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4-11-16
CSCI 330
Assignment 7

Chapter 6:

Review Questions:

1. A block of programming that analyzes variables and chooses a direction in which to go based on given parameters.

3. A block is a section of code that is grouped together.

4. Where should the control mechanism appear in the statement, How are the else clauses designed, what delineates a selected block, what is the type the selector is based.

8. Use of braces, have 'endif' statement

13. C# forces the user to have a break statement at the end each clause. This reduces the risk of having logic errors in your program.

19. The range function generates a list of numbers usually used to iterate over with a for loop.

26. A user defined iterator control would need to be designed by the user to be able to get elements one at a time from the collection. The iterator must remember the last presented element so it does not show an element more than once. And the iterator must also be able to show every element in the collection.

28. Repetition in functional languages is based on recursion. If there is a limited number of times that the operation should be performed, then the user will need to pass a counter to the function call.

31. Dijkstra's guarded commands are the basis function definitions of Haskell.

Problem Set:

1. Three situations are:
    a. If a list is being iterated over, and you do not want operate on the rest of a list if a certain condition is met.
    b. Merging two lists, where we do not know the length of the second list.
    c. Modifying a variable in a loop, and need to break out of the loop if a certain condition is met.

4. Having closing keywords adds to the language, which inherently increases complexity, but having these keywords can make the code much more readable.

5. It forces the coder to format the code, which helps create clean looking code. It can be a point of error for the programmer, making errors harder to detect.

9. An advantage of allowing only Boolean values in if statements is that we always know they operations in the statement will return a Boolean. This decreases complexity.
A disadvantage is that more lines of code must be written to handle assignments.

11. Java's for loop is built to iterate over collections. This allows the programmer to not need to worry about checking for overflow issues.
14. Perhaps the designers of the language knew that many operating systems processes would run as infinite loops. This transfer of control allows the loop to skip parts of code within these loops if needed. Consider the case of a server running that has nothing to process.

Part 2: Programming

a. Fortran

```
do K = (j+13)/27
                if (K > 10) then
                end if
                K = k + 1
          I = 3*k - 1
end do
```

b. Ada

```
Looper:
        while k > 10 loop
                K=k+1
                I=3*k-1
        end loop Looper;
```

c. java

```
while (k <= 9) {
        k = k + 1;
        i = 3*k - 1;
}
```

d. Python

```
while (k <= 9):
        k = k + 1
        i = 3*k - 1
```

e. Ruby

```
while k <= 9 do
        $k = $k + 1
        $i = 3*$k - 1
end
```

Question 3:

```
switch (k) {
        case 1:
        case 2:
                j = 2*k -1;
                break;
        case 3:
        case 5:
                j = 3*k + 1;
                break;
        case 4:
                j = 4*k - 1;
                break;
        case 6:
        case 7:
        case 8:
                j = k - 2;
           break;
        default:
}
```