

**PRESIDENCY UNIVERSITY**

**BANGALORE**

**Assignment Phase 1**

Of

**PRINCIPAL OF PROGRAMMING LANGUAGES**

By

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**The introduction to the programming language chosen**

**PHP**

The PHP Hypertext Preprocessor (PHP) is a programming language that allows the web developer to create dynamic content that can interacts with databases which have been connected to the WebPages. PHP is basically used for developing a web based software applications which can be used for our requirements. PHP performs system functions that are from files on a system which can be created, opened, readied, written, and close the respective files. PHP can handle forms that are to gather the data from files, save data to a file and through email you can send data, and also returns data to the user. We can add, delete, and modify elements within our database through PHP. Access cookies variables and set cookies. Using PHP, we can restrict users to access some pages of our website. It can encrypt data. There are five important characteristics make PHP's practical nature possible that is Simplicity, Efficiency, Security, Flexibility, Familiarity.

**C# (C – sharp)**

C# is a modern, general-purpose, object-oriented programming language developed by Microsoft and approved by European Computer Manufacturers Association **(ECMA)** and International Standards Organization **(ISO).** C# was developed by Anders Hejlsberg and his team during the development of Net Framework. C# is designed for Common Language Infrastructure **(CLI),** which consists of the executable code and runtime environment that allows use of various high-level languages on different computer platforms and architectures. The reasons that makes C# a widely used professional language that are, it is a modern, general-purpose, object oriented language. It is component oriented, it is easy to learn, it is a structured language, it produces efficient programs, it can be compiled on a variety of computer platforms, and it is a part of .Net Framework. Although C# constructs closely follow traditional high-level languages, C and C++ and being an object-oriented programming language. It has strong resemblance with Java; it has numerous strong programming features that make it endearing to a number of programmers worldwide. Following is the list of few important features of C#: Boolean Conditions, Automatic Garbage Collection, Standard Library, Assembly Versioning, Properties and Events, Delegates and Events Management, Easy-to-use Generics, Conditional Compilation, Simple Multithreading, LINQ and Lambda Expressions, Integration with Windows

**Python**

Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently whereas the other languages use punctuations. It has fewer syntactical constructions than other languages. This language is similar to PERL and PHP. Python is Interactive. Python is Object-Oriented. Python was developed by Guido van Rossum in the late eighties and early nineties at the National Research Institute for Mathematics and Computer Science in the Netherlands. Python is derived from many other languages, including ABC, Modula-3, C, C++, Algol-68, Smalltalk, and UNIX shell and other scripting languages. Python has a big list of good features. A few of them are, It supports functional and structured programming methods as well as OOP. It can be used as a scripting language or can be compiled to byte-code for building large applications. It provides very high-level dynamic data types and supports dynamic type checking. It supports automatic garbage collection. It can be easily integrated with C, C++, COM, ActiveX, CORBA, and Java.

**The data types**

**PHP**

The data types in PHP are

1. Strings
2. Integer
3. Float/ double
4. Boolean
5. Array
6. Object
7. Null
8. Resource

**C# (C – sharp)**

The data types in C – Sharp are

1. Boolean
2. Integer
3. Strings
4. Character
5. Float/double

**Python**

Python has five standard data types-

1. Numbers
2. String
3. List
4. Tuple
5. Dictionary

**PHP**

**Strings**

A string is a sequence of characters, like "Hello world!”. A string can be any text inside quotes. We can use single or double quotes to the represent a string of character to be executed or displayed after the execution of program.

**Integer**

An integer data type is a non-decimal number between -2,147,483,648 and 2,147,483,647 to be the accurate. There are some rules for integers in PHP language. There are, an integer must have at least one digit, an integer must not have a decimal point, an integer can be either positive or negative, integers can be specified in three formats there are decimal (10-based), hexadecimal (16-based - prefixed with 0x) or octal (8-based - prefixed with 0).

**Float/ Double**

A float (floating point number) is a number with a decimal point or a number in exponential form.

**Boolean**

A Boolean represents two possible states: TRUE or FALSE.

$x = true;

$y = false;

Booleans are often used in conditional testing.

**Array**

An array stores multiple values in one single variable. It is stored in the form of sequence of data entered by the user or programmer

**Object**

An object is a data type which stores data and information on how to process that data. In PHP, an object must be explicitly declared. First we must declare a class of object. For this, we use the class keyword. A class is a structure that can contain properties and methods of the program:

**NULL Value**

Null is a special data type which can have only one value: NULL. A variable of data type NULL is a variable that has no value assigned to it. It is automatically assigned a value of NULL. Variables can also be emptied by setting the value to NULL.

**C – Sharp**

**Boolean:**

In C – Sharp, Boolean data type gives the output whether it is true or false same as PHP or Python.

**Integer:**

In C – Sharp, integer are the data type that does not have a decimal point in the number example: 919, 569, etc

**Floating:**

In C – Sharp, floating data type are the number which have a decimal point in the number with 7 digits of precision. example: 919.113, 103.856, etc

**Decimal:**

In C – Sharp, decimal data type are the number which has a decimal point in the number with total of 128 bits. It has 29 precision points. Example: 103.333, 987.399, etc

**String:**

In C – Sharp, string are the set of character which is declared inside double inverted quotes or single inverted quotes. Example: “Presidency University”,” music”.

**Python**

**Numbers**

Number data types are the data type that stores a numeric value. Number objects are created when we assign a value to the data type with a variable. Python supports three different numerical types. There are, Integer (signed integers), float (floating point real values), and complex (complex numbers)

For example: integer – 428643, float – 143.569, complex – 236+658i

**String**

Strings in Python are identified as a contiguous set of characters represented in the quotation marks. Python allows either pair of single or double quotes. Subsets of strings can be taken using the slice operator ([ ] and [:] ) with indexes starting at 0 in the beginning of the string and working their way from -1 to the end.

For example: “all the best”, “study will”

**List**

Lists are the most versatile of Python's compound data types. A list contains items separated by commas and enclosed within square brackets ([]). To some extent, lists are similar to arrays in C. One of the differences between them is that all the items belonging to a list can be of different data type. The values stored in a list can be accessed using the slice operator ([ ] and [:]) with indexes starting at 0 in the beginning of the list and working their way to end -1. The plus (+) sign is the list concatenation operator, and the asterisk (\*) is the repetition operator.

For example: list = [‘meghas’, 786, 2.23, 'john', 70.2]

**Tuple**

A Tuple is another sequence data type that is similar to the list. A Tuple consists of a number of values separated by commas. Unlike lists, however, tuples are enclosed within parenthesis. The main difference between lists and tuples is- Lists are enclosed in brackets ([ ]) and their elements and size can be changed, while tuples are enclosed in parentheses (( )) and cannot be updated. Tuples can be thought of as read-only lists.

For example: Tuple = (‘Calvin’, 786, 2.23, 'john', 70.2)

**Dictionary**

Python's dictionaries are kind of hash-table type. They work like associative arrays or hashes found in Perl and consist of key-value pairs. A dictionary key can be almost any Python type, but are usually numbers or strings. Values, on the other hand, can be any arbitrary Python object. Dictionaries are enclosed by curly braces ({ }) and values can be assigned and accessed using square braces ([]).

For example: dict ['one'] = "This is one"

**Comparisons of all the language with respect to data types**

All the three languages have the same meaning with respect to all the meaning of Readability, writability, reliability hence all the languages are same in these terms.

|  |  |  |  |
| --- | --- | --- | --- |
| **Data types** | **PHP** | **C – Sharp** | **Python** |
| Strings | A string is a sequence of characters; A string can be any text inside quotes.  Example: “Presidency University ” | | |
| Integer | Integers are the number which does not have decimal point in the given number  Example: 789123 | | |
| Float /double | Float / double are the number which have a decimal point in the given number  Example: 456.369 | | |
| Boolean | Boolean are the data type which returns the value which is **true** or **false** | | |
| Array | Array are the data type which stores the value in form of list  Example: [cat, dogs, cow, donkey] | | |

**Variables**

**PHP**

A variable can have a short name (like x and y) or a more descriptive name (age, carname, total\_volume) which resemble the data stored in the data memory location. The variable are starting with the $ sign, followed by the name of the variable. A variable name in PHP starts with a letter or the underscore character. A variable name should not start with a number. A variable name will have only contain alpha-numeric characters and underscores (A-z, 0-9, and \_) Variable names are case-sensitive ($age and $AGE are two different variables). A variable in PHP have all data types assigned to it as a default data type.

Example: $a (integer), $b (character), etc.

**C – Sharp**

A variable is nothing but a name given to a storage area that our programs can manipulate. Each variable in C# has a specific type, which determines the size and layout of the variable's memory, the range of values that can be stored within that memory, and the set of operations that can be applied to the variable. C# also allows defining other value types of variable such as enum and reference types of variables such as class

**Syntax for variable definition in C# is:**

<data\_type> <variable\_list>;

Here, data type must be a valid C# data type including char, int, float, double, or any user-defined data type, and variable list may consist of one or more identifier names separated by commas.

Some valid variable definitions for example are:

Int i, j, k;

Char c, ch;

Float f, salary;

**Python**

Variables are nothing but reserved memory locations to store values. It means that when you create a variable, you reserve some space in the memory. Based on the data type of a variable, the interpreter allocates memory and decides what can be stored in the reserved memory. Therefore, by assigning different data types to the variables, you can store integers, decimals or characters in these variables.

Example: A = 985 (type is integer)

C = 65.98 (type is float/double)

D = “music” (type is strings)

**Comparisons of all the language with respect to variables**

When comparing all the three languages with respect to variables, we can arrive to the following result in the following criteria.

|  |  |  |  |
| --- | --- | --- | --- |
| **Criteria** | **PHP** | **C – Sharp** | **Python** |
| Readability | PHP use $ symbol for variable declaration hence it is comparatively **medium** | C – Sharp is similar to C and C++ hence its comparatively **low** | The variable are declared as such without any datatype to mention hence it is comparatively **high** |
| Writability | It is comparatively **high** since we use a symbol to declare a variable | It is comparatively **medium** because we declare with datatype in front of the variables | It is comparatively **Low** because we just declare the variable with its variable name and with its values |
| Reliability | All the three programming languages are reliable in all the executing platforms which runs our desired program in all the time of execution of it | | |

Constants

Conditional statements

Loops

Jump statement