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CS4250

Homework5

1. C#’s **switch** statement is safer than that of C because:

. C# has a static semantics rule that disallows the implicit execution of more than one segment.

. Every segment must end with an explicit unconditional branch statement which transfer control out of the switch statement, or a goto, which can transfer control to one of the selectable segments.

2. C’s **for** statement is more flexible than in many other languages:

. In theC’s **for** statement there are three expressions and these expressions are optional.

. Each expression can be entire statement or sequence.

. Expression value is value of last statement.

. Everything can be changed within the loop.

. Legal to branch into the body of a loop.

3. Three situations where a combined counting and logical looping statement is needed:

1. A list of values is to be added to a SUM, but the loop is to be exited if SUM exceeds some prescribed value.

2. A list of values is to be read into an array, where the reading is to terminate when either a prescribed number of values have been read or some special value is found in the list.

3. The values stored in a linked list are to be moved to an array, where values are to be moved until the end of the linked list is found or the array is filled, whichever comes first.

4. Problem #1 on page 362.

a. Code in C, C++, Java or C#

The syntax of **for** loop is the same in C, C++, Java and C#.

**for** (k=((j+13)/27)+1; k<=10; k++)

{

i = 3 \* k -1;

}

b. Code in Python:

In Python **for** loop iterates over a list. Here a method named range() is defined also with the help of which we can define initial and final range for a loop.

tmp = **range**(((j+13)/27)+1, 11)

**for** k in tmp

i = 3\*k -1

tmp is a variable which is used to hold a list of all values from initial value to final.

c. Code in Ruby:

**for** k in (((j + 13)/27)+1) .. 10 **do**

i = 3 \* k - 1

**end**

-Best Writability: In Python’s for loop there is no closure reserved word is used (end, for), but it is not flexible as the iteration is over the list. In Ruby end closure reserved word is used which makes it hard to write. Therefore, C, C++, Java or C# has the best writability.

-Best Readability: The complexity of for loop in C, as assignment, increment and decrement statements are placed inside a loop, readability of for loop is hard. The for loop in Python, there is no symbol exist to indicate end of the loop. The for loop in Ruby, end reserved word is used to indicate end of the loop which makes it ambiguous as user will confuse in making decision that it is ending of for loop.

Thus, the best readability is Ruby.

Readability is more important than writability for a best programming language. Ruby’s for loop has the best combination of both.

5. Problem#3 page 362-363

1. Multiple selection in C, C++, Java or C#

switch(k){

case 1: j=2\*k-1;

break;

case 2: j=2\*k-1;

break;

case 3: j=3\*k+1;

break;

case 4: j=4\*k-1;

break;

case 5: j=3\*k+1;

break;

case 6: j=k-2;

break;

case 7: j=k-2;

break;

case 8: j=k-2;

break;

default: printf(“Wrong value!”);

break;

}

Merits: C switch is flexible as compared to other languages. The control flow is also allowed between each of the selectable. For example, the empty case is also allowed in c. Therefore, it does not allow any implicit branches. Another merit of using this multiple selector is that there are not any restrictions over the case expressions placement. They can be located anywhere within the switch statement.

b. Python:

if (k==1) | (k==2):

j=2\*k-1

elif (k==3) | (k==5):

j=3\*k+1

elif k==4:

j=4\*k-1

elif (k==6) | (k==7) | (k==8):

j=k-2

Merits: In Python, the multiple selection statement are absent and thus the else-if version is used to accomplish the task. This gives an advantages of readability. Also boolean expression can be easily evaluated by selectable statement rather than switches. The if else-if clauses are more general than the other multiple selections statements.

c. Ruby:

case

when (k==1) || (k==2) then j=2\*k-1

when (k==3) || (k==5) then j=3\*k+1

when (k==6) || (k==7) || (k==8) then j=k-2

end

Merits: In Ruby, there are two forms that can be used to implement multiple selection constructs. Both of them have the case expression and both are evaluated as the result of the last expression which is a boolean evaluation of the expression from top to bottom.

6. Problem #4 page.363

int main()

{

int j = -3;

int i;

for (i=0; i < 3; i++)

{

if ((j+2)==3 || (j+2)==2)

j—;

if ((j+2)==0)

j+=2;

else

j=0;

if (j>0)

i = 2;

else

j = 3 - i;

}

-If-else are used instead of case statements to select one of various possible conditions. As break is used to get out of the loop and not execute remaining statements, similarly if-else is used to select one out of several statements.