CS330: Programming Language Project (PLP)

Assignment 4: Control flow

Due: October 6th

Now that you know about the data types in your programming language, it's time to start actually using them. Find out how the following control statements are written in your language, and write an example of each. If your language doesn't support these control statements specifically, try to find a way to emulate the behavior:

a one-condition if/else statement (i.e. "if x == true")

a multi-condition if/else statement (i.e. "if x>0 && y< 10)

different kinds of loops: while, do/while, for, foreach

a switch-case statement

break and continue statements

For your write-up, answer the following questions:

1. What types of conditional statements are available in your language? (if/else, if/then/else, if/elseif/else). Does allow for statements other than “if” (for example, Perl has an “unless” statement, which does the opposite of “if”!)

PHP have if/else and if/elseif/else . No, it does not allow for statements other than if.

2. Does your language use short-circuit evaluation? If so, make sure that your code includes an example.

It does use short-circuit evaluation. Because whether && or ||, if the first clause true, no needs to evaluate the rest of the condition.

if($b > $c || $c > $a){

echo"First clause is $b > $c which is true, therefore, it will run. Always care about first clause. Short circuit evaluation \n";

}

if($b > $c && $c > $a){

echo"First clause is $b < $c which is false, therefore, it will not run. Always care about first clause. Short circuit evaluation \n";

}

3. How does your programming language deal with the “dangling else” problem?

PHP deals with the “dangling else” by using the bracket {} and parentheses (). Parentheses are for the condition, while brackets are the action that satisfy the condition. Moreover, PHP does not have then, but the following if or elseif is actually a then of itself

4. Does your language include multiple types of loops (while, do/while, for, foreach)? If so, what are they and how do they differ from each other?

PHP does have multiple types of loops such as, while, do/while, for, foreach. While, do/while and for are pretty much similar. They all need a condition, and a change in one of the loop control (such as $a++), otherwise it will go on forever. While is a more simplicated version of do/while. While has () as the condition, whatever inside {} is the “do”. For loop I can create a local, temporary variable as the loop control (most commonly as $i). $i will keep changing and repeating until it meets the condition. Foreach is for array, meaning for each item within the array. But it is quite different from the other 3 because it needs the values of the array in the () instead of the loop control, and the values are the loop control.

5. Can you use break or continue statements (or something similar) to exit loops?

Yes I can. For example:

$a = 10;

$b = 5;

while ($b < $a){

if ($b == 8){

echo "Break at b: $b \n";

break;

}

echo "B: $b \n";

$b++;

}

This will stop at 8, even though 8 is less than 10.

6. If your language supports switch or case statements, do you have to use “break” to get out of them? Can you use “continue” to have all of them evaluated?

Yes, it is quite necessary to use “break”. Otherwise, it will go on and on automatically until the last case. I can also use continue to have all of them evaluated as well.

7. Is there anything special in terms of control flow that your language does that isn't addressed in this assignment? If so, what is it and how does it work? Make sure to include an example of it in your code as well.

Foreach loop in PHP is quite different from Python and Java.

$arr = array(1,2,3,4);

foreach ($arr as &$value){

echo "For each item of array: $value \n";

$value = $value \*2;

echo "After \*2: $value \n";

}

$value is the element within the array. Java does not have a specific foreach loop, but it use for loop and(or) index to call out each other element. For example in Java:

for (type var : arr)

{

var = var \*2;

System.out.println(var);

}

Or

for(int i =0; i <arr.size(); i++){

int temp = arr[i];

temp = temp \*2;

System.out.println(temp);

}

And for Python:

for items in arr:

temp = items \* 2;

Foreach in PHP will automatically count the size of the array as the control flow of the loop and will loop through each variable. No needs to create temp or involve with for i loop.

If your language doesn't support anything like this, then explain why not and what it does instead (feel free to check in with me on this if you aren't sure what your language does).

Make sure that your answers are clear, accurate, and fully-formed: remember that these tutorials are public, and GitHub users don't have the context of the assignment that you do. Explain the reasoning behind the answers as much as possible. If there is no clear-cut answer to a question, explain why not. And cite your sources!

You can incorporate code into your tutorial to show examples, but you should also have a file in your repository that is just commented code, that demonstrates how all of these FoPC statements are written in your language. This should be a file that someone could download and run.