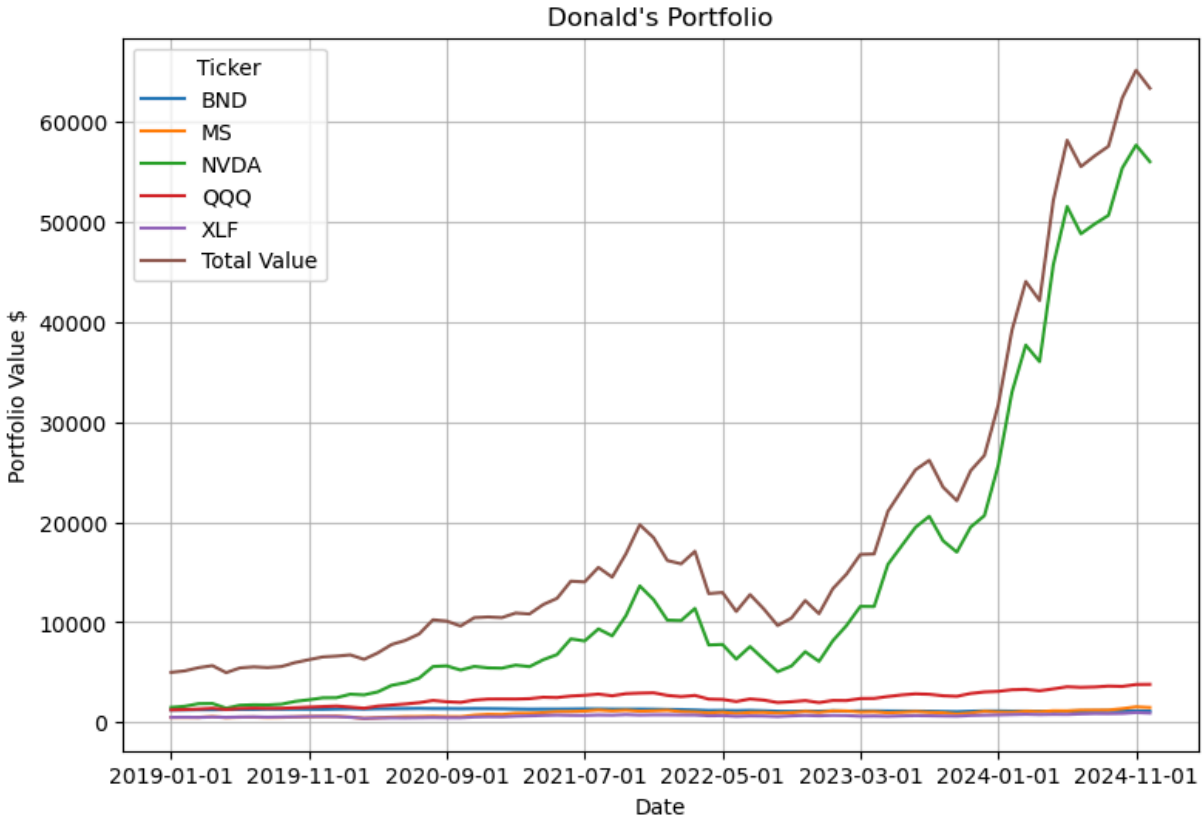
In [52]:
```
import pandas as pd
import yfinance as yf
import numpy as np
import matplotlib.pyplot as plt
from IPython.display import display, Math, Latex
```

In [48]:
```
# Play around the model -> Personal Preference:
# Stocks Selected:
personal_stocks = ["NVDA","BND","MS","XLF","QQQ"]
starting = "2019-01-01"
ending = "2024-12-02"
personal_data = yf.download(personal_stocks, start = starting, end = ending,
personal_data.index = personal_data.index.strftime("%Y-%m-%d")
personal_data
initial_investment = 5000
# Weighting based on Personal Preference:
weights_per_stock = np.array([25,10,30,25,10]) / 100
invest_per_stock = weights_per_stock * initial_investment
my_portfolio = personal_data / personal_data.iloc[0] * invest_per_stock
my_portfolio["Total Value"] = my_portfolio.sum(axis=1)
plt.figure(figsize=(9,6))
plt.title("Donald's Portfolio")
plt.ylabel("Portfolio Value $")
my_portfolio.plot(ax=plt.gca())
plt.grid(alpha = 0.8)
```

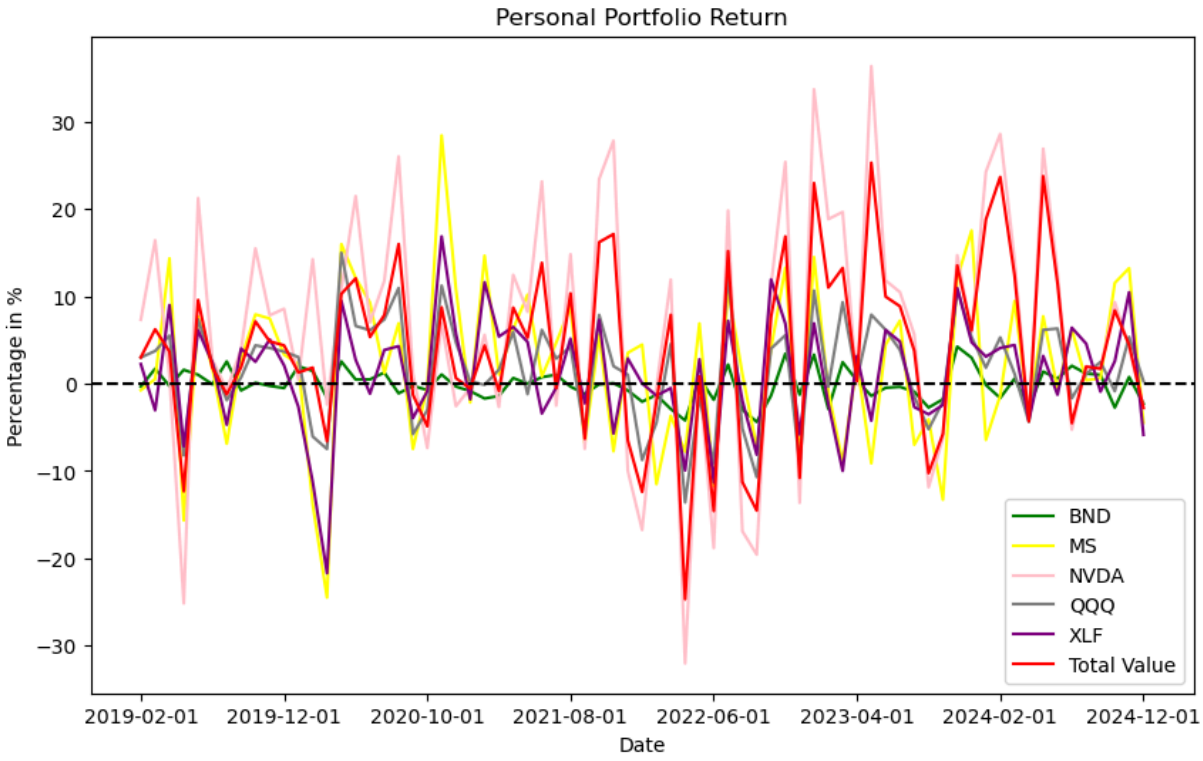
```
[**********************100%**************************]  5 of 5 completed
```



In [49]:
```
portfolio_return = my_portfolio.pct_change()
portfolio_return = portfolio_return.drop(portfolio_return.index[0])
portfolio_return *=100
plt.figure(figsize=(10,6))
colour = ["green", "yellow", "pink", "grey", "purple"]
i = 0
for col in portfolio_return.columns:
    if col != "Total Value":
        portfolio_return[col].plot(ax=plt.gca(), color = colour[i], label =
        i+=1
    else:
        portfolio_return[col].plot(ax=plt.gca(), label = col, color = 'red')

plt.axhline(y=0, color = 'black', linestyle= '--')
plt.title("Personal Portfolio Return")
plt.ylabel("Percentage in %")
plt.legend()
```

Out[49]:
```
<matplotlib.legend.Legend at 0x15e27f250>
```




In [50]:
```
print("Mean: ")
print(portfolio_return.mean())
print()

print("Volatility: ")
print(portfolio_return.std())
```

```
Mean:
Ticker
BND          -0.135742
MS            1.962570
NVDA          6.184767
QQQ           1.752380
XLF           1.088624
Total Value   4.127230
dtype: float64

Volatility:
Ticker
BND            1.793630
MS             9.196478
NVDA          14.005964
QQQ            5.941207
XLF            6.433102
Total Value    9.992059
dtype: float64
```

Note:

- The effects of diversification is clearly demonstrated in my personal portfolio, it brings down the volatility of the portfolio but also improves the expected return. Here are some remarks I took into consideration while forming this:
- The risk of a portfolio depends on how the securities in it move in relation to each other. Remarks: - Nvidia acted as a good hedge agains the shortfall in XLF and MS. i.e around 2020, - The XLF and MS also heged the downfall of Nvidia, i.e around 2022. => personal conclusion, they complement each otehr.
- Statistics wise: - an expected return of 4.12% and volatility of 9.99%. - The performance clearly beats a single stock. -> lowers risk and improves return.

- Nvidia High-growth tech, provides high return and very volatile.
- Vanguard Total Bond BND, provides stability & downturn hedge
- Financial Sector SPDR Fund XLF, provides a wider financial exposure
- Tech Sector, QQQ Trust QQQ, Growth from Nasdaq-100, ensuring tech exposure
- Generating a healthy monthly return, while reducing the risk.
- Nvidia is indeed a good stock hahaha.