

Practice Problems: Loop

1. Understanding code

Draw a representation of what the computer's memory looks like at the end of each of these programs, and provide the display result on screen (by System.out.print or System.out.println). For instance:

```
public class Simple-While {
    public static void main(String [] args) {
        int x = 1;
        while(x < 10) {
            System.out.println("x = " + x);
            x++;
        }
    }
}
```

x: starts at 1, changes to 2, then 3, then 4, then 5, ..., then 9, then

10

screen

```
x = 1
x = 2
x = 3
x = 4
x = 5
...
x = 8
x = 9
```

(NOTE: *x* = 10 does NOT get printed by this program)

```
public class Simple-While2 {
    public static void main(String [] args) {
        int number = 1;
        while (number <= 200) {
            System.out.print(number + " ");
            number *= 2;
        }
    }
}
```

```
public class Infinite-While {
    public static void main(String [] args) {
        boolean b = true;
        while(b) {
            System.out.println("are we there yet?");
        }
    }
}
```

```

public class Complex-Update {
    public static void main(String [] args) {
        int x = 2;
        while(x < 1000) {
            System.out.println("x = " + x);
            x = x * x;
        }
    }
}

public class Infinite-For {
    public static void main(String [] args) {
        for( ; true; ) {
            System.out.println("are we there yet?");
        }
    }
}

public class Complex-Update-For {
    public static void main(String [] args) {
        for(int i = 2; i < 1000; i = i * i) {
            System.out.println("i = " + i);
        }
    }
}

public class Factor {
    public static void main(String [] args) {
        int number = 13;
        int factor = 2;
        while (number % factor != 0) {
            factor++;
        }
        System.out.println("First factor: " + factor);
    }
}

public class Sum {
    public static void main(String [] args) {
        int sum = 0, n =12345;
        while (n > 0) {
            sum += n % 10;    // add last digit to sum
            n = n / 10;      // remove last digit
        }
        System.out.println("sum = " + sum);
    }
}

```