

Start reading chapter 7 on loops.
The lectures on the ProgramLive CD can be a big help.

“O! Thou hast damnable iteration and art, indeed, able to corrupt a saint.” Shakespeare, *Henry IV*, Pt I, 1 ii

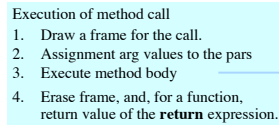
“Use not vain repetition, as the heathen do.”

Matthew V, 48

Your “if” is the only peacemaker; much virtue if “if”.

Shakespeare, *As You Like It*.

Understanding this not only prepares you for prelim 2, it helps you understand how recursion can work and how a method determines what variables mean.



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- To execute the while loop:
- (1) Evaluate condition $k \neq 9$;
if false, stop execution.
- (2) Execute the repetend.
- (3) Repeat again from step (1).

Trace execution of the loop: Study section 7.1.2 shows you how to “trace” execution of a loop.

BUT: We always make the *<repetend>* a block.

```
int k= 5;
while ( k != 9) {
    System.out.println(k*k);
    k= k+1;
}
```

x n

In this notation, we require $h \leq k-1$. $h..h-1$ is the empty set.

Understanding assertions

What value of m makes this assertion true?

d is the number of days before month m m d 31

Below, write in English what has to be done to d so that the final assertion is true. Make it a COMMAND to do something

// { d is the number of days before month m and m is in 1..11 }

m = m + 1;

m ?

d ?

h..k is the set of values h, h+1, h+1, ..., k.
In this notation, we require $h \leq k-1$. h..h-1 is the empty set.

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Understanding assertions

What value of x makes this assertion true?

b false x 1

b = "some value in 5..9 divides x" b x 16

b x 10

Below, fill in the assignments so that the assertion is true afterward.

k = ; b x ?

b = ;

// { b = "some value in 2..k divides x" } k

h..k is the set of values h, h+1, h+1, ..., k.
In this notation, we require $h \leq k-1$. h..h-1 is the empty set.

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Understanding assertions

Fill in the space after the assignment to k with an if-statement so that the assertion remains true after execution.

// { b = "some value in 2..k divides x" }

k = k + 1;

Make up an example, if it helps, but learn to work in this more abstract setting

b ? x ?

// { b = "some value in 2..k divides x" }

k ?

h..k is the set of values h, h+1, h+1, ..., k.
In this notation, we require $h \leq k-1$. h..h-1 is the empty set.

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Understanding assertions

// { nothing has been printed }

k = ;

// { squares of 5..k-1 printed }

Fill in the assignments on this page so that the assertions following them are true.

k = ;

// { All chars in String s[0..k-1] are '\$' }

// { k ≥ 1 }

k = ;

c = ;

// { c is the smallest character in s[0..k-1] }

Hint: make the range 0..k-1 as small as possible

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Understanding assertions

Suppose this assertion is true:

x = sum of 1..k

Under what extra condition is this one true?

x = sum of 1..n

Put your answer here

Suppose this assertion is true:

x = sum of h..10

Under what extra condition is this one true?

x = sum of 1..10

Put your answer here

Suppose this assertion is true:

no value in h..k divides x

Under what extra condition is this one true?

no value in 2..n-1 divides x

Put your answer here

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Understanding assertions

0 1 2 3 4 5 6 7 8
v X Y Z X A C Z Z Z

This is a list of Characters

0 3 k 8
v ≥ C ? all Z's k 6

0 3 k 8
v ≥ C ? all Z's k 5

0 k 8
v ≥ C all Z's k 6

0 k 8
v ≥ W A C all Z's k 4

This is an assertion about v and k. It is **true** because chars of v[0..3] are greater than 'C' and chars of v[6..8] are 'Z's.

Indicate whether each of these 3 assertions is true or false.

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