In finance, returns measure the amount of profit or loss one has gained by investing in an asset, such as stocks or government bonds. Using logarithmized returns $r\_t$ allows to aggregate returns over periods as the product collapses to a sum.

\*\*Mathematical definition:\*\*

\newline

\begin{align\*} R\_t &= \frac{P\_t - P\_{t-1}}{P\_{t-1}} = \frac{P\_t}{P\_{t-1}} - 1 \\ \Rightarrow R\_{i, j} &= \prod\_{t=i \geq 1}^{j}{(1+R\_t)} = \prod\_{t=i \geq 1}^{j}{\left(\frac{P\_t}{P\_{t-1}}\right)} \\ \ln(R\_{i, j}) &= \sum\_{t=i \geq 1}^{j}{\underbrace{\ln\left(\frac{P\_t}{P\_{t-1}}\right)}\_{\overset{\rotatebox{90}{:=}}{r\_t}}} \end{align\*}

Where $R\_t$ and $P\_t$ are respectively the return on an asset and its price at time $t$, and $R\_{i, j}$ is the return on an asset in the period between $i, \dots, j$.