><a href="https://en.wikipedia.org/wiki/MazaCoin" title="MazaCoin">MazaCoin</a>
</td>
<td>MZC
</td>
<td>BTC Oyate Initiative
</td>
<td><a href="https://en.wikipedia.org/wiki/SHA-2" title="SHA-2">SHA-256d</a>
</td>
<td><a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a><sup class="r
eference" id="cite_ref-35"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurr
encies#cite_note-35">[33]</a></sup>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-work_system"
title="Proof-of-work system">PoW</a>
</td>
<td>The underlying software is derived from that of another cryptocurrency, ZetaCoi
n.
</td></tr>
<tr>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Monero_(cryptocurrenc
y)" title="Monero (cryptocurrency)">Monero</a>
</td>
<td>XMR
</td>
<td>Monero Core Team
</td>
<td>RandomX
</td>
<td><a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a><sup class="r
eference" id="cite_ref-36"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurr
encies#cite_note-36">[34]</a></sup>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-work_system"
title="Proof-of-work system">PoW</a>
</td>
<td>Privacy-centric coin based on the <a href="https://en.wikipedia.org/wiki/CryptoN
ote" title="CryptoNote">CryptoNote</a> protocol with improvements for scalability an
d decentralization.
</td></tr>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Titcoin" title="Titcoin">Titcoin</a>

```



```

</td>
<td>TIT
</td>
<td>Edward Mansfield & Richard Allen<sup class="reference" id="cite_ref-37"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-37">[35]</a></sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/SHA-2" title="SHA-2">SHA-256d</a>
</td>
<td><a href="https://en.wikipedia.org/wiki/TypeScript" title="TypeScript">TypeScript</a>, <a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a><sup class="reference" id="cite_ref-38"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-38">[36]</a></sup>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-work_system" title="Proof-of-work system">PoW</a>
</td>
<td>The first cryptocurrency to be nominated for a major adult industry award.<sup class="reference" id="cite_ref-39"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-39">[37]</a></sup>
</td></tr>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Verge_(cryptocurrency)" title="Verge (cryptocurrency)">Verge</a>
</td>
<td>XVG
</td>
<td>Sunerok
</td>
<td>Scrypt, x17, groestl, blake2s, and lyra2rev2
</td>
<td><a href="https://en.wikipedia.org/wiki/C_(programming_language)" title="C (programming language)">C</a>, <a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a><sup class="reference" id="cite_ref-40"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-40">[38]</a></sup>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-work_system" title="Proof-of-work system">PoW</a>
</td>
<td>Features anonymous transactions using <a class="mw-redirect" href="https://en.wikipedia.org/wiki/Tor_(anonymity_network)" title="Tor (anonymity network)">Tor</a>.
</td></tr>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Stellar_(payment_network)" title="Stellar (payment network)">Stellar</a>
</td>
<td>XLM
</td>
<td><a href="https://en.wikipedia.org/wiki/Jed_McCaleb" title="Jed McCaleb">Jed McCaleb</a>
</td>
<td>Stellar Consensus Protocol (SCP) <sup class="reference" id="cite_ref-auto_41-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-auto-41">[39]</a></sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/C_(programming_language)" title="C (programming language)">C</a>, <a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a><sup class="reference" id="cite_ref-42"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-42">[40]</a></sup>
</td>
<td>Stellar Consensus Protocol (SCP) <sup class="reference" id="cite_ref-auto_41-1"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-auto-41">[39]</a></sup>
</td>

```

```

<td>Open-source, decentralized global financial network.
</td></tr>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Vertcoin" title="Vertcoin">Vertcoin</a>
</td>
<td>VTC
</td>
<td>David Muller<sup class="reference" id="cite_ref-Charlton2014-02-05_43-0"><a href=
="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-Charlton2014-02-0
5-43">[41]</a></sup>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Lyra2RE" title="Lyra2
RE">Lyra2RE</a><sup class="reference" id="cite_ref-Vertcoin_Lyra2RE_Paper_11292014_4
4-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-Vertc
oin_Lyra2RE_Paper_11292014-44">[42]</a></sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a><sup class="r
eference" id="cite_ref-45"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurr
encies#cite_note-45">[43]</a></sup>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-work_system"
title="Proof-of-work system">PoW</a>
</td>
<td>Aims to be <a class="mw-redirect" href="https://en.wikipedia.org/wiki/ASIC" titl
e="ASIC">ASIC</a> resistant.
</td></tr>
</tbody><tfoot></tfoot></table>

```

Table 4 present in the webpage considered for analysis

```

<table class="wikitable sortable jquery-tablesorter" style="text-align: left; width:
auto;">
<thead><tr>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g">Currency
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
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g"><a href="https://en.wikipedia.org/wiki/Hash_function" title="Hash function">Hash
algorithm</a>
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<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g">Programming language of implementation
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<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g">Notes
</th></tr></thead><tbody>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Ethereum" title="Ethereum">Ethereum</a>
</td>
<td>ETH, ð
</td>
<td><a href="https://en.wikipedia.org/wiki/Vitalik_Buterin" title="Vitalik Buterin">
Vitalik Buterin</a><sup class="reference" id="cite_ref-46"><a href="https://en.wikip
edia.org/wiki/List_of_cryptocurrencies#cite_note-46">[44]</a></sup>
</td>

```

```

<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Ethash" title="Ethash">Ethash</a><sup class="reference" id="cite_ref-dagger_47-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-dagger-47">[45]</a></sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a>, <a href="https://en.wikipedia.org/wiki/Go_(programming_language)" title="Go (programming language)">Go</a><sup class="reference" id="cite_ref-48"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-48">[46]</a></sup>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-work_system" title="Proof-of-work system">PoW</a>, <a href="https://en.wikipedia.org/wiki/Proof_of_stake" title="Proof of stake">PoS</a>
</td>
<td>Supports <a class="mw-redirect" href="https://en.wikipedia.org/wiki/Turing-complete" title="Turing-complete">Turing-complete</a> smart contracts.
</td></tr>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Ethereum_Classic" title="Ethereum Classic">Ethereum Classic</a>
</td>
<td>ETC
</td>
<td>
</td>
<td><a href="https://en.wikipedia.org/wiki/Ethereum_Classic#Mining_algorithm" title="Ethereum Classic">EtcHash/Thanos</a><sup class="reference" id="cite_ref-thanos_49-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-thanos-49">[47]</a></sup>
</td>
<td>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-work_system" title="Proof-of-work system">PoW</a>
</td>
<td>An alternative version of Ethereum<sup class="reference" id="cite_ref-50"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-50">[48]</a></sup> whose blockchain does not include the DAO hard fork.<sup class="reference" id="cite_ref-51"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-51">[49]</a></sup> Supports <a class="mw-redirect" href="https://en.wikipedia.org/wiki/Turing-complete" title="Turing-complete">Turing-complete</a> smart contracts.
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<td><a href="https://en.wikipedia.org/wiki/Nano_(cryptocurrency)" title="Nano (cryptocurrency)">Nano</a>
</td>
<td>Nano
</td>
<td>Colin LeMahieu
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Blake2" title="Blake 2">Blake2</a>
</td>
<td><a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a><sup class="noproint Inline-Template Template-Fact" style="white-space:nowrap;"><i><a href="https://en.wikipedia.org/wiki/Wikipedia:Citation_needed" title="Wikipedia:Citation needed"><span title="This claim needs references to reliable sources. (June 2020)">citation needed</span></a></i></sup>
</td>
<td><a class="new" href="https://en.wikipedia.org/w/index.php?title=Open_Representative_Voting&action=edit&redlink=1" title="Open Representative Voting (page does not exist)">Open Representative Voting</a><sup class="reference" id="cite_ref-blockchainConsensus_52-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-blockchainConsensus-52">[50]</a></sup>
</td>

```

```
 Decentralized, feeless, open-source, peer-to-peer cryptocurrency. First to use a Block Lattice structure. || >Tether</a> |
| USDT |
| Jan Ludovicus van der Veldeclass="reference" id="cite_ref-53"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-53">[51]</a></sup> |
| >Omnicores</a><sup class="reference" id="cite\_ref-54"><a href="https://en.wikipedia.org/wiki/List\_of\_cryptocurrencies#cite\_note-54">\[52\]</a></sup> |
|  |
| >PoW</a> |
| Tether claims to be backed by >USD</a> at a 1 to 1 ratio. The company has been unable to produce promised audits.class="reference" id="cite\_ref-Bloom06202018\_55-0"><a href="https://en.wikipedia.org/wiki/List\_of\_cryptocurrencies#cite\_note-Bloom06202018-55">\[53\]</a></sup> |

```

Table 5 present in the webpage considered for analysis

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<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending"><a href="https://en.wikipedia.org/wiki/Hash_function" title="Hash function">Hash algorithm</a>
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Programming language of implementation
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Consensus mechanism
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Notes
</th></tr></thead><tbody>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Firo_(cryptocurrency)" title="Firo (cryptocurrency)">>Firo</a>
</td>
<td>FIRO
</td>
<td>Poramin Insom<sup class="reference" id="cite_ref-Ezra_2019_part_1_56-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-Ezra_2019_part_1-

```

```

56">[54]</a></sup>
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<td><a href="https://en.wikipedia.org/wiki/Merkle_tree" title="Merkle tree">Merkle tree</a> Proof<sup class="reference" id="cite_ref-MTP_57-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-MTP-57">[55]</a></sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a><sup class="reference" id="cite_ref-58"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-58">[56]</a></sup>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-work_system" title="Proof-of-work system">PoW</a>
</td>
<td>The first financial system employing <a href="https://en.wikipedia.org/wiki/Zero-knowledge_proof" title="Zero-knowledge proof">Zero-knowledge proof</a> to protect users' privacy.<sup class="reference" id="cite_ref-Ezra_2019_part_1_56-1"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-Ezra_2019_part_1-56">[54]</a></sup> It conducted the world's first large-scale blockchain election for <a href="https://en.wikipedia.org/wiki/Democrat_Party_(Thailand)" title="Democrat Party (Thailand)">Thailand Democrat Party</a> in 2018.<sup class="reference" id="cite_ref-59"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-59">[57]</a></sup>
</td></tr>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Zcash" title="Zcash">Zcash</a>
</td>
<td>ZEC
</td>
<td><a href="https://en.wikipedia.org/wiki/Zooko_Wilcox-0%27Hearn" title="Zooko Wilcox-O'Hearn">Zooko Wilcox</a>
</td>
<td><a href="https://en.wikipedia.org/wiki/Equihash" title="Equihash">Equihash</a>
</td>
<td><a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a><sup class="reference" id="cite_ref-60"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-60">[58]</a></sup>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-work_system" title="Proof-of-work system">PoW</a>
</td>
<td>The first open, permissionless financial system employing zero-knowledge security.
</td></tr>
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Table 6 present in the webpage considered for analysis

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<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending"><a href="https://en.wikipedia.org/wiki/Hash_function" title="Hash function">Hash algorithm</a>
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending"

```

```

g">Programming language of implementation
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Consensus mechanism
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Notes
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<tr>
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</td>
<td>BCH<sup class="reference" id="cite_ref-61"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-61">[59]</a></sup>
</td>
<td>
</td>
<td><a href="https://en.wikipedia.org/wiki/SHA-2" title="SHA-2">SHA-256d</a>
</td>
<td>
</td>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-work_system" title="Proof-of-work system">PoW</a>
</td>
<td>Hard fork from bitcoin, increased maximum block size from 1MB to 8MB (as of 2018
<sup class="plainlinks noexcerpt noprint asof-tag update" style="display:none;"><a class="external text" href="https://en.wikipedia.org/w/index.php?title=List_of_cryptocurrencies&action=edit">[update]</a></sup>, 32MB)
</td></tr>
<tr>
<td><a href="https://en.wikipedia.org/wiki/EOS.IO" title="EOS.IO">EOS.IO</a>
</td>
<td>EOS
</td>
<td><a class="new" href="https://en.wikipedia.org/w/index.php?title=Dan_Larimer&action=edit&redlink=1" title="Dan Larimer (page does not exist)">Dan Larimer</a>
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<td><a href="https://en.wikipedia.org/wiki/WebAssembly" title="WebAssembly">WebAssembly</a>, <a href="https://en.wikipedia.org/wiki/Rust_(programming_language)" title="Rust (programming language)">Rust</a>, <a href="https://en.wikipedia.org/wiki/C_(programming_language)" title="C (programming language)">C</a>, <a href="https://en.wikipedia.org/wiki/C%2B%2B" title="C++">C++</a><sup class="reference" id="cite_ref-auto1_62-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-auto1-62">[60]</a></sup>
</td>
<td>delegated <a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-stake" title="Proof-of-stake">PoS</a>
</td>
<td>Feeless <a href="https://en.wikipedia.org/wiki/Smart_contract" title="Smart contract">Smart contract</a> platform for decentralized applications and <a class="mw-redirect" href="https://en.wikipedia.org/wiki/Decentralized_autonomous_corporation" title="Decentralized autonomous corporation">decentralized autonomous corporations</a> with a block time of 500 ms.<sup class="reference" id="cite_ref-auto1_62-1"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-auto1-62">[60]</a></sup>
</td></tr>
<tr>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Cardano_(cryptocurrency_platform)" title="Cardano (cryptocurrency platform)">Cardano</a>
</td>
<td>ADA, ₪
</td>

```

```

<td><a href="https://en.wikipedia.org/wiki/Charles_Hoskinson" title="Charles Hoskins
on">Charles Hoskinson</a>
</td>
<td><a href="https://en.wikipedia.org/wiki/Ouroboros_(protocol)" title="Ouroboros (p
rotocol)">Ouroboros</a>, PoS Algorithm<sup class="reference" id="cite_ref-63"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-63">[61]</a></sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/Haskell_(programming_language)" title="Ha
skell (programming language)">Haskell</a><sup class="reference" id="cite_ref-64"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-64">[62]</a></sup>
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<td><a href="https://en.wikipedia.org/wiki/Proof_of_stake" title="Proof of stake">Po
S</a>
</td>
<td>A proof-of-stake blockchain platform: developed through evidence-based methods a
nd peer-reviewed research.<sup class="reference" id="cite_ref-65"><a href="https://e
n.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-65">[63]</a></sup><sup class
="reference" id="cite_ref-66"><a href="https://en.wikipedia.org/wiki/List_of_cryptoc
urrencies#cite_note-66">[64]</a></sup><sup class="reference" id="cite_ref-67"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-67">[65]</a></sup>
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ocurrency)">TRON</a>
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<td>TRX
</td>
<td><a href="https://en.wikipedia.org/wiki/Justin_Sun" title="Justin Sun">Justin Sun
</a>
</td>
<td>
</td>
<td><a href="https://en.wikipedia.org/wiki/Java_(programming_language)" title="Java
(programming language)">Java</a>, <a href="https://en.wikipedia.org/wiki/Solidity" t
itle="Solidity">Solidity</a><sup class="reference" id="cite_ref-68"><a href="http
s://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-68">[66]</a></sup>
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Table 7 present in the webpage considered for analysis

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g">Symbol
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g">Founder(s)
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascendin
g"><a href="https://en.wikipedia.org/wiki/Hash_function" title="Hash function">Hash
algorithm</a>
</th>

```

```

<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Programming language of implementation
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Consensus mechanism
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Notes
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<tr>
<td><a href="https://en.wikipedia.org/wiki/AmbaCoin" title="AmbaCoin">AmbaCoin</a>
</td>
<td>
</td>
<td>
</td>
<td>
</td>
<td>
</td>
<td>
</td>
<td>
</td>
<td>official cryptocurrency of the Cameroonian separatist entity of <a href="https://en.wikipedia.org/wiki/Ambazonia" title="Ambazonia">Ambazonia</a>
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Table 8 present in the webpage considered for analysis

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</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending"><a href="https://en.wikipedia.org/wiki/Hash_function" title="Hash function">Hash algorithm</a>
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Programming language of implementation
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Consensus mechanism
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Notes
</th></tr></thead><tbody>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Algorand" title="Algorand">Algorand</a>
</td>
<td>ALGO
</td>
<td><a href="https://en.wikipedia.org/wiki/Silvio_Micali" title="Silvio Micali">Silvio Micali</a>
</td>
<td>
</td>
<td><a href="https://en.wikipedia.org/wiki/Go_(programming_language)" title="Go (pro

```


gramming language)">Go^{[67]}

</td>

<td>PoS

</td>

<td>Uses a verifiable random function to randomly select groups of users to certify blocks.^{[68]}

</td></tr></tbody><tfoot></tfoot></table>

Table 9 present in the webpage considered for analysis

Sort ascending	Sort ascending	Sort ascending	Sort ascending	Sort ascending	Sort ascending	Sort ascending	Sort ascending
Currency	Symbol	Founder(s)	Hash function	Programming language of implementation	Consensus mechanism	Notes	
Avalanche							
AVAX		Emin Gün Sirer, Kevin Sekniqi, Maofan “Ted” Yin					
PoS							
Shiba Inu							
SHIB							
Ryoshi							

```

<td>
</td>
<td>
</td>
<td><a href="https://en.wikipedia.org/wiki/Proof_of_stake" title="Proof of stake">PoS</a>
</td>
<td>
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Table 10 present in the webpage considered for analysis

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<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Symbol
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Founder(s)
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending"><a href="https://en.wikipedia.org/wiki/Hash_function" title="Hash function">Hash algorithm</a>
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Programming language of implementation
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Consensus mechanism
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Notes
</th></tr></thead><tbody>
<tr>
<td><a href="https://en.wikipedia.org/wiki/BitClout" title="BitClout">DeSo</a>
</td>
<td>DESO
</td>
<td>Nader al-Naji (<i>aka</i> diamondhands)<sup class="reference" id="cite_ref-:1_71-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-:1-71">[69]</a></sup>
</td>
<td>
</td>
<td><a href="https://en.wikipedia.org/wiki/Go_(programming_language)" title="Go (programming language)">Go</a><sup class="reference" id="cite_ref-72"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-72">[70]</a></sup>
</td>
<td>PoW<sup class="reference" id="cite_ref-:0_73-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-:0-73">[71]</a></sup>
</td>
<td>Also a <a href="https://en.wikipedia.org/wiki/Social_media" title="Social media">social media platform</a>, resembling <a href="https://en.wikipedia.org/wiki/Twitter" title="Twitter">Twitter</a>.<sup class="reference" id="cite_ref-74"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-74">[72]</a></sup><sup class="reference" id="cite_ref-75"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-75">[73]</a></sup> Known as <b>BitClout</b> until September 2021.<sup class="reference" id="cite_ref-:1_71-1"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-:1-71">[69]</a></sup>
</td></tr>

```

```

<tr>
<td><a href="https://en.wikipedia.org/wiki/SafeMoon" title="SafeMoon">SafeMoon</a>
</td>
<td>SAFEMOON
</td>
<td>SafeMoon LLC
</td>
<td>
</td>
<td><a href="https://en.wikipedia.org/wiki/Solidity" title="Solidity">Solidity</a><sup class="reference" id="cite_ref-76"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-76">[74]</a></sup>
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<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Proof-of-work_system" title="Proof-of-work system">PoW</a>
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<tr>
<td><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Internet_Computer" title="Internet Computer">Internet Computer</a>
</td>
<td>ICP
</td>
<td>Dominic Williams, <a class="mw-redirect" href="https://en.wikipedia.org/wiki/DFINITY_Foundation" title="DFINITY Foundation">DFINITY Foundation</a>
</td>
<td>
</td>
<td><a href="https://en.wikipedia.org/wiki/Rust_(programming_language)" title="Rust (programming language)">Rust</a><sup class="reference" id="cite_ref-77"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-77">[75]</a></sup>
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Table 11 present in the webpage considered for analysis

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<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Symbol
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Founder(s)
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending"><a href="https://en.wikipedia.org/wiki/Hash_function" title="Hash function">Hash algorithm</a>
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Programming language of implementation
</th>
<th class="headerSort" role="columnheader button" tabindex="0" title="Sort ascending">Cryptocurrency blockchain <br/><a class="mw-redirect" href="https://en.wikipedi

```

a.org/wiki/Proof-of-stake" title="Proof-of-stake">PoS, PoW, or other)

Notes
2014
Coinye KOI, COYE
Scrypt PoW Used American hip hop artist Kanye West as its mascot, abandoned after he filed a trademark lawsuit.
2015 or before
OneCoin Ruja Ignatova and Stephen Greenwood
A Ponzi scheme promoted as a cryptocurrency.
2017
BitConnect BCC
BitConnect was described as an open source, all-in-one bitcoin and crypto community platform but was later discovered to be a <a 41="" 660="" 967="" 981"="" data-label="Page-Footer" href="https://en.wikipedia.org/wik </td> </tr> </tbody> </table> </div> <div data-bbox=">file:///C:/Users/LENOVO/Downloads/DSC540_Term_Project_Milestone3_Karthikeyan Chellamuthu.html

```

i/Ponzi_scheme" title="Ponzi scheme">Ponzi scheme</a>.
</td></tr>
<tr>
<th rowspan="2">2018
</th>
<td><a href="https://en.wikipedia.org/wiki/KodakCoin" title="KodakCoin">KodakCoin</a>
</td>
<td>
</td>
<td><a href="https://en.wikipedia.org/wiki/Kodak" title="Kodak">Kodak</a> and WENN Digital
</td>
<td>Ethereum<sup class="reference" id="cite_ref-Ray_78-0"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-Ray-78">[76]</a></sup>
</td>
<td>
</td>
<td>
</td>
<td>KodakCoin is a "photographer-centric" blockchain cryptocurrency used for payments for licensing photographs.
</td></tr>
<tr>
<td><a href="https://en.wikipedia.org/wiki/Petro_(cryptocurrency)" title="Petro (cryptocurrency)">Petro</a>
</td>
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</td>
<td><a href="https://en.wikipedia.org/wiki/Cabinet_of_Venezuela" title="Cabinet of Venezuela">Venezuelan Government</a>
</td>
<td>Bitcoin<sup class="reference" id="cite_ref-79"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-79">[77]</a></sup>
</td>
<td><a href="https://en.wikipedia.org/wiki/C%2B2B" title="C++">C++</a><sup class="reference" id="cite_ref-80"><a href="https://en.wikipedia.org/wiki/List_of_cryptocurrencies#cite_note-80">[78]</a></sup>
</td>
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Table 12 present in the webpage considered for analysis

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<li><a href="https://en.wikipedia.org/wiki/Petro_(cryptocurrency)" title="Petro (cry
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<li><a href="https://en.wikipedia.org/wiki/FTX_(company)" title="FTX (company)">FTX
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<li><a href="https://en.wikipedia.org/wiki/Gemini_(company)" title="Gemini (company)">Gemini</a></li>
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<li><a href="https://en.wikipedia.org/wiki/Kraken_(company)" title="Kraken (company)">Kraken</a></li>
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<li><a href="https://en.wikipedia.org/wiki/Hyperledger" title="Hyperledger">Hyperledger</a></li>
<li><a href="https://en.wikipedia.org/wiki/Initial_coin_offering" title="Initial coin offering">Initial coin offering</a></li>
<li><a href="https://en.wikipedia.org/wiki/Initial_exchange_offering" title="Initial exchange offering">Initial exchange offering</a></li>
<li><a class="mw-redirect" href="https://en.wikipedia.org/wiki/Initiative_Q" title="Initiative Q">Initiative Q</a></li>
<li><a class="mw-selflink selflink">List of cryptocurrencies</a></li>
<li><a href="https://en.wikipedia.org/wiki/Token_money" title="Token money">Token money</a></li>
<li><a href="https://en.wikipedia.org/wiki/Virtual_currency" title="Virtual currency">Virtual currency</a></li></ul>
</div></td></tr><tr style="display: none;"><td class="navbox-abovebelow" colspan="2"><div>
<ul><li> <b><a href="https://en.wikipedia.org/wiki/Category:Cryptocurrencies" title="Category:Cryptocurrencies">Category</a></b></li>
<li> <b><a class="extiw" href="https://commons.wikimedia.org/wiki/Category:Cryptocurrency" title="commons:Category:Cryptocurrency">Commons</a></b></li>
<li> <b><a class="mw-selflink selflink">List</a></b></li></ul>
</div></td></tr></tbody></table>

```

In [8]: ''' Computing the length for each table and then to print the content of each table. we could see last three tables are not required for our analysis as it contains diff Hence we have to format the data accordingly to remove the "Release" field from 1st Creating a list of dataframes for all the tables present in the webpage '''

Out[8]: ' Computing the length for each table and then to print the content of each table. As per the previous output,\nwe could see last three tables are not required for our analysis as it contains different data for the initial and final table, we could see "Release Year" is not present as "tr" tag. Instead it is present as "th" tag\nHence we have to format the data accordingly to remove the "Release" field from 1st and last table from the dataset. Here with i am \nCreating a list of dataframes for all the tables present in the webpage '

```

In [9]: # initiate the first table for a given for loop
i = 1

# Declaring a list to store all the df
df_list = []

# create for loop to get the tables present in the webpage

for ntable in range(len(all_tables)-3):
    data_table = soup.findAll("table")[ntable]
    print('\nLength of data_table {} is: {}'.format(i, len(data_table)))
    i = i+1

```

```

header = [th.getText().strip() for th in data_table.findAll('thead')[0].findAll(
if "Release" in header:
    header.remove('Release')
if 'Cryptocurrency blockchain (PoS, PoW, or other)' in header:
    header = ['Consensus mechanism' if x == 'Cryptocurrency blockchain (PoS, PoW
print('Columns/Headers present in the table {}: {}'.format(i, header))

data = data_table.findAll('tr')
data_rows = [[td.get_text().strip() for td in tr.findAll('td')] for tr in data]
print('Data part within First GDP tables are : {}'.format(data_rows))

# Include the additional dataframe for the header and rows extracted from the dataset

# Add the dataframe to the lists

df = pd.DataFrame(data_rows, columns=header)
df.head(3)
df_list.append(df)

# Also dropped the unwanted tables

```

Length of data_table 1 is: 4

Columns/Headers present in the table 2: ['Currency', 'Symbol', 'Founder(s)', 'Hash a
lgorithm', 'Programming language of implementation', 'Consensus mechanism', 'Notes']
Data part within First GDP tables are : [[], ['Bitcoin', 'BTC,[2] XBT, ₿', 'Satoshi
Nakamoto[nt 1]', 'SHA-256d[3][4]', 'C++[5]', 'PoW[4][6]', 'The first and most widely
used decentralized ledger currency,[7] with the highest market capitalization.[8]'],
['Litecoin', 'LTC, Ł', 'Charlie Lee', 'Scrypt', 'C++[9]', 'PoW', 'One of the first c
ryptocurrencies to use scrypt as a hashing algorithm.'], ['Namecoin', 'NMC', 'Vincen
t Durham[10][11]', 'SHA-256d', 'C++[12]', 'PoW', 'Also acts as an alternative, decen
tralized DNS.'], ['Peercoin', 'PPC', 'Sunny King(pseudonym)[citation needed]', 'SHA-
256d[citation needed]', 'C++[13]', 'PoW & PoS', 'The first cryptocurrency to use bot
h PoW and PoS functions.']]

Length of data_table 2 is: 4

Columns/Headers present in the table 3: ['Currency', 'Symbol', 'Founder(s)', 'Hash a
lgorithm', 'Programming language of implementation', 'Consensus mechanism', 'Notes']
Data part within First GDP tables are : [[], ['Dogecoin', 'DOGE, XDG, Ð', 'Jackson P
almer & Billy Markus[14]', 'Scrypt[15]', 'C++[16]', 'PoW', 'Based on the Doge interne
t meme.'], ['Gridcoin', 'GRC', 'Rob Hälford[17]', 'Scrypt', 'C++[18]', 'Decentralize
d PoS', 'Linked to citizen science through the Berkeley Open Infrastructure for Netw
ork Computing[19]'], ['Primecoin', 'XPM', 'Sunny King(pseudonym)[citation needed]',
'1CC/2CC/TWN[20]', 'TypeScript, C++[21]', 'PoW[20]', 'Uses the finding of prime chai
ns composed of Cunningham chains and bi-twin chains for proof-of-work.'], ['Ripple[2
2][23]', 'XRP', 'Chris Larsen & Jed McCaleb[24]', 'ECDSA[25]', 'C++[26]', '"Consensu
s"', 'Designed for peer to peer debt transfer. Not based on bitcoin.'], ['Nxt', 'NX
T', 'BCNext(pseudonym)', 'SHA-256d[27]', 'Java[28]', 'PoS', 'Specifically designed a
s a flexible platform to build applications and financial services around its protoc
ol.']]

Length of data_table 3 is: 4

Columns/Headers present in the table 4: ['Currency', 'Symbol', 'Founder(s)', 'Hash a
lgorithm', 'Programming language of implementation', 'Consensus mechanism', 'Notes']
Data part within First GDP tables are : [[], ['Auroracoin', 'AUR', 'Baldur Odinson
(pseudonym)[29]', 'Scrypt', 'C++[30]', 'PoW', 'Created as an alternative currency fo
r Iceland, intended to replace the Icelandic króna.'], ['Dash', 'DASH', 'Evan Duffie
ld & Kyle Hagan[citation needed]', 'X11', 'C++[31]', 'PoW & Proof of Service[nt 2]',
'A bitcoin-based currency featuring instant transactions, decentralized governance a
nd budgeting, and private transactions.'], ['NEO', 'NEO', 'Da Hongfei & Erik Zhang',
'SHA-256 & RIPEMD160', 'C#[32]', 'dBFT', 'China based cryptocurrency, formerly ANT S
hares and ANT Coins. The names were changed in 2017 to NEO and GAS.'], ['MazaCoin',

'MZC', 'BTC Oyata Initiative', 'SHA-256d', 'C++[33]', 'PoW', 'The underlying software is derived from that of another cryptocurrency, ZetaCoin.'], ['Monero', 'XMR', 'Monero Core Team', 'RandomX', 'C++[34]', 'PoW', 'Privacy-centric coin based on the CryptoNote protocol with improvements for scalability and decentralization.'], ['Bitcoin', 'TIT', 'Edward Mansfield & Richard Allen[35]', 'SHA-256d', 'TypeScript, C++[36]', 'PoW', 'The first cryptocurrency to be nominated for a major adult industry award.[37]'], ['Verge', 'XVG', 'Sunerok', 'Scrypt, x17, groestl, blake2s, and lyra2rev2', 'C, C++[38]', 'PoW', 'Features anonymous transactions using Tor.'], ['Stellar', 'XLM', 'Jed McCaleb', 'Stellar Consensus Protocol (SCP) [39]', 'C, C++[40]', 'Stellar Consensus Protocol (SCP) [39]', 'Open-source, decentralized global financial network.'], ['Vertcoin', 'VTC', 'David Muller[41]', 'Lyra2RE[42]', 'C++[43]', 'PoW', 'Aims to be ASIC resistant.']]

Length of data_table 4 is: 4

Columns/Headers present in the table 5: ['Currency', 'Symbol', 'Founder(s)', 'Hash algorithm', 'Programming language of implementation', 'Consensus mechanism', 'Notes']
Data part within First GDP tables are : [['', ['Ethereum', 'ETH', 'Vitalik Buterin [44]', 'Ethereum', 'ETHash[45]', 'C++, Go[46]', 'PoW, PoS', 'Supports Turing-complete smart contracts.'], ['Ethereum Classic', 'ETC', 'Ethereum Classic', 'Ethereum Classic Hash/Thanos[47]', 'PoW', 'An alternative version of Ethereum[48] whose blockchain does not include the DAO hard fork. [49] Supports Turing-complete smart contracts.'], ['Nano', 'Nano', 'Colin LeMahieu', 'Blake2', 'C++[citation needed]', 'Open Representative Voting[50]', 'Decentralized, feeless, open-source, peer-to-peer cryptocurrency. First to use a Block Lattice structure.'], ['Tether', 'USDT', 'Jan Ludovicus van der Velde[51]', 'Omnicores[52]', 'PoW', 'Tether claims to be backed by USD at a 1 to 1 ratio. The company has been unable to produce promised audits.[53]']]]

Length of data_table 5 is: 4

Columns/Headers present in the table 6: ['Currency', 'Symbol', 'Founder(s)', 'Hash algorithm', 'Programming language of implementation', 'Consensus mechanism', 'Notes']
Data part within First GDP tables are : [['', ['Firo', 'FIR0', 'Poramin Insom[54]', 'Merkle tree Proof[55]', 'C++[56]', 'PoW', 'The first financial system employing Zero-knowledge proof to protect users' privacy.[54] It conducted the world's first large-scale blockchain election for Thailand Democrat Party in 2018.[57]'], ['Zcash', 'ZEC', 'Zooko Wilcox', 'Equihash', 'C++[58]', 'PoW', 'The first open, permissionless financial system employing zero-knowledge security.']]

Length of data_table 6 is: 4

Columns/Headers present in the table 7: ['Currency', 'Symbol', 'Founder(s)', 'Hash algorithm', 'Programming language of implementation', 'Consensus mechanism', 'Notes']
Data part within First GDP tables are : [['', ['Bitcoin Cash', 'BCH[59]', 'SHA-256d', 'PoW', 'Hard fork from bitcoin, increased maximum block size from 1MB to 8MB (as of 2018[update], 32MB)'], ['EOS.IO', 'EOS', 'Dan Larimer', 'WebAssembly, Rust, C, C++[60]', 'delegated PoS', 'Feeless Smart contract platform for decentralized applications and decentralized autonomous corporations with a block time of 500 ms.[60]'], ['Cardano', 'ADA', 'Charles Hoskinson', 'Ouroboros, PoS Algorithm[61]', 'Haskell[62]', 'PoS', 'A proof-of-stake blockchain platform: developed through evidence-based methods and peer-reviewed research.[63][64][65]'], ['TRON', 'TRX', 'Justin Sun', 'Java, Solidity[66]', '']]

Length of data_table 7 is: 4

Columns/Headers present in the table 8: ['Currency', 'Symbol', 'Founder(s)', 'Hash algorithm', 'Programming language of implementation', 'Consensus mechanism', 'Notes']
Data part within First GDP tables are : [['', ['AmbaCoin', 'AmbaCoin', 'AmbaCoin', 'AmbaCoin', 'AmbaCoin', 'AmbaCoin', 'official cryptocurrency of the Cameroonian separatist entity of Ambazonia']]]

Length of data_table 8 is: 4

Columns/Headers present in the table 9: ['Currency', 'Symbol', 'Founder(s)', 'Hash algorithm', 'Programming language of implementation', 'Consensus mechanism', 'Notes']

Data part within First GDP tables are : `[[], ['Algorand', 'ALGO', 'Silvio Micali', '', 'Go[67]', 'PoS', 'Uses a verifiable random function to randomly select groups of users to certify blocks.[68]']]`

Length of data_table 9 is: 4

Columns/Headers present in the table 10: ['Currency', 'Symbol', 'Founder(s)', 'Hash algorithm', 'Programming language of implementation', 'Consensus mechanism', 'Notes']

Data part within First GDP tables are : `[[], ['Avalanche', 'AVAX', 'Emin Gün Sirer, Kevin Sekniqi, Maofan "Ted" Yin', '', '', 'PoS', ''], ['Shiba Inu', 'SHIB', 'Ryoshi', '', '', 'PoS', '']]`

Length of data_table 10 is: 4

Columns/Headers present in the table 11: ['Currency', 'Symbol', 'Founder(s)', 'Hash algorithm', 'Programming language of implementation', 'Consensus mechanism', 'Notes']

Data part within First GDP tables are : `[[], ['DeSo', 'DESO', 'Nader al-Naji (aka di amondhands)[69]', '', 'Go[70]', 'PoW[71]', 'Also a social media platform, resembling Twitter.[72][73] Known as BitClout until September 2021.[69]', ['SafeMoon', 'SAFEMOON', 'SafeMoon LLC', '', 'Solidity[74]', 'PoW', ''], ['Internet Computer', 'ICP', 'Dominic Williams, DFINITY Foundation', '', 'Rust[75]', '']]]`

Length of data_table 11 is: 4

Columns/Headers present in the table 12: ['Currency', 'Symbol', 'Founder(s)', 'Hash algorithm', 'Programming language of implementation', 'Consensus mechanism', 'Notes']

Data part within First GDP tables are : `[[], ['Coinye', 'KOI, COYE', '', 'Script', '', 'PoW', 'Used American hip hop artist Kanye West as its mascot, abandoned after he filed a trademark lawsuit.'], ['OneCoin', '', 'Ruja Ignatova and Stephen Greenwood', '', '', 'A Ponzi scheme promoted as a cryptocurrency.'], ['BitConnect', 'BC C', '', '', 'BitConnect was described as an open source, all-in-one bitcoin and crypto community platform but was later discovered to be a Ponzi scheme.'], ['KodakCoin', '', 'Kodak and WENN Digital', 'Ethash[76]', '', 'KodakCoin is a "photographer-centric" blockchain cryptocurrency used for payments for licensing photographs.'], ['Petro', '', 'Venezuelan Government', 'onixCoin[77]', 'C++[78]', '', 'Stated by Nicolás Maduro to be backed by Venezuela's reserves of oil. As of August 2018 [update] it does not appear to function as a currency.[79]']]`

In [10]: *# Concatenating all the dataframes present in the list*

```
crypto_raw_df = pd.concat(df_list, ignore_index=True)
# Display the header records using head command

crypto_raw_df.head()
```

Out[10]:

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism	Notes
0	None	None	None	None	None	None	None
1	Bitcoin	BTC,[2] XBT, ₿	Satoshi Nakamoto[nt 1]	SHA-256d[3] [4]	C++[5]	PoW[4][6]	The first and most widely used decentralized l...
2	Litecoin	LTC, Ł	Charlie Lee	Script	C++[9]	PoW	One of the first cryptocurrencies to use scryp...

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism	Notes
3	Namecoin	NMC	Vincent Durham[10][11]	SHA-256d	C++[12]	PoW	Also acts as an alternative, decentralized DNS.
4	Peercoin	PPC	Sunny King(pseudonym) [citation needed]	SHA-256d[citation needed]	C++[13]	PoW & PoS	The first cryptocurrency to use both PoW and P...

In [11]: *# Compute the necessary count and metadata for each attributes available in the data*

```

r, c = crypto_raw_df.shape
print("Count of total number of rows present in the dataframe: {}".format(r))
print("Count of total number of columns present in the dataframe: {}".format(c))

```

Count of total number of rows present in the dataframe: 51
Count of total number of columns present in the dataframe: 7

In [12]: *# Display the necessary metadata of given tables*

```

crypto_raw_df.dtypes

```

Out[12]:

Currency	object
Symbol	object
Founder(s)	object
Hash algorithm	object
Programming language of implementation	object
Consensus mechanism	object
Notes	object
dtype:	object

In [13]: *# show the header rows present in the computed dataframe*

```

crypto_raw_df.head()

```

Out[13]:

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism	Notes
0	None	None	None	None	None	None	None
1	Bitcoin	BTC,[2] XBT, ₿	Satoshi Nakamoto[nt 1]	SHA-256d[3] [4]	C++[5]	PoW[4][6]	The first and most widely used decentralized l...
2	Litecoin	LTC, Ł	Charlie Lee	Scrypt	C++[9]	PoW	One of the first cryptocurrencies to use scryp...
3	Namecoin	NMC	Vincent Durham[10][11]	SHA-256d	C++[12]	PoW	Also acts as an alternative, decentralized DNS.

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism	Notes
4	Peercoin	PPC	Sunny King(pseudonym) [citation needed]	SHA-256d[citation needed]	C++[13]	PoW & PoS	The first cryptocurrency to use both PoW and P...

```
In [ ]: '''In milestone 3 we will be cleaning and formatting the website data, using two dif
Step 2: Perform data Cleansing such as cleaning the null rows from the dataset '''
```

Step:2 Data cleansing

```
In [14]: # Compute the total number of null rows present in the dataset

print(" Total number of Null rows present in the dataset: {}".format(crypto_raw_df.C

Total number of Null rows present in the dataset: 11
```

```
In [15]: # Data cleansing aka remove null suing dropna function for a given data set

crypto_raw_df = crypto_raw_df.dropna()
```

```
In [16]: # Just verify the results of the dataframe with few header rows
crypto_raw_df.head()
```

```
Out[16]:
```

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism	Notes
1	Bitcoin	BTC,[2] XBT, ₿	Satoshi Nakamoto[nt 1]	SHA-256d[3] [4]	C++[5]	PoW[4][6]	The first and most widely used decentralized l...
2	Litecoin	LTC, Ł	Charlie Lee	Script	C++[9]	PoW	One of the first cryptocurrencies to use scryp...
3	Namecoin	NMC	Vincent Durham[10][11]	SHA-256d	C++[12]	PoW	Also acts as an alternative, decentralized DNS.
4	Peercoin	PPC	Sunny King(pseudonym) [citation needed]	SHA-256d[citation needed]	C++[13]	PoW & PoS	The first cryptocurrency to use both PoW and P...
6	Dogecoin	DOGE, XDG, Ð	Jackson Palmer & Billy Markus[14]	Script[15]	C++[16]	PoW	Based on the Doge internet meme.

```
In [17]: # We will now reset the index value after dropping null records

crypto_raw_df.reset_index(drop=True, inplace=True)
```


In [18]:

```
# Display the total count of rows and columns after removing null records
```

```
nrow, ncol = crypto_raw_df.shape
print("After cleansing Total number of rows present in the dataframe : {}".format(nrow))
print("After cleansing Total number of columns present in the dataframe: {}".format(ncol))
```

After cleansing Total number of rows present in the dataframe : 40

After cleansing Total number of columns present in the dataframe: 7

In [19]:

```
# display the entire df to perform further analysis
```

```
crypto_raw_df
```

Out[19]:

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism
0	Bitcoin	BTC,[2] XBT, ₿	Satoshi Nakamoto[nt 1]	SHA-256d[3][4]	C++[5]	PoW[4][6]
1	Litecoin	LTC, Ł	Charlie Lee	Scrypt	C++[9]	PoW
2	Namecoin	NMC	Vincent Durham[10][11]	SHA-256d	C++[12]	PoW
3	Peercoin	PPC	Sunny King(pseudonym) [citation needed]	SHA-256d[citation needed]	C++[13]	PoW & PoS
4	Dogecoin	DOGE, XDG, Ð	Jackson Palmer & Billy Markus[14]	Scrypt[15]	C++[16]	PoW
5	Gridcoin	GRC	Rob Hälford[17]	Scrypt	C++[18]	Decentralized PoS
6	Primecoin	XPM	Sunny King(pseudonym) [citation needed]	1CC/2CC/TWN[20]	TypeScript, C++ [21]	PoW[20]
7	Ripple[22][23]	XRP	Chris Larsen & Jed McCaleb[24]	ECDSA[25]	C++[26]	"Consensus"
8	Nxt	NXT	BCNext(pseudonym)	SHA-256d[27]	Java[28]	PoS
9	Auroracoin	AUR	Baldur Odinson(pseudonym) [29]	Scrypt	C++[30]	PoW

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism
10	Dash	DASH	Evan Duffield & Kyle Hagan[citation needed]	X11	C++[31]	PoW & Proof of Service[nt 2]
11	NEO	NEO	Da Hongfei & Erik Zhang	SHA-256 & RIPEMD160	C#[32]	dBFT
12	MazaCoin	MZC	BTC Oyate Initiative	SHA-256d	C++[33]	PoW
13	Monero	XMR	Monero Core Team	RandomX	C++[34]	PoW
14	Titcoin	TIT	Edward Mansfield & Richard Allen[35]	SHA-256d	TypeScript, C++ [36]	PoW
15	Verge	XVG	Sunerok	Script, x17, groestl, blake2s, and lyra2rev2	C, C++[38]	PoW
16	Stellar	XLM	Jed McCaleb	Stellar Consensus Protocol (SCP) [39]	C, C++[40]	Stellar Consensus Protocol (SCP) [39]
17	Vertcoin	VTC	David Muller[41]	Lyra2RE[42]	C++[43]	PoW
18	Ethereum	ETH, ￼	Vitalik Buterin[44]	Ethash[45]	C++, Go[46]	PoW, PoS
19	Ethereum Classic	ETC		EtcHash/Thanos[47]		PoW
20	Nano	Nano	Colin LeMahieu	Blake2	C++[citation needed]	Open Representative Voting[50]
21	Tether	USDT	Jan Ludovicus van der Velde[51]	Omnicores[52]		PoW
22	Firo	FIRO	Poramin Insom[54]	Merkle tree Proof[55]	C++[56]	PoW

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism
23	Zcash	ZEC	Zooko Wilcox	Equihash	C++[58]	PoW
24	Bitcoin Cash	BCH[59]		SHA-256d		PoW
25	EOS.IO	EOS	Dan Larimer		WebAssembly, Rust, C, C++[60]	delegated PoS
26	Cardano	ADA, ₳	Charles Hoskinson	Ouroboros, PoS Algorithm[61]	Haskell[62]	PoS
27	TRON	TRX	Justin Sun		Java, Solidity[66]	
28	AmbaCoin					
29	Algorand	ALGO	Silvio Micali		Go[67]	PoS
30	Avalanche	AVAX	Emin Gün Sirer, Kevin Sekniqi, Maofan “Ted” Yin			PoS
31	Shiba Inu	SHIB	Ryoshi			PoS
32	DeSo	DESO	Nader al-Naji (aka diamondhands)[69]		Go[70]	PoW[71]
33	SafeMoon	SAFEMOON	SafeMoon LLC		Solidity[74]	PoW
34	Internet Computer	ICP	Dominic Williams, DFINITY Foundation		Rust[75]	
35	Coinye	KOI, COYE		Script		PoW
36	OneCoin		Ruja Ignatova and Stephen Greenwood			
37	BitConnect	BCC				

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism
38	KodakCoin		Kodak and WENN Digital	Ethash[76]		
39	Petro		Venezuelan Government	onixCoin[77]	C++[78]	

Step:3 Handling nulls and missing values present in the dataset

In [20]: '''After the further analysis we could see th symbol field present in the dataset is There are some of the records in the dataset with missing value for symbol column. H The digital currency which are having null value for symbol are Ambacoin, Onecoin, k Ambacoin: AMBA, OneCoin: One, KodakCoin: Kodak, Petro: Petro'''

Out[20]: 'After the further analysis we could see th symbol field present in the dataset is m andatory column which will be used to make futher joining with other datasets. \nThe re are some of the records in the dataset with missing value for symbol column. Henc e, we have to populate some values for those records in order to make it as join fie ld with other datasets.\nThe digital currency which are having null value for symbol are Ambacoin, Onecoin, kodakcoin and Petro. With the following symbols will be popul ated for these cryptocurrencies\nAmbacoin: AMBA, OneCoin: One, KodakCoin: Kodak, Pet ro: Petro'

In [21]: *# create a function to pouppulate the digital currency symbols for the missing once*

```
def populate_symbol(row):
    if 'Amba' in row['Currency']:
        return 'AMBA'
    elif 'OneCoin' in row['Currency']:
        return 'ONE'
    elif 'Kodak' in row['Currency']:
        return 'KODAK'
    elif 'Petro' in row['Currency']:
        return 'PETRO'
    else:
        return row['Symbol']
```

In [22]: *# Duplicate the raw dataframe into another dataframe to apply missing/null values*

```
crypto_df = crypto_raw_df.copy()
```

In [23]: *# Add the newly created function to populate_symbol for the missing once and displa*

```
crypto_df['Symbol'] = crypto_df.apply(lambda row: populate_symbol(row), axis=1)
```

In [24]: *# Display few sample values using head commands after adding the the missing valu*

```
crypto_df.head(10)
```

Out[24]:

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism	
0	Bitcoin	BTC,[2] XBT, ₿	Satoshi Nakamoto[nt 1]	SHA-256d[3][4]	C++[5]	PoW[4][6]	T n dece
1	Litecoin	LTC, Ł	Charlie Lee	Script	C++[9]	PoW	One crypt to
2	Namecoin	NMC	Vincent Durham[10] [11]	SHA-256d	C++[12]	PoW	Also de
3	Peercoin	PPC	Sunny King(pseudonym) [citation needed]	SHA-256d[citation needed]	C++[13]	PoW & PoS	crypt 1 P
4	Dogecoin	DOGE, XDG, Ð	Jackson Palmer& Billy Markus[14]	Script[15]	C++[16]	PoW	Ba Do
5	Gridcoin	GRC	Rob Hälford[17]	Script	C++[18]	Decentralized PoS	Linke scien the
6	Primecoin	XPM	Sunny King(pseudonym) [citation needed]	1CC/2CC/TWN[20]	TypeScript, C++ [21]	PoW[20]	Uses of pi cc
7	Ripple[22] [23]	XRP	Chris Larsen &Jed McCaleb[24]	ECDSA[25]	C++[26]	"Consensus"	Di p de
8	Nxt	NXT	BCNext(pseudonym)	SHA-256d[27]	Java[28]	PoS	de flexib
9	Auroracoin	AUR	Baldur Odinsson(pseudonym) [29]	Script	C++[30]	PoW	Cri c

In [25]:

```
# Drop the digitalcurrencies for those has the Symbol values  
crypto_df[(crypto_df.Symbol == 'PETRO') | (crypto_df.Symbol == 'AMBA') | (crypto_df.
```

Out[25]:

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism	Notes
--	----------	--------	------------	----------------	--	---------------------	-------

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism	Notes
28	AmbaCoin	AMBA					official cryptocurrency of the Cameroonian sep...
36	OneCoin	ONE	Ruja Ignatova and Stephen Greenwood				A Ponzi scheme promoted as a cryptocurrency.
38	KodakCoin	KODAK	Kodak and WENN Digital	Ethash[76]			KodakCoin is a "photographer-centric" blockcha...
39	Petro	PETRO	Venezuelan Government	onixCoin[77]	C++[78]		Stated by Nicolás Maduro to be backed by Venez...

Step:4 Include new attributes to the dataset

In [26]: `'''We could see the "release" has been provided as header for all the tables from t`

Out[26]: 'We could see the "release" has been provided as header for all the tables from the website itself. After evaluating the given information present in the website, we can create a function to populate release year field to the dataset'

In [27]: `# Create a function to populate the release year for all the digital currency prese`

```
def release_year(row):
    if "BTC" in row['Symbol']:
        return 2009
    elif 'LTC' in row['Symbol'] or 'NMC' in row['Symbol']:
        return 2011
    elif 'PPC' in row['Symbol']:
        return 2012
    elif 'DOGE' in row['Symbol'] or 'GRC' in row['Symbol'] or 'XPM' in row['Symbol']:
        return 2013
    elif 'AUR' in row['Symbol'] or 'DASH' in row['Symbol'] or 'NEO' in row['Symbol']:
        return 2014
    elif 'ETH' in row['Symbol'] or 'ETC' in row['Symbol'] or 'Nano' in row['Symbol']:
        return 2015
    elif 'FIRO' in row['Symbol'] or 'ZEC' in row['Symbol']:
        return 2016
    elif 'BCH' in row['Symbol'] or 'EOS' in row['Symbol'] or 'ADA' in row['Symbol']:
        return 2017
    elif 'AMBA' in row['Symbol'] or 'PETRO' in row['Symbol'] or 'KODAK' in row['Symbol']:
        return 2018
    elif 'ALGO' in row['Symbol']:
        return 2019
    elif 'AVAX' in row['Symbol'] or 'SHIB' in row['Symbol']:
        return 2020
    elif 'DESO' in row['Symbol'] or 'SAFEMOON' in row['Symbol'] or 'ICP' in row['Symbol']:
        return 2021
```

```
In [29]: # Call the function "release_year" to populate release year for all records.

crypto_df['Release'] = crypto_df.apply(lambda row: release_year(row), axis=1)
```

```
In [30]: # Display the sample records after populating the release year to the dataset

crypto_df.head()
```

Out[30]:

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism	Notes
0	Bitcoin	BTC,[2] XBT, ₿	Satoshi Nakamoto[nt 1]	SHA-256d[3] [4]	C++[5]	PoW[4][6]	The first and most widely used decentralized l...
1	Litecoin	LTC, Ł	Charlie Lee	Scrypt	C++[9]	PoW	One of the first cryptocurrencies to use scryp...
2	Namecoin	NMC	Vincent Durham[10][11]	SHA-256d	C++[12]	PoW	Also acts as an alternative, decentralized DNS.
3	Peercoin	PPC	Sunny King(pseudonym) [citation needed]	SHA-256d[citation needed]	C++[13]	PoW & PoS	The first cryptocurrency to use both PoW and P...
4	Dogecoin	DOGE, XDG, Ð	Jackson Palmer & Billy Markus[14]	Scrypt[15]	C++[16]	PoW	Based on the Doge internet meme.

```
In [31]: # Create a function to verify the if digital currency is active/inactive

def inactive_crypto(row):
    if row['Symbol'] in ('KOI', 'ONE', 'BCC', 'KODAK', 'PETRO'):
        return 'N'
    else:
        return 'Y'
```

```
In [32]: # Adding an active flag to call inactive_crypto function

crypto_df['Active_Flag'] = crypto_df.apply(lambda row: inactive_crypto(row), axis=1)
```

```
In [33]: # display top 10 records from dataframe to veirify it its active flag is populated p

crypto_df.head(10)
```

Out[33]:

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism
--	----------	--------	------------	----------------	--	---------------------

	Currency	Symbol	Founder(s)	Hash algorithm	Programming language of implementation	Consensus mechanism	
0	Bitcoin	BTC,[2] XBT, ₿	Satoshi Nakamoto[nt 1]	SHA-256d[3][4]	C++[5]	PoW[4][6]	T n dece
1	Litecoin	LTC, Ł	Charlie Lee	Scrypt	C++[9]	PoW	One crypt to
2	Namecoin	NMC	Vincent Durham[10] [11]	SHA-256d	C++[12]	PoW	Also de
3	Peercoin	PPC	Sunny King(pseudonym) [citation needed]	SHA-256d[citation needed]	C++[13]	PoW & PoS	crypt i P
4	Dogecoin	DOGE, XDG, Ð	Jackson Palmer& Billy Markus[14]	Scrypt[15]	C++[16]	PoW	Ba Do
5	Gridcoin	GRC	Rob Hälford[17]	Scrypt	C++[18]	Decentralized PoS	Linke scien the
6	Primecoin	XPM	Sunny King(pseudonym) [citation needed]	1CC/2CC/TWN[20]	TypeScript, C++ [21]	PoW[20]	Uses of pi cc
7	Ripple[22] [23]	XRP	Chris Larsen &Jed McCaleb[24]	ECDSA[25]	C++[26]	"Consensus"	Di p de
8	Nxt	NXT	BCNext(pseudonym)	SHA-256d[27]	Java[28]	PoS	de flexib
9	Auroracoin	AUR	Baldur Odinsson(pseudonym) [29]	Scrypt	C++[30]	PoW	Cr c



In [61]:

```
# Considering the above results, we could see a new column "Active_Flag" has been ad  
  
nrow, ncol = crypto_df.shape  
print("Total number of rows present in the dataframe: {}".format(nrow))  
print("Total number of columns present in the dataframe: {}".format(ncol))  
  
Total number of rows present in the dataframe: 40  
Total number of columns present in the dataframe: 10
```

Step 5: Renaming the attributes of header

records

In [34]:

```
# Rename the attributes

crypto_df.rename(columns={'Currency': 'Currency_Name', 'Hash algorithm': 'Hash_Algorithm'})
```

In [35]:

```
# Print sample values to show the rename the columns

crypto_df.head(10)
```

Out[35]:

	Currency_Name	Symbol	Founder(s)	Hash_Algorithm	Implemented_Language	Cons_mech
0	Bitcoin	BTC,[2] XBT, ₿	Satoshi Nakamoto[nt 1]	SHA-256d[3][4]	C++[5]	PoV
1	Litecoin	LTC, Ł	Charlie Lee	Scrypt	C++[9]	
2	Namecoin	NMC	Vincent Durham[10] [11]	SHA-256d	C++[12]	
3	Peercoin	PPC	Sunny King(pseudonym) [citation needed]	SHA-256d[citation needed]	C++[13]	PoW
4	Dogecoin	DOGE, XDG, Ð	Jackson Palmer& Billy Markus[14]	Scrypt[15]	C++[16]	
5	Gridcoin	GRC	Rob Hälford[17]	Scrypt	C++[18]	Decent
6	Primecoin	XPM	Sunny King(pseudonym) [citation needed]	1CC/2CC/TWN[20]	TypeScript, C++[21]	Pc
7	Ripple[22][23]	XRP	Chris Larsen &Jed McCaleb[24]	ECDSA[25]	C++[26]	"Cons
8	Nxt	NXT	BCNext(pseudonym)	SHA-256d[27]	Java[28]	
9	Auroracoin	AUR	Baldur Odinsson(pseudonym) [29]	Scrypt	C++[30]	

Step 6: Reformat the data into readable format

In [37]: `'''There are some unwanted attributes are added to the column values. As a result of In addition we could see symbols for few currencies, We will rename those "Symbol" c`

Out[37]: `'There are some unwanted attributes are added to the column values. As a result of t he data transformation we will remove the anomolies form unwanted number or charact ers from each of the column values.\nIn addition we could see symbols for few curren cies, We will rename those "Symbol" column to "List_of_Symbols" and add another fiel d called "Symbol" to populate the legitimate symbol value to that column.'`

In [36]: `# Rename the "Symbol" column to "List_of_Symbols"`
`crypto_df.rename(columns={'Symbol': 'List_of_Symbols'}, inplace=True)`

In [39]: `# Print the dataset`
`crypto_df.head(10)`

Out[39]:

	Currency_Name	List_of_Symbols	Founder(s)	Hash_Algorithm	Implemented_Language
0	Bitcoin	BTC,[2] XBT, ₿	Satoshi Nakamoto[nt 1]	SHA-256d[3][4]	C++[5]
1	Litecoin	LTC, Ł	Charlie Lee	Scrypt	C++[9]
2	Namecoin	NMC	Vincent Durham[10] [11]	SHA-256d	C++[12]
3	Peercoin	PPC	Sunny King(pseudonym) [citation needed]	SHA-256d[citation needed]	C++[13]
4	Dogecoin	DOGE, XDG, Ð	Jackson Palmer& Billy Markus[14]	Scrypt[15]	C++[16]
5	Gridcoin	GRC	Rob Hälford[17]	Scrypt	C++[18]
6	Primecoin	XPM	Sunny King(pseudonym) [citation needed]	1CC/2CC/TWN[20]	TypeScript, C++[21]
7	Ripple[22][23]	XRP	Chris Larsen & Jed McCaleb[24]	ECDSA[25]	C++[26]

	Currency_Name	List_of_Symbols	Founder(s)	Hash_Algorithm	Implemented_Language
8	Nxt	NXT	BCNext(pseudonym)	SHA-256d[27]	Java[28]

9	Auroracoin	AUR	Baldur Odinsson(pseudonym) [29]	Script	C++[30]
---	------------	-----	---------------------------------------	--------	---------



In [40]: *# Create a function to populate the correct symbol for the digital currency having m*

```
def symbol(row):
    if ',' not in row['List_of_Symbols']:
        return row['List_of_Symbols']
    else:
        if 'BTC' in row['List_of_Symbols']:
            return 'BTC'
        elif 'LTC' in row['List_of_Symbols']:
            return 'LTC'
        elif 'DOGE' in row['List_of_Symbols']:
            return 'DOGE'
        elif 'ETH' in row['List_of_Symbols']:
            return 'ETH'
        elif 'ADA' in row['List_of_Symbols']:
            return 'ADA'
        elif 'KOI' in row['List_of_Symbols']:
            return 'KOI'
```

In [41]: *# calling "symbol" function to populate the symbol of the digital currency*

```
crypto_df['Symbol'] = crypto_df.apply(lambda row: symbol(row), axis=1)
```

In [42]: *# Print the sample records from the dataset using head command.*

```
crypto_df.head(10)
```

Out[42]:

	Currency_Name	List_of_Symbols	Founder(s)	Hash_Algorithm	Implemented_Language
--	---------------	-----------------	------------	----------------	----------------------

0	Bitcoin	BTC,[2] XBT, ₿	Satoshi Nakamoto[nt 1]	SHA-256d[3][4]	C++[5]
1	Litecoin	LTC, Ł	Charlie Lee	Script	C++[9]
2	Namecoin	NMC	Vincent Durham[10] [11]	SHA-256d	C++[12]

	Currency_Name	List_of_Symbols	Founder(s)	Hash_Algorithm	Implemented_Language
3	Peercoin	PPC	Sunny King(pseudonym) [citation needed]	SHA-256d[citation needed]	C++[13]
4	Dogecoin	DOGE, XDG, Ð	Jackson Palmer& Billy Markus[14]	Scrypt[15]	C++[16]
5	Gridcoin	GRC	Rob Hälford[17]	Scrypt	C++[18]
6	Primecoin	XPM	Sunny King(pseudonym) [citation needed]	1CC/2CC/TWN[20]	TypeScript, C++[21]
7	Ripple[22][23]	XRP	Chris Larsen & Jed McCaleb[24]	ECDSA[25]	C++[26]
8	Nxt	NXT	BCNext(pseudonym)	SHA-256d[27]	Java[28]
9	Auroracoin	AUR	Baldur Odinson(pseudonym) [29]	Scrypt	C++[30]

In [43]:

```
# import the Libraries
import re
```

In [44]:

```
# unwanted charecters present in the dataset. So this function to identify unwanted

def unwated_char(row):
    if '[' in row['Currency_Name']:
        return re.sub("[\\(\\[\\.\\*?\\(\\)]]", "", row['Currency_Name'])

    if '[' in row['Founder(s)']:
        return re.sub("[\\(\\[\\.\\*?\\(\\)]]", "", row['Founder(s)'])

    if '[' in row['List_of_Symbols']:
        return re.sub("[\\(\\[\\.\\*?\\(\\)]]", "", row['List_of_Symbols'])

    if '[' in row['Implemented_Language']:
        return re.sub("[\\(\\[\\.\\*?\\(\\)]]", "", row['Implemented_Language'])
```

In [45]:

```
# Remove the charecters given in [] from each of the columns in dataframe
```

```
crypto_df['Currency_Name'] = crypto_df['Currency_Name'].apply(lambda x: re.sub("[\\(\\[\\.\\*?\\(\\)]]", "", x))
crypto_df['Founder(s)'] = crypto_df['Founder(s)'].apply(lambda x: re.sub("[\\(\\[\\.\\*?\\(\\)]]", "", x))
```

```
crypto_df['List_of_Symbols'] = crypto_df['List_of_Symbols'].apply(lambda x: re.sub("
crypto_df['Implemented_Language'] = crypto_df['Implemented_Language'].apply(lambda x
crypto_df['Hash_Algorithm'] = crypto_df['Hash_Algorithm'].apply(lambda x: re.sub("\
crypto_df['Consensus mechanism'] = crypto_df['Consensus mechanism'].apply(lambda x:
```

In [48]:

```
# Display the records available in the dataframe after cleaning up unwanted characte

crypto_df.head(10)
```

Out[48]:

	Currency_Name	List_of_Symbols	Founder(s)	Hash_Algorithm	Implemented_Language	Consens mechanis
0	Bitcoin	BTC, XBT, ₿	Satoshi Nakamoto	SHA-256d	C++	Po
1	Litecoin	LTC, Ł	Charlie Lee	Scrypt	C++	Po
2	Namecoin	NMC	Vincent Durham	SHA-256d	C++	Po
3	Peercoin	PPC	Sunny King	SHA-256d	C++	PoW & P
4	Dogecoin	DOGE, XDG, Ð	Jackson Palmer& Billy Markus	Scrypt	C++	Po
5	Gridcoin	GRC	Rob Hälford	Scrypt	C++	Decentraliz p
6	Primecoin	XPM	Sunny King	1CC/2CC/TWN	TypeScript, C++	Po
7	Ripple	XRP	Chris Larsen & Jed McCaleb	ECDSA	C++	"Consensu
8	Nxt	NXT	BCNext	SHA-256d	Java	P
9	Auroracoin	AUR	Baldur Odinsson	Scrypt	C++	Po



In [49]:

```
'''Now that we can conclude the unwated characters from the above resulsts ([12],[1
```

Out[49]: 'Now that we can conclude the unwanted characters from the above results ([12],[13]) are removed from all the columns of the dataframe'

Step 7: Remove duplicates from the dataset

In [50]: *# Verify if there are any duplicate values within the dataframe, at a row level*

```
duplicate_df = crypto_df[crypto_df.duplicated()]
```

In [51]: *# capture the duplicate into a duplicate dataframe to check if there is any duplicate*

```
duplicate_df
```

Out[51]:

Currency_Name	List_of_Symbols	Founder(s)	Hash_Algorithm	Implemented_Language	Consensus mechanism
---------------	-----------------	------------	----------------	----------------------	---------------------



In [39]: *## Calculating the size of dataframe after duplicates*

```
crypto_df.shape
```

Out[39]: (40, 9)

In []: *'''We can conclude that there is no duplicates present in the dataframe. The shape r*

Step 8: Data visualization representation of a digital currency by release year

In [52]: *# Plot a graph between the number of digitalcurrency released per year calculate the*

```
crypto_cnt_year_df = crypto_df[['Release_Year', 'Currency_Name']].groupby("Release_Year")
crypto_cnt_year_df
```

Out[52]:

	Release_Year	Currency_Name
0	2009	1
1	2011	2
2	2012	1
3	2013	5
4	2014	10
5	2015	5
6	2016	2
7	2017	5
8	2018	3
9	2019	1

	Release_Year	Currency_Name
10	2020	2
11	2021	3

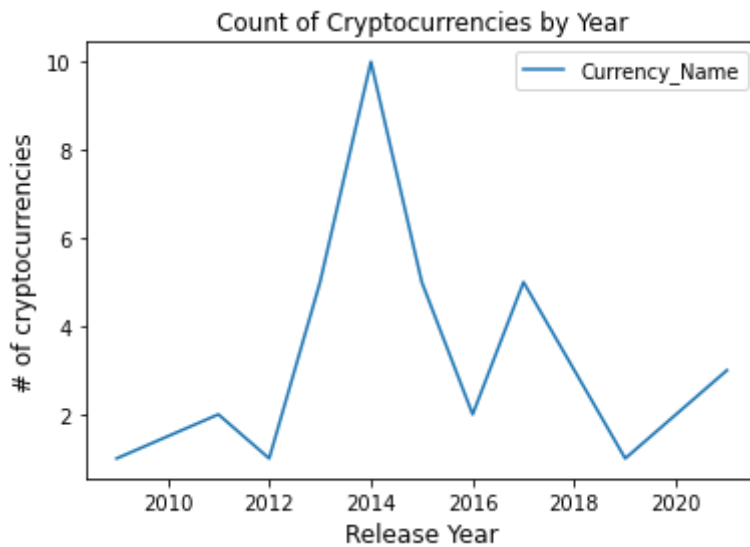
In [53]:

```
# Show the graphs plot results

df = pd.DataFrame(crypto_cnt_year_df, columns=['Release_Year', 'Currency_Name'])
df.plot(x='Release_Year', y='Currency_Name', kind='line')
plt.title('Count of Cryptocurrencies by Year')

plt.xlabel('Release Year', fontsize=12)
plt.ylabel('# of cryptocurrencies', fontsize=12)

plt.show()
```



Step 9: Capture the final output to comma seperated values files

In [54]:

```
# store the last dataframe to csv file which can be used to make join with other dat
crypto_df.to_csv("Crypto_Currencies_Metadata.csv", index=False)
```

In [55]:

```
#display the final digital currency stored in a csv file.
crypto_df.head(10)
```

Out[55]:

	Currency_Name	List_of_Symbols	Founder(s)	Hash_Algorithm	Implemented_Language	Consens mechanis
0	Bitcoin	BTC, XBT, ₿	Satoshi Nakamoto	SHA-256d	C++	Po
1	Litecoin	LTC, Ł	Charlie Lee	Script	C++	Po

	Currency_Name	List_of_Symbols	Founder(s)	Hash_Algorithm	Implemented_Language	Consens mechanis
2	Namecoin	NMC	Vincent Durham	SHA-256d	C++	Po
3	Peercoin	PPC	Sunny King	SHA-256d	C++	PoW & P
4	Dogecoin	DOGE, XDG, Ð	Jackson Palmer & Billy Markus	Scrypt	C++	Po
5	Gridcoin	GRC	Rob Hälford	Scrypt	C++	Decentraliz p
6	Primecoin	XPM	Sunny King	1CC/2CC/TWN	TypeScript, C++	Po
7	Ripple	XRP	Chris Larsen & Jed McCaleb	ECDSA	C++	"Consensu
8	Nxt	NXT	BCNext	SHA-256d	Java	P
9	Auroracoin	AUR	Baldur Odinsson	Scrypt	C++	Po