CS-259
Data Structures with Java
Loops and Nested Loops

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Quiz 1: Chapter 1

Which of the following would Horstmann and Cornell argue is most true Java?

A. Java puts a lot of emphasis on early checking for possible problems.
B. JavaScript is a simpler version of Java.
C. Java is an extension of HTML.
D. Java is an easy programming language to learn.
E. Java is interpreted.

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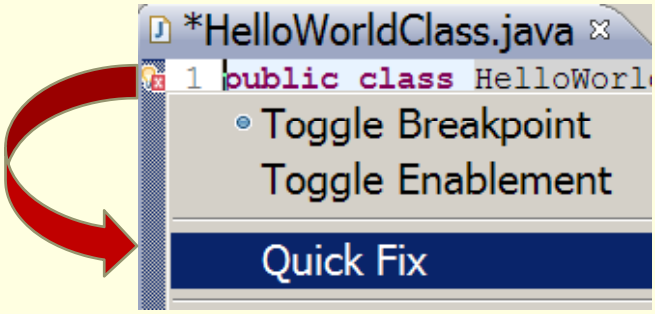
Beware the Quick Fix

Programming is not a trial-by-error craft.

At best, this creates a working machine spun of un-unravelable glass threads. At worst it leads to confusion and darkness.



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Loop0

```
public class Loop0
{ public static void main(String[] args)
  {

    for (int i=0; i<5; i++)
    { System.out.print(i + ", ");
    }

    System.out.println("");
  }
}
```

Does not add linefeed to end of printed string.

```
0, 1, 2, 3, 4,
```

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Loop1

```
public class Loop1
{ public static void main(String[] args)
  { int a = 1;
    int b = 10;
    for (int i=0; i<5; i++)
    { int c = a + b;
      a = a * 2;
      b = b * 2;

      System.out.println(a + ", " + b + ", " + c);
    }
  }
}
```

What might be inefficient about this?

However, it is not inefficient because a good compiler will not repeat allocate/free. Rather it will keep **c** in a register.

```
2, 20, 11
4, 40, 22
8, 80, 44
16, 160, 88
32, 320, 176
```

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Quiz: Loop2 – What is the Output?

```
public class Loop2
{ public static void main(String[] args)
  { int a = 2;
    for (int i=5; i<8; i++)
    { System.out.print("(" + i + "," + a + ")  ");
    }
    System.out.print("");
  }
}
```

```
A. (5,2)  (6,2)  (7,2)  (8,2)
B. (5,5)  (6,6)  (7,7)  (8,8)
C. (5,0)  (6,0)  (7,0)  (8,0)
D. (5,2)  (6,2)  (7,2)
E. (5,6)  (6,7)  (7,8)
```

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Quiz: Loop3 – What is the Output?

```
public class Loop3
{ public static void main(String[] args)
  { int a = 2;
    for (int i=5; i<8; i++)
    { a = a + i;
      System.out.print("(" + i + "," + a + ")  ");
    }
    System.out.print("");
  }
}
```

A. (5,2) (6,2) (7,2)

B. (5,2) (6,7) (7,7)

C. (5,7) (6,8) (7,10)

D. (5,2) (6,7) (7,13)

E. (5,7) (6,13) (7,20)

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NestedLoop1

```
public class NestedLoop1
{ public static void main(String[] args)
  { int count = 0;
    for (int i=0; i<4; i++)
    { for (int k=0; k<3; k++)
      { count++;
        int a = i * k;
        System.out.println(count +
           ") " +i+ ", " +k+ ", " +a);
      }
    }
  }
}
```

```
1) 0, 0, 0
2) 0, 1, 0
3) 0, 2, 0
4) 1, 0, 0
5) 1, 1, 1
6) 1, 2, 2
7) 2, 0, 0
8) 2, 1, 2
9) 2, 2, 4
10) 3, 0, 0
11) 3, 1, 3
12) 3, 2, 6
```

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Lab 1: Integers divisible by 2 through 13

Use Eclipse to write a Java program that prints:

1. All numbers less than 50 that are divisible by 2.
2. Then, all numbers less than 50 divisible by 3.
3. Then, all numbers less than 50 divisible by 4.
4. Then all numbers less than 50 divisible by 5.
5. ....
6. Then all numbers less than 50 divisible by 13.

Source code (.java file) due in WebCT by midnight Wednesday, Aug 26.

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