**Coin problems** form a prominent sub-category of simultaneous linear systems. These scenarios test your ability to distinguish between two distinct characteristics of a collection: the **quantity (count)** of the items and the **monetary value** of the items.

To construct a valid mathematical model for coin scenarios, you must assign a fixed valuation weight to each distinct unit placeholder:

- **1 Dime** = 10 cents or $0.10
- **1 Quarter** = 25 cents or $0.25
- **1 Dollar** = 100 cents or $1.00

**Note:** When setting up your value equation, all terms must be measured in the **same unit**. You can either write the entire equation in terms of total dollars (using decimals) or total cents (using whole integers). Mixing dollars and cents in a single equation will lead to an incorrect result.

Let's break down the problem parameters:

- Total number of coins = 28
- Total monetary value = $3.85 (which equals 285)

**<u>Step 1:</u> Define the Variable System**

Let x represent the number of dimes, and let y represent the number of quarters.

- **Quantity Equation:** The total count of coins is 28:

$$x + y = 28$$

- **Value Equation (in Cents):** The sum of the values of each coin type equals 385 cents:

$$10x + 25y = 385$$

**<u>Step 2:</u> Isolate an Independent Variable**

To find the number of quarters (y) directly, isolate the dimes variable (x) in our quantity equation:

$$x = 28 - y$$

**<u>Step 3:</u> Substitute into the Value Equation**

Replace x in the value equation with the expression $(28 - y)$:

$$10(28 - y) + 25y = 385$$

**Step 4: Expand and Solve for y**

$$y = \frac{105}{15} = 7\ quarters$$