**Python for Finance – Project**

**Case 2 – Financial topic chosen by the student**

The aim of this project was to see the evolution of a financial portfolio over time according to the investment method. For example, I wanted to see how much my portfolio would have grown if I had invested a total of €4900 in Bitcoin since January 1, 2020.

There are 2 main methods when it comes to investing, whether in crypto-currencies or equities: either you buy for X amount all at once, or you buy little by little on a regular basis.

So I wanted to see what the difference would be between investing €4900 all at once on January 1, 2020 and investing €100 a month from January 1, 2020 to January 1, 2024.

For simplicity's sake, I didn't take into account inflation, which may have altered the value of the euro over time.

To do this, I first created a relatively simple Excel with each date on which I bought €100 worth of Bitcoin, and for each date, the value of the Bitcoin at the close of the day. The data was harvested from Yahoo Finance and the exact price is BTC/USD.

I then implemented this Excel on Pycharm in my project to check that I could open it correctly.

The aim of this code was to visualize portfolio fluctuations over time. So, in black you can see the Bitcoin price, in red the one-off investment of 4900€ and in blue the monthly investment of 100€.

As you can see from the graph, we would have earned much more if we had made a one-off investment of 4900€ on January 1, 2020, as opposed to the other scenario.

However, it's a well-known fact that investing a large amount all at once, rather than splitting it up over a longer period, is always riskier.

Here is the code used on Pycharm:

import pandas as pd  
import matplotlib.pyplot as plt  
  
def calculate\_portfolio\_growth(initial\_investment, monthly\_investment, bitcoin\_values):  
 portfolio\_values = [initial\_investment]  
 cumulative\_investment = initial\_investment  
 for i in range(1, len(bitcoin\_values)):  
 monthly\_return = bitcoin\_values[i] / bitcoin\_values[i - 1] # Calcul de la variation du Bitcoin par rapport au mois précédent  
 portfolio\_value = (portfolio\_values[-1] + 100) \* monthly\_return # Calcul de la valeur du portefeuille  
 portfolio\_values.append(portfolio\_value)  
 cumulative\_investment += monthly\_investment # Ajout de l'investissement mensuel cumulatif  
 return portfolio\_values  
  
def calculate\_single\_investment(initial\_investment, bitcoin\_values):  
 portfolio\_values = [initial\_investment]  
 for i in range(1, len(bitcoin\_values)):  
 portfolio\_value = portfolio\_values[-1] \* (bitcoin\_values[i] / bitcoin\_values[i - 1])  
 portfolio\_values.append(portfolio\_value)  
 return portfolio\_values  
  
def main():  
 # Charger les données depuis Excel  
 df = pd.read\_excel('BTC\_Investment.xlsx')  
  
 # Filtrer les données à partir du 1er janvier 2020  
 df = df[df['Date'] >= '2020-01-01']  
  
 # Scénario 1 : Investissement mensuel de 100€ à partir du 1er janvier 2020  
 scenario1\_values = calculate\_portfolio\_growth(0, 100, df['BTC\_Value'])  
  
 # Scénario 2 : Investissement unique de 4900€ le 1er janvier 2020  
 scenario2\_values = calculate\_single\_investment(4900, df['BTC\_Value'])  
  
 # Tracé du graphique  
 plt.plot(df['Date'], df['BTC\_Value'], label='Données brutes du Bitcoin', color='black')  
 plt.plot(df['Date'], scenario1\_values, label='Investissement mensuel de 100€', color='blue')  
 plt.plot(df['Date'], scenario2\_values, label='Investissement unique de 4900€', color='red')  
  
 plt.title('Comparaison des scénarios d\'investissement Bitcoin')  
 plt.xlabel('Date')  
 plt.ylabel('Valeur du portefeuille (en euros)')  
 plt.legend()  
 plt.grid(True)  
 plt.show()  
  
if \_\_name\_\_ == "\_\_main\_\_":  
 main()

Here is the graph provided by the code:

Une image contenant Tracé, texte, ligne, diagramme

Description générée automatiquement