

Questions

1. Define selection statement.

Selection statements provide the means of choosing between two or more paths of execution. There are two types: two-way and multiple-way selectors.

2. What is the general form of a two-way selector?

```
if control_expression
    then clause
    else clause
```

3. What is the role of the default segment in a switch statement?

The **default segment** is there for the cases that are not represented in the switch statement. In a language like C, the switch statement will not run unless there is a default statement.

4. Does Python have a multi-selection statement? If so, does it have a default segment?

Python has multiple-way selection **using if statements**. There is **no required default segment**, but the “else” statement can be used as the default that will execute if none of the other cases are met.

5. Explain how C#'s switch statement is safer than that of C.

C# is safer because it has a **static semantics rule** that disallows the implicit execution of more than one segment. Another rule that makes C# safer is the fact that each selectable segment must end with an **unconditional branch**.

6. What mechanism does a compiler follow when the number of cases in a selection statement is 10 or greater to optimize the time required to execute?

When the number of cases in a selection statement is more than 10, then it will use a hash table of case values.

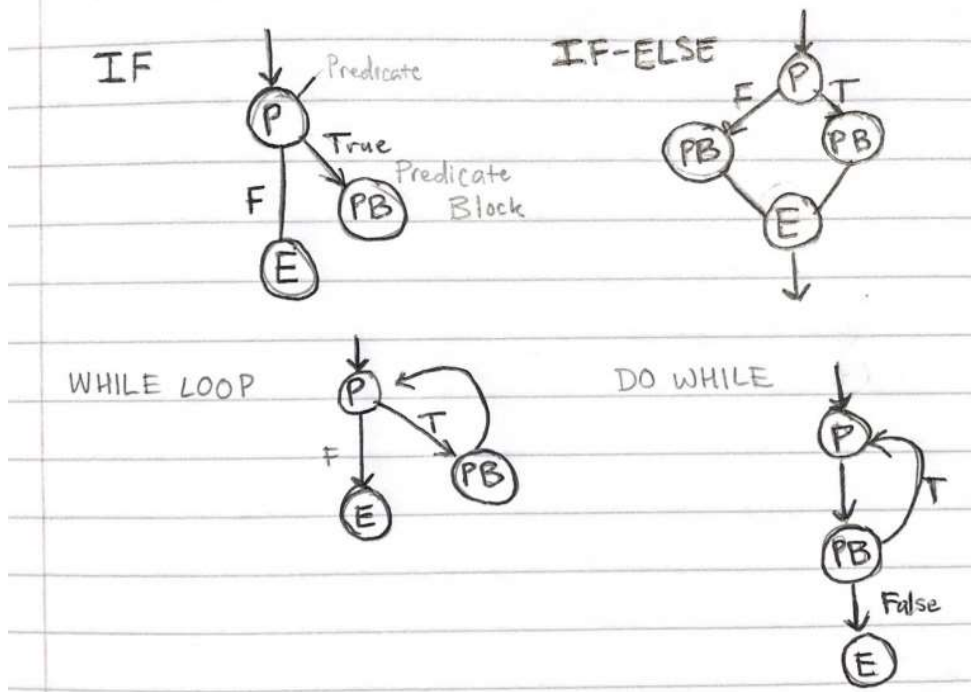
7. What is a loop variable? What is step-size?

A **loop variable** is the count value used by a counting iterative control statement. The **step-size** is the difference between sequential loop variable values. For example in a for loop: *for(int i = 0; i < 10; i++)*, the loop variable is i and the step-size is 1.

8. What is the difference between a pretest version and a posttest version of a logical loop?

A loop completion test can be a pretest or posttest. The **pretest** is performed before a loop is executed, and a **posttest** is performed after the loop body is executed.

9. Draw and label the four primes of selection statements as shown in class.



10. In C, what is the significance of a for loop without the second expression?
Without the second expression, the loop will be infinite.

11. What does the range function in Python do?

The range function will take in one, two or three parameters. If there is one parameter n , it will return all values from 0 to $n-1$. If there are two (say n and m), it will return values from n to $m-1$. If there are three parameters (say n , m , s), it will return all values from n to $m-1$ with a step-size s .

12. What alternative is provided for goto in Java?

Instead of goto statements, Java allows labels. The **break** label allows a unconditional labeled exit.

13. What are the differences between the break statement of C++ and that of Java?

The break in C++ are **unconditional unlabeled exits**. The breaks of Java are **unconditional labeled exits**.

14. What is the control structure in java known as that iterates based on data structures.

The control structure in Java is **for**, known as **foreach**.

15. What are the pros and cons of using unique closing reserved words on compound statements?

An advantage from using unique closing reserved words is readability. A disadvantage is having more keywords in a language, which makes it more complicated.

16. What are the arguments, pros and cons, for Python's use of indentation to specify compound statements in control statements?

One pro to requiring indentation is the aid to readability. With indentation, everything is very clear and easy to read. However, requiring this is a disadvantage for writability. Being forced to follow a certain code format will be a burden for those that are used to their own coding format.

17. Speculate as to the reason control can be transferred into a C loop statement.

The reason why control can be transferred into a C loop statement is because there can be multiple statements within. Using goto's and breaks may cause someone to create messy code, but some people know how to use them in a way that does not create messy code, so the C language allows it.