Introduction to Interest

Definition:

Interest is the amount charged or earned for the use of money over time.

It is typically expressed as a percentage of the principal amount and is calculated based on the time period for which the money is borrowed or invested.

Simple Interest

Formula:

Simple interest is calculated using the formula:
$$\text{Simple Interest} = P \times r \times t$$
Simple Interest=P×r×t

where: P is the principal amount (initial amount borrowed or invested), r is the interest rate per period (expressed as a decimal), t is the time period (in years).

Calculation:

To calculate the total amount (principal plus interest) accrued over a certain period, the formula is:
$$\text{Total Amount} = P + \text{Simple Interest}$$
Total Amount=P+Simple Interest

Compound Interest

Formula:

Compound interest is calculated using the formula: $A = P \times (1 + \frac{r}{n})^{nt}$ A=P×(1+ nr) nt

where: A is the total amount (principal plus interest) accrued, P is the principal amount, r is the annual interest rate (as a decimal), n is the number of times interest is compounded per year t is the time period (in years).

Calculation:

Compound interest takes into account the interest earned on both the initial principal and any accumulated interest from previous periods.

Difference Between Simple Interest and Compound Interest

The main difference between simple interest and compound interest is how interest is calculated:

Simple interest is calculated only on the principal amount, while
Compound interest is calculated on both the principal and any previously earned interest.

Applications
1. Banking and Finance:

Simple and compound interest are fundamental concepts in banking and finance, used in loans, investments, mortgages, and savings accounts.

2. Investments:

Understanding simple and compound interest is crucial for making informed investment decisions and maximizing returns on investments.