PHP String Concatenation Notes

1. Introduction to Concatenation:
- Concatenation is the process of joining two or more strings together.
- In PHP, the concatenation operator is represented by a dot (.).
- This operator combines strings and variables into one single string.

Example:
```php
<?php
 $first = "Hello";
 $second = "World";
 echo $first . " " . $second; // Output: Hello World
?>
```

2. Concatenation Operator (.)
- The dot operator is used to join strings.
- Multiple concatenations can be done in a single statement.

Example:
```php
<?php
 $a = "PHP";
 $b = "is";
 $c = "awesome!";
  echo $a . " " . $b . " " . $c;
// Output: PHP is awesome!
?>
```

Notes:
- Always remember to include spaces if required, as PHP will not add them automatically.

3. Concatenation Assignment Operator (.=)
- The .= operator appends a string to an existing variable.
- It is a shorthand way to combine strings without rewriting the variable.

Example:
```php
<?php
 $msg = "Learning";
 $msg .= " PHP";
 $msg .= " Concatenation";
 echo $msg;
// Output: Learning PHP Concatenation
?>
```

Notes:
- This method is useful when building strings in loops or conditional statements.

4. Concatenation with Variables and Strings
- Variables can be combined with string literals.
- Both single and double quotes can be used.

Example with Variables:
```php
<?php
 $name = "Sakshi";
 $course = "BCA";
 echo "Hello, " . $name . "! You are studying " . $course;
?>
```

Example with Single Quotes:
```php
<?php
 $city = "Pune";
 echo 'I live in ' . $city;
?>
```

Notes:
- Double quotes allow variable interpolation, but concatenation works in both single and double quotes.

5. Practical Examples:
a) Full Name Generator:

```php
<?php
  $firstName = "Sakshi";
  $lastName = "Patil";
  $fullName = $firstName . " " . $lastName;
  echo "Full Name: " . $fullName;
?>
```

b) Building Sentences in Loop:

```php
<?php
  $sentence = "";
  for($i=1; $i<=3; $i++) {
    $sentence .= "Line " . $i . " ";
  }
  echo $sentence;
// Output: Line 1 Line 2 Line 3
?>
```

Summary:
- Concatenation in PHP is done using the . operator.
- Use .= for appending strings to existing variables.
- Always manage spaces manually while concatenating.
- Useful for generating dynamic messages, reports, and formatted output.