COMPUTER PROGRAMMING DATA TYPES

Let's discuss about a very simple but very important concept available in almost all the programming languages which is called **data types**. As its name indicates, a data type represents a type of the data which you can process using your computer program. It can be numeric, alphanumeric, decimal, etc.

Apart from Computer Programming, let's take a nursery class problem to add two whole numbers 10 & 20, which we can do simply as follows:

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10 + 20
```

Let's take another problem where we want to add two decimal numbers 10.50 & 20.50, which will be written as follows:

```
10.50 + 20.50
```

Above two examples are straight forward now let's take one example where we want to record student information in a notebook. Here is following important information, which we can record:

- Name:

- Class:

- Section:

- Age:

- Sex:

Now, let's put one student record as per the given requirement:

- Name: Zara Ali

- Class: 6th

- Section: J

- Age: 13

- Sex: F

First example dealt whole numbers and second example added two numbers with decimals where as third example is dealing with a mix of different data. Let's put it as follows:

- Student name "Zara Ali" is a sequence of characters which is also called a string.

- Student class "6th" has been represented by a mix of whole number and a string of two characters. Such a mix is called alphanumeric.

- Student section has been represented by single character which is 'J'.

- Student age has been represented by whole number which is 13.

- Student sex has been represented by a single character which is 'F'.

This way we realized that in our day-2-day life we deal with different types of data like strings, characters, whole numbers which is also called integers, decimal numbers which is also called floating point numbers.

Similar way when we write our computer program to process different types of data, we need to specify its type clearly otherwise computer does not understand how different operations can be performed on that given data. Different programming languages use different keywords to specify different data types. For example C and Java programming languages use **int** to specify integer data whereas **char** specifies a character data type.

Subsequent chapters will show you how to use different data types in different situations. For now let's check what are the important data types available in C, Java and Python programming languages and what are the keywords we will use to specify those data types.

C & Java Data Types

Programming languages C and Java support almost same set of data types, though Java supports additional data types. For now, we are taking few common data types supported by both the programming languages:

Type	Keyword	Value range which can be represented by this data type
Character	char	-128 to 127 or 0 to 255
Number	int	-32,768 to 32,767 or -2,147,483,648 to 2,147,483,647
Small Number	short	-32,768 to 32,767
Long Number	long	-2,147,483,648 to 2,147,483,647
Decimal Number	float	1.2E-38 to 3.4E+38 till 6 decimal places

These data types are called primitive data types and you can use these data types to build more complex data types, which are called user-defined data type, for example a string will be a sequence of characters.

Python Data Types

Python has five standard data types but this programming language does not make use of any keyword to specify a particular data type rather Python is intelligent enough to understand given data type automatically.

- Numbers
- String
- List
- Tuple

- Dictionary

Here, Number specifies all types of numbers including decimal numbers and string represents a sequence of characters with a length of 1 or more characters. For now, let's proceed with these two data types and skip List, Tuple and Dictionary, which are advanced data types in Python.