UNIT-I

What is PHP

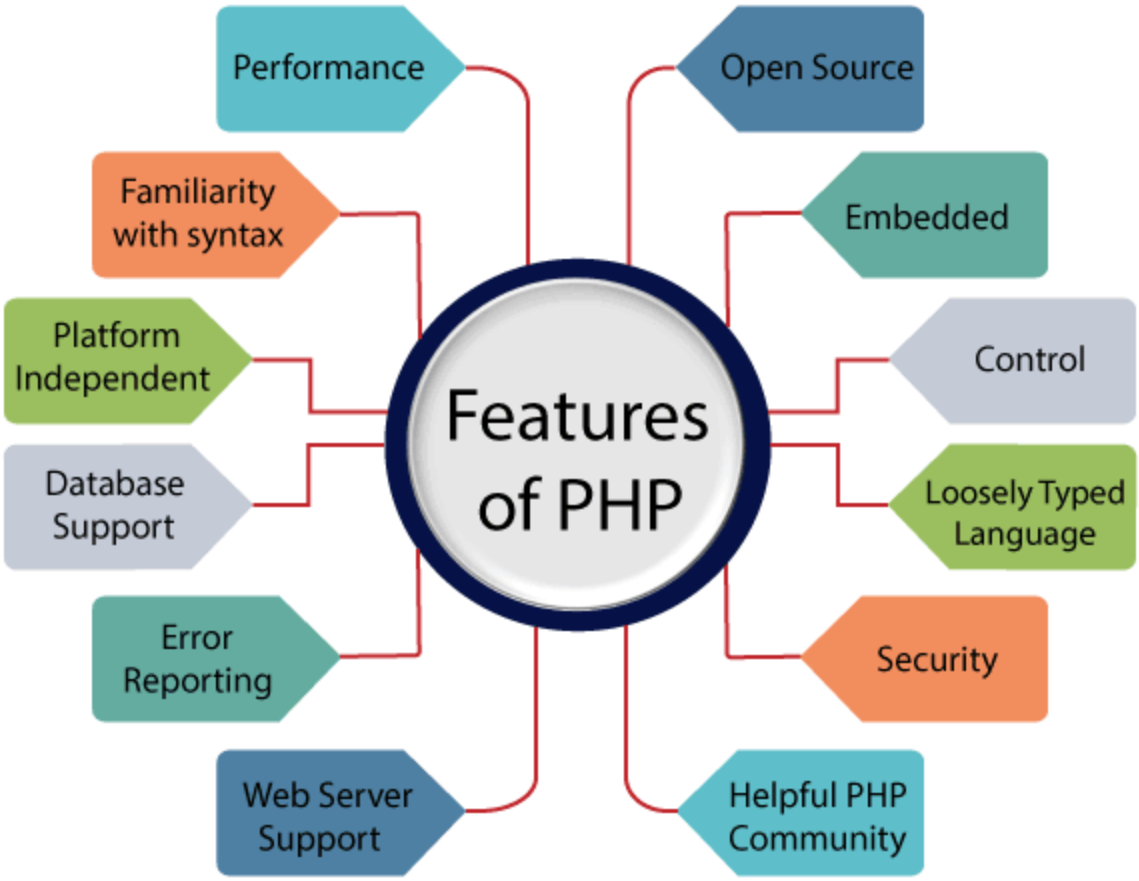
PHP is an open-source, interpreted, and object-oriented scripting language that can be executed at the server-side. PHP is well suited for web development. Therefore, it is used to develop web applications (an application that executes on the server and generates the dynamic page.).

PHP was created by **Rasmus Lerdorf in 1994** but appeared in the market in 1995. **PHP 7.4.0** is the latest version of PHP, which was released on **28 November**. Some important points need to be noticed about PHP are as followed:

- PHP stands for Hypertext Preprocessor.
- PHP is an interpreted language, i.e., there is no need for compilation.
- PHP is faster than other scripting languages, for example, ASP and JSP.
- PHP is a server-side scripting language, which is used to manage the dynamic content of the website.
- PHP can be embedded into HTML.
- PHP is an object-oriented language.
- PHP is an open-source scripting language.
- PHP is simple and easy to learn language.

PHP Features

PHP is very popular language because of its simplicity and open source. There are some important features of PHP given below:



Performance:

- PHP script is executed much faster than those scripts which are written in other languages such as JSP and ASP. PHP uses its own memory, so the server workload and loading time is automatically reduced, which results in faster processing speed and better performance.

Open Source:

- PHP source code and software are freely available on the web. You can develop all the versions of PHP according to your requirement without paying any cost. All its components are free to download and use.

Familiarity with syntax:

- PHP has easily understandable syntax. Programmers are comfortable coding with it.

Embedded:

- PHP code can be easily embedded within HTML tags and script.

Platform Independent:

- PHP is available for WINDOWS, MAC, LINUX & UNIX operating system. A PHP application developed in one OS can be easily executed in other OS also.

Database Support:

- PHP supports all the leading databases such as MySQL, SQLite, ODBC, etc.

Error Reporting -

- PHP has predefined error reporting constants to generate an error notice or warning at runtime. E.g., E_ERROR, E_WARNING, E_STRICT, E_PARSE.

Loosely Typed Language:

- PHP allows us to use a variable without declaring its datatype. It will be taken automatically at the time of execution based on the type of data it contains on its value.

Web servers Support:

- PHP is compatible with almost all local servers used today like Apache, Netscape, Microsoft IIS, etc.

Security:

- PHP is a secure language to develop the website. It consists of multiple layers of security to prevent threads and malicious attacks.

Control:

- Different programming languages require long script or code, whereas PHP can do the same work in a few lines of code. It has maximum control over the websites like you can make changes easily whenever you want.

A Helpful PHP Community:

- It has a large community of developers who regularly updates documentation, tutorials, online help, and FAQs. Learning PHP from the communities is one of the significant benefits.

Basic Development of PHP:

All PHP code goes between the php tag. It starts with <?php and ends with ?>. The syntax of PHP tag is given below:

```
<?php
//your code here
?>
```

PHP echo and print Statements

We frequently use the echo statement to display the output. There are two basic ways to get the output in PHP:

- echo
- print

echo and print are language constructs, and they never behave like a function. Therefore, there is no requirement for parentheses. However, both the statements can be used with or without parentheses. We can use these statements to output variables or strings.

Difference between echo and print

echo

- echo is a statement, which is used to display the output.
- echo can be used with or without parentheses.
- echo does not return any value.
- We can pass multiple strings separated by comma (,) in echo.
- echo is faster than print statement.

print

- print is also a statement, used as an alternative to echo at many times to display the output.
- print can be used with or without parentheses.
- print always returns an integer value, which is 1.
- Using print, we cannot pass multiple arguments.
- print is slower than echo statement.

PHP Variables

In PHP, a variable is declared using a **$ sign** followed by the variable name. Here, some important points to know about variables:

- As PHP is a loosely typed language, so we do not need to declare the data types of the variables. It automatically analyzes the values and makes conversions to its correct datatype.
- After declaring a variable, it can be reused throughout the code.
- Assignment Operator (=) is used to assign the value to a variable.

Syntax of declaring a variable in PHP is given below:

```
$variablename=value;
```

Rules for declaring PHP variable:

- A variable must start with a dollar ($) sign, followed by the variable name.
- It can only contain alpha-numeric character and underscore (A-z, 0-9, _).
- A variable name must start with a letter or underscore (_) character.
- A PHP variable name cannot contain spaces.
- One thing to be kept in mind that the variable name cannot start with a number or special symbols.
- PHP variables are case-sensitive, so $name and $NAME both are treated as different variable.

PHP Variable: Declaring string, integer, and float

Let's see the example to store string, integer, and float values in PHP variables.

File: variable1.php

```
<?php
$str="hello string";
$x=200;
$y=44.6;
echo "string is: $str <br/>";
echo "integer is: $x <br/>";
```

```
echo "float is: $y <br/>";
?>
```

Output:

```
string is: hello string
integer is: 200
float is: 44.6
```

PHP Operators

PHP Operator is a symbol i.e used to perform operations on operands. In simple words, operators are used to perform operations on variables or values. For example:

```
$num=10+20;//+ is the operator and 10,20 are operands
```

In the above example, + is the binary + operator, 10 and 20 are operands and $num is variable.

PHP Operators can be categorized in following forms:

- Arithmetic Operators
- Assignment Operators
- Bitwise Operators
- Comparison Operators
- Incrementing/Decrementing Operators
- Logical Operators
- String Operators
- Array Operators
- Type Operators
- Execution Operators
- Error Control Operators

Arithmetic Operators

- The PHP arithmetic operators are used to perform common arithmetic operations such as addition, subtraction, etc. with numeric values.

Operator	Name	Example	Explanation
+	Addition	$a + $b	Sum of operands
-	Subtraction	$a - $b	Difference of operands
*	Multiplication	$a * $b	Product of operands
/	Division	$a / $b	Quotient of operands
%	Modulus	$a % $b	Remainder of operands
**	Exponentiation	$a ** $b	$a raised to the power $b

Assignment Operators

The assignment operators are used to assign value to different variables. The basic assignment operator is "=".

Operator	Name	Example	Explanation
=	Assign	$a = $b	The value of right operand is assigned to the left ope
+=	Add then Assign	$a += $b	Addition same as $a = $a + $b
-=	Subtract then Assign	$a -= $b	Subtraction same as $a = $a - $b
*=	Multiply then Assign	$a *= $b	Multiplication same as $a = $a * $b
/=	Divide then Assign (quotient)	$a /= $b	Find quotient same as $a = $a / $b
%=	Divide then Assign (remainder)	$a %= $b	Find remainder same as $a = $a % $b

Bitwise Operators

The bitwise operators are used to perform bit-level operations on operands. These operators allow the evaluation and manipulation of specific bits within the integer.

Operator	Name	Example	Explanation
&	And	$a & $b	Bits that are 1 in both $a and $b are set to 1, ot
|	Or (Inclusive or)	$a | $b	Bits that are 1 in either $a or $b are set to 1
^	Xor (Exclusive or)	$a ^ $b	Bits that are 1 in either $a or $b are set to 0.
~	Not	~$a	Bits that are 1 set to 0 and bits that are 0 are se
<<	Shift left	$a << $b	Left shift the bits of operand $a $b steps
>>	Shift right	$a >> $b	Right shift the bits of $a operand by $b number

---

Comparison Operators

Comparison operators allow comparing two values, such as number or string. Below the list of comparison operators are given:

Operator	Name	Example	Explanation
==	Equal	$a == $b	Return TRUE if $a is equal to $b
===	Identical	$a === $b	Return TRUE if $a is equal to $b, and they are of same da
!==	Not	$a !== $b	Return TRUE if $a is not equal to $b, and they are not of

	identical		
!=	Not equal	$a != $b	Return TRUE if $a is not equal to $b
<>	Not equal	$a <> $b	Return TRUE if $a is not equal to $b
<	Less than	$a < $b	Return TRUE if $a is less than $b
>	Greater than	$a > $b	Return TRUE if $a is greater than $b
<=	Less than or equal to	$a <= $b	Return TRUE if $a is less than or equal $b
>=	Greater than or equal to	$a >= $b	Return TRUE if $a is greater than or equal $b
<=>	Spaceship	$a <=>$b	Return -1 if $a is less than $b Return 0 if $a is equal $b Return 1 if $a is greater than $b

Incrementing/Decrementing Operators

The increment and decrement operators are used to increase and decrease the value of a variable.

Operator	Name	Example	Explanation
++	Increment	++$a	Increment the value of $a by one, then return $a

		$a++	Return $a, then increment the value of $a by one
--	decrement	--$a	Decrement the value of $a by one, then return $a
		$a--	Return $a, then decrement the value of $a by one

Logical Operators

The logical operators are used to perform bit-level operations on operands. These operators allow the evaluation and manipulation of specific bits within the integer.

Operator	Name	Example	Explanation
and	And	$a and $b	Return TRUE if both $a and $b are true
Or	Or	$a or $b	Return TRUE if either $a or $b is true
xor	Xor	$a xor $b	Return TRUE if either $ or $b is true but not both
!	Not	! $a	Return TRUE if $a is not true
&&	And	$a && $b	Return TRUE if either $a and $b are true
||	Or	$a || $b	Return TRUE if either $a or $b is true

String Operators

The string operators are used to perform the operation on strings. There are two string operators in PHP, which are given below:

Operator	Name	Example	Explanation
.	Concatenation	$a . $b	Concatenate both $a and $b
.=	Concatenation and Assignment	$a .= $b	First concatenate $a and $b, then assign the co to $a, e.g. $a = $a . $b

Array Operators

The array operators are used in case of array. Basically, these operators are used to compare the values of arrays.

Operator	Name	Example	Explanation
+	Union	$a + $y	Union of $a and $b
==	Equality	$a == $b	Return TRUE if $a and $b have same key/value pair
!=	Inequality	$a != $b	Return TRUE if $a is not equal to $b
===	Identity	$a === $b	Return TRUE if $a and $b have same key/value pair of san order
!==	Non-Identity	$a !== $b	Return TRUE if $a is not identical to $b
<>	Inequality	$a <> $b	Return TRUE if $a is not equal to $b

Type Operators

The type operator **instanceof** is used to determine whether an object, its parent and its derived class are the same type or not. Basically, this operator determines which certain class the object belongs to. It is used in object-oriented programming.

```
<?php
   //class declaration
   class Developer
   {}
   class Programmer
   {}
   //creating an object of type Developer
   $charu = new Developer();

   //testing the type of object
   if( $charu instanceof Developer)
   {
      echo "Charu is a developer.";
   }
   else
   {
      echo "Charu is a programmer.";
   }
   echo "</br>";
   var_dump($charu instanceof Developer);          //It will return true.
   var_dump($charu instanceof Programmer);       //It will return false.
?>
```

Output:

```
Charu is a developer.
bool(true) bool(false)
```

Execution Operators

PHP has an execution operator **backticks (``)**. PHP executes the content of backticks as a shell command. Execution operator and **shell_exec()** give the same result.

Operator	Name	Example	Explanation
``	backticks	echo `dir`;	Execute the shell command and return the result. Here, it will show the directories available in current f

Note: Note that backticks (``) are not single-quotes.

Error Control Operators

PHP has one error control operator, i.e., **at (@) symbol**. Whenever it is used with an expression, any error message will be ignored that might be generated by that expression.

Operator	Name	Example	Explanation
@	at	@file ('non_existent_file')	Intentional file error

PHP Operators Precedence

Let's see the precedence of PHP operators with associativity.

Operators	Additional Information	Associativity
clone new	clone and new	non-associative
[	array()	left

**	arithmetic	right
++ -- ~ (int) (float) (string) (array) (object) (bool) @	increment/decrement and types	right
instanceof	types	non-associative
!	logical (negation)	right
* / %	arithmetic	left
+ - .	arithmetic and string concatenation	left
<< >>	bitwise (shift)	left
< <= > >=	comparison	non-associative
== != === !== <>	comparison	non-associative
&	bitwise AND	left
^	bitwise XOR	left
|	bitwise OR	left
&&	logical AND	left

||	logical OR	left
?:	ternary	left
= += -= *= **= /= .= %= &= |= ^= <<= >>= =>	assignment	right
and	logical	left
xor	logical	left
or	logical	left
,	many uses (comma)	left

PHP Data Types

PHP data types are used to hold different types of data or values. PHP supports 8 primitive data types that can be categorized further in 3 types:

1. Scalar Types (predefined)
2. Compound Types (user-defined)
3. Special Types

PHP Data Types: Scalar Types

It holds only single value. There are 4 scalar data types in PHP.

1. boolean
2. integer
3. float

4. string

PHP Data Types: Compound Types

1. array
2. object

PHP Data Types: Special Types

There are 2 special data types in PHP.

1. resource
2. NULL

PHP Boolean

Booleans are the simplest data type works like switch. It holds only two values: **TRUE (1)** or **FALSE (0)**. It is often used with conditional statements. If the condition is correct, it returns TRUE otherwise FALSE.

Example:

```
<?php
   if (TRUE)
      echo "This condition is TRUE.";
   if (FALSE)
     echo "This condition is FALSE.";
?>
```

Output:

```
This condition is TRUE.
```

PHP Integer

Integer means numeric data with a negative or positive sign. It holds only whole numbers, i.e., numbers without fractional part or decimal points.

Rules for integer:

- An integer can be either positive or negative.

- An integer must not contain decimal point.
- Integer can be decimal (base 10), octal (base 8), or hexadecimal (base 16).
- The range of an integer must be lie between 2,147,483,648 and 2,147,483,647 i.e., -2^31 to 2^31.

Example:

```
<?php
   $dec1 = 34;
   $oct1 = 0243;
   $hexa1 = 0x45;
   echo "Decimal number: " .$dec1. "</br>";
   echo "Octal number: " .$oct1. "</br>";
   echo "HexaDecimal number: " .$hexa1. "</br>";
?>
```

Output:

```
Decimal number: 34
Octal number: 163
HexaDecimal number: 69
```

PHP Float

A floating-point number is a number with a decimal point. Unlike integer, it can hold numbers with a fractional or decimal point, including a negative or positive sign.

Example:

```
<?php
   $n1 = 19.34;
   $n2 = 54.472;
   $sum = $n1 + $n2;
   echo "Addition of floating numbers: " .$sum;
?>
```

Output:

```
Addition of floating numbers: 73.812
```

PHP String

A string is a non-numeric data type. It holds letters or any alphabets, numbers, and even special characters.

String values must be enclosed either within **single quotes** or in **double quotes**. But both are treated differently. To clarify this, see the example below:

Example:

```
<?php
   $company = "Javatpoint";
   //both single and double quote statements will treat different
   echo "Hello $company";
   echo "</br>";
   echo 'Hello $company';
?>
```

Output:

```
Hello Javatpoint
Hello $company
```

PHP Array

An array is a compound data type. It can store multiple values of same data type in a single variable.

Example:

```
<?php
   $bikes = array ("Royal Enfield", "Yamaha", "KTM");
   var_dump($bikes);   //the var_dump() function returns the datatype and values
   echo "</br>";
   echo "Array Element1: $bikes[0] </br>";
   echo "Array Element2: $bikes[1] </br>";
   echo "Array Element3: $bikes[2] </br>";
?>
```

Output:

```
array(3) { [0]=> string(13) "Royal Enfield" [1]=> string(6) "Yamaha" [2]=> string(3) "KTM" }
```

```
Array Element1: Royal Enfield
Array Element2: Yamaha
Array Element3: KTM
```

You will learn more about array in later chapters of this tutorial.

PHP object

Objects are the instances of user-defined classes that can store both values and functions. They must be explicitly declared.

Example:

```
<?php
    class bike {
        function model() {
            $model_name = "Royal Enfield";
            echo "Bike Model: " .$model_name;
          }
    }
    $obj = new bike();
    $obj -> model();
?>
```

Output:

```
Bike Model: Royal Enfield
```

This is an advanced topic of PHP, which we will discuss later in detail.

PHP Resource

Resources are not the exact data type in PHP. Basically, these are used to store some function calls or references to external PHP resources. **For example** - a database call. It is an external resource.

This is an advanced topic of PHP, so we will discuss it later in detail with examples.

PHP Null

Null is a special data type that has only one value: **NULL**. There is a convention of writing it in capital letters as it is case sensitive.

The special type of data type NULL defined a variable with no value.

Example:

```
<?php
   $nl = NULL;
   echo $nl;   //it will not give any output
?>
```

Output:

PHP Constants

PHP constants are name or identifier that can't be changed during the execution of the script except for magic constants, which are not really constants. PHP constants can be defined by 2 ways:

1. Using define() function
2. Using const keyword

Constants are similar to the variable except once they defined, they can never be undefined or changed. They remain constant across the entire program. PHP constants follow the same PHP variable rules. **For example**, it can be started with a letter or underscore only.

Conventionally, PHP constants should be defined in uppercase letters.

PHP constant: define()

Use the define() function to create a constant. It defines constant at run time. Let's see the syntax of define() function in PHP.

define(name, value, **case**-insensitive)

1. **name:** It specifies the constant name.
2. **value:** It specifies the constant value.

3. **case-insensitive:** Specifies whether a constant is case-insensitive. Default value is false. It means it is case sensitive by default.

Let's see the example to define PHP constant using define().

File: constant1.php

```
<?php
define("MESSAGE","Hello JavaTpoint PHP");
echo MESSAGE;
?>
```

Output:

```
Hello JavaTpoint PHP
```