Recession Analysis

A recession is a period of significant economic decline, typically defined by two consecutive quarters where the flow of money within the economy slows down. This lack of consumer spending directly impacts businesses; as their revenues drop, they may be forced to cut costs, leading to job losses and a broader economic slowdown. This chain of events likely contributes to the layoffs that have become a concern.

To analyze and understand the patterns of a recession, economists and analysts turn to several key indicators. These include Gross Domestic Product (GDP) growth, which measures the overall output of a country's economy, the unemployment rate, which tracks the percentage of the workforce without jobs, and consumer spending, which reveals how much people are purchasing goods and services. While all of these factors are important, analyzing the changes in monthly GDP growth remains the most widely used method for pinpointing and measuring a recession.

Recession Analysis using Python

```python
import pandas as pd
import plotly.graph_objs as go
import plotly.express as px
import plotly.io as pio
pio.templates.default = "plotly_white"

data = pd.read_csv('UK_monthly_gdp.csv')

print(data.head())
```

```
     Time Period  GDP Growth
  0     /01/2020         0.3
  1     /02/2020        -0.5
  2     /03/2020        -7.0
  3     /04/2020       -20.9
  4     /05/2020         3.2
```

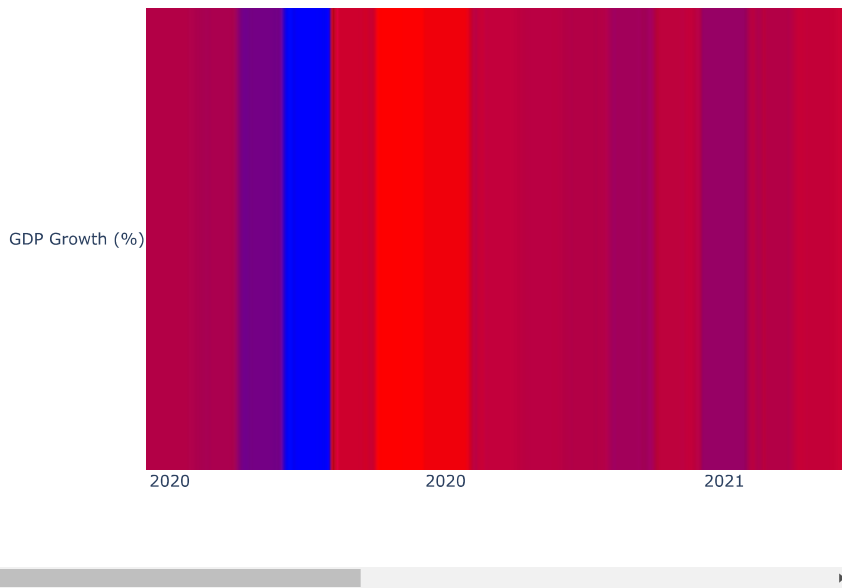Let's have a look at the GDP growth over time:

```python
import pandas as pd
import plotly.graph_objects as go


fig = go.Figure(data=go.Heatmap(
        z=[data['GDP Growth'].values],
        x=data.index,
        y=['GDP Growth (%)'],
        colorscale='Bluered'))

fig.update_layout(title='GDP Growth over Time',
        xaxis_title='Time Period',
        yaxis_title='',
        xaxis=dict(tickformat='%Y')
)

fig.show()
```

GDP Growth over Time

As a recession means the decline in the circulation of money for two consecutive quarters, I will convert our monthly data into quarterly data to analyze the recession:

```
# Convert monthly data to quarterly data using resample method
data['Time Period'] = pd.to_datetime(data['Time Period'], format='/%m/%Y')
data.set_index('Time Period', inplace=True)
quarterly_data = data.resample('Q').mean()
print(quarterly_data.head())

              GDP Growth
    Time Period
    2020-03-31    -2.400000
    2020-06-30    -2.900000
    2020-09-30     3.500000
    2020-12-31     0.200000
    2021-03-31     0.033333
```

Now here's how we can calculate and analyze recession based on quarterly GDP growth:

```
# Calculate recession based on quarterly GDP growth
quarterly_data['Recession'] = ((quarterly_data['GDP Growth'] < 0) & (quarterly_data['GDP Growth'].shift(1) < 0))

# Fill missing values with False (since the first quarter cannot be in a recession)
quarterly_data['Recession'].fillna(False, inplace=True)

# Plot the GDP growth and recession data
fig = go.Figure()
fig.add_trace(go.Scatter(x=quarterly_data.index,
                         y=quarterly_data['GDP Growth'],
                         name='GDP Growth',
                         line=dict(color='blue', width=2)))
fig.add_trace(go.Scatter(x=quarterly_data[quarterly_data['Recession']].index,
                         y=quarterly_data[quarterly_data['Recession']]['GDP Growth'],
                         name='Recession', line=dict(color='orange', width=2)))

fig.update_layout(title='GDP Growth and Recession over Time (Quarterly Data)',
                  xaxis_title='Time Period',
                  yaxis_title='GDP Growth')

fig.show()
```
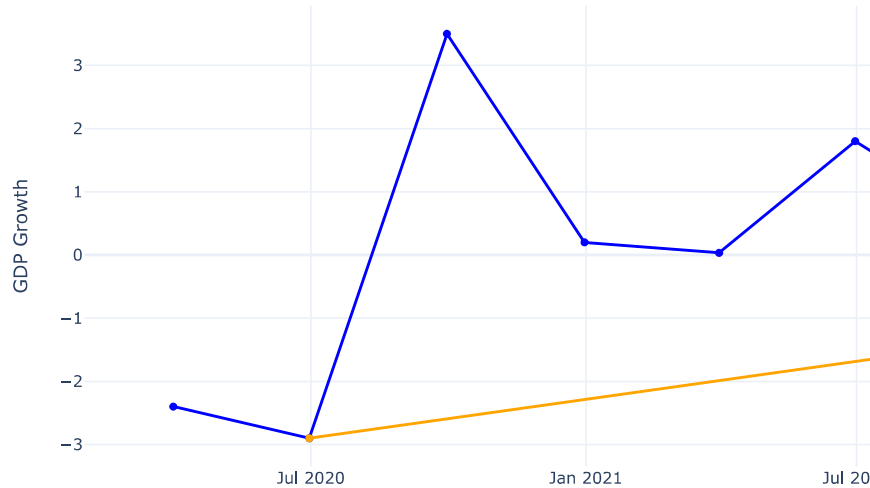
GDP Growth and Recession over Time (Quarterly Data)

The orange line shows the periods of negative GDP growth (considered recessions), and the blue line shows the overall trend in GDP growth over time.

Let us now analyze the severity of the recession. The severity of a recession refers to the extent to which the economy contracts during a recession. A severe recession involves a deeper and more prolonged decline in economic activity, resulting in negative effects on employment, incomes and other economic indicators. Here's how to analyze the severity of the recession:

```
quarterly_data['Recession Start'] = quarterly_data['Recession'].ne(quarterly_data['Recession'].shift()).cumsum()
recession_periods = quarterly_data.groupby('Recession Start')
recession_duration = recession_periods.size()
recession_severity = recession_periods['GDP Growth'].sum()

fig = go.Figure()
fig.add_trace(go.Bar(x=recession_duration.index, y=recession_duration,
                     name='Recession Duration'))
fig.add_trace(go.Bar(x=recession_severity.index, y=recession_severity,
                     name='Recession Severity'))

fig.update_layout(title='Duration and Severity of Recession',
                  xaxis_title='Recession Periods',
                  yaxis_title='Duration/Severity')

fig.show()
```

Duration and Severity of Recession