CIS 1068

October 16, 2018
administrative stuff

► ☐☐☐ ADD ME ☐☐☐
Midterm

- Remember, the material is cumulative
- You’ll see this stuff again
Legal Identifiers

- c00lg33k is a legal identifier
Legal Identifiers

- c001g33k is a legal identifier **true**
Legal Identifiers

- c00lg33k is a legal identifier \textbf{true}
- 2Be0rWhat is a legal identifier.
Legal Identifiers

- c00l3g33k is a legal identifier **true**
- 2Be0rWhat is a legal identifier. **false**
question

True or false: it’s legal to have variables named `sammy` and `Sammy` in the same program, but not in the same scope.
question
True or false: it’s legal to have variables named sammy and Sammy in the same program, but not in the same scope.

answer
True. Java is case sensitive. sammy and Sammy are considered to be two different variables. (Bad idea, but not illegal)
What’s the most important job of the Java compiler?

▶ to find syntax errors in my code
▶ to run my code
▶ to translate my code into more primitive instructions
▶ to find logic errors in my code
▶ to ruin my weekends
What’s the most important job of the Java compiler?

- to find syntax errors in my code
- to run my code
- *** to translate my code into more primitive instructions ***
- to find logic errors in my code
- to ruin my weekends
public class WhatsPrinted08 {
    public static void main(String args[]) {
        String s1="bob";
        String s2="lob";
        String s3="law";
        for (int i=0; i<6; i++) {
            if (i%2==0) {
                s1+=s2;
                i++;
            } else {
                s1=s2+s3;
            }
        }
        System.out.println(s1);
    }
}
What’s printed by the following?

```java
class WhatsPrinted08 {
    public static void main(String args[]) {
        String s1 = "bob";
        String s2 = "lob";
        String s3 = "law";

        for (int i = 0; i < 6; i++) {
            if (i % 2 == 0) {
                s1 += s2;
                i++;
            } else {
                s1 = s2 + s3;
            }
        }

        System.out.println(s1);
    }
}
```

Answer: bobloblobloblob
public class WhatsPrinted2 {
    public static void main(String args[]) {
        int nx=0;
        for (int i=0; i<3; i++) {
            int lastNX=nx;
            for (int j=0; j<8; j++) {
                if (((i+j)%2==0) {
                    nx++;
                }
            }
        }
        System.out.println(lastNX);
    }
}
What’s printed by the following?

```java
public class WhatsPrinted2 {
    public static void main(String args[]) {
        int nx=0;
        for (int i=0; i<3; i++) {
            int lastNX = nx;
            for (int j=0; j<8; j++) {
                if ((i+j)%2==0) {
                    nx++;
                }
            }
        }
        System.out.println(lastNX);
    }
}
```

Answer: error. lastNX accessed out of scope.
About how much is a terabyte?

- $10^3$ bytes
- $10^6$ bytes
- $10^9$ bytes
- $10^{12}$ bytes
- $10^{15}$
About how much is a terabyte?

- $10^3$ bytes
- $10^6$ bytes
- $10^9$ bytes
- *** $10^{12}$ bytes ***
- $10^{15}$
What’s printed by the following?

```java
public static void main(String args[]) {
    func(10);
}

public static void func(int start) {
    int i = start;
    do {
        System.out.println(i);
        i++;
    } while (i < 10);
}
```
What’s printed by the following?

```java
public static void main(String args[]) {
    func(10);
}

public static void func(int start) {
    int i=start;
    do {
        System.out.println(i);
        i++;
    } while (i<10);
}
```

**Answer:** 10
What’s printed by the following?

```java
public class WhatsPrinted01 {
    public static void func(int x, int y, int z) {
        y += 3;
        x = y / 4;
        z++;
    }
    public static void main(String []args) {
        int x = 10, y = 20, z = 30;
        func(y, z, x);
        System.out.println(y);
    }
}
```
What’s printed by the following?

```java
public class WhatsPrinted01 {
    public static void func(int x, int y, int z) {
        y+=3;
        x=y/4;
        z++;
    }

    public static void main(String[] args) {
        int x=10, y=20, z=30;
        func(y, z, x);
        System.out.println(y);
    }
}
```

Answer: 20
What’s printed by the following?

```java
public class WhatsPrinted4 {
    public static void func(int x, int y, int z) {
        x += y + 2;  // x = x + y + 2
        y--;        // y = y - 1
        z /= 2;     // z = z / 2
        System.out.println(z);
    }

    public static void main(String args[]) {
        int x = 10, y = 20, z = 30;
        func(z, x, y);
    }
}
```
What’s printed by the following?

```java
public class WhatsPrinted4 {
    public static void func(int x, int y, int z) {
        x+=y+2;
        y--;
        z/=2;
        System.out.println(z);
    }
    public static void main(String[] args) {
        int x=10, y=20, z=30;
        func(z, x, y);
    }
}
```

Answer: 10
What’s printed by the following?

```java
public class WhatsPrinted5 {
    public static int func(int y) {
        return y*2%5;
    }

    public static void main(String args[]) {
        int x=10;
        func(x);
        System.out.println(x);
    }
}
```
What's printed by the following?

```java
public class WhatsPrinted5 {
    public static int func(int y) {
        return y*=2%5;
    }

    public static void main(String args[]) {
        int x=10;
        func(x);
        System.out.println(x);
    }
}
```

Answer: 10
What's printed by the following?

```
public class WhatsPrinted {
    public static void main(String args[]) {
        int y=10;
        func(y);
        System.out.println(y);
    }
    public static void func(int x) {
        x+=7%3;
    }
}
```
public class WhatsPrinted {
    public static void main(String args[]) {
        int y=10;
        func(y);
        System.out.println(y);
    }
    public static void func(int x) {
        x+=7%3;
    }
}
class WhatsPrinted10 {
    public static void main(String args[]) {
        f3();
        System.out.println();
    }

    public static void f2() {
        f1();
        System.out.print("b");
    }

    public static void f3() {
        f1();
        System.out.print("c");
        f2();
    }

    public static void f1() {
        System.out.print("a");
    }
}
class WhatsPrinted10 {
    public static void main(String args[]) {
        f3();
        System.out.println();
    }

    public static void f2() {
        f1();
        System.out.print("b");
    }

    public static void f3() {
        f1();
        System.out.print("c");
        f2();
    }

    public static void f1() {
        System.out.print("a");
    }
}
public class WhatsPrinted3 {
    public static void ifElse(int a, int b) {
        if (a < b) {
            a++;
        }
        if (a < b) {
            a++;
        } else {
            b++;
        }
        if (a >= b) {
            b = b - 5;
        }
        System.out.println(a + "," + b);
    }

    public static void main(String args[]) {
        ifElse(10, 5);
        ifElse(3, 9);
    }
}
What’s printed by the following?

```java
public class WhatsPrinted3 {
    public static void ifElse(int a, int b) {
        if (a < b) {
            a++;
        }
        if (a < b) {
            a++;
        } else {
            b++;
        }
        if (a >= b) {
            b = b - 5;
        }
        System.out.println(a + "\", " + b);
    }
    public static void main(String args[]) {
        ifElse(10,5);
        ifElse(3,9);
    }
}
```

Answer:
10,1
5,9
!(2<7%2*3 || 5%10>5+3)

**Answer:** false
\[
\frac{516}{10} / 5 / 2.0 \times 2 + 14 / 5
\]

**Answer:** 12.0
$5/21.0 == 5/21$
5/21.0 == 5/21

Answer: false
"hammer".substring(0, 4) + "myopic".charAt(1);
"hammer".substring(0,4) + "myopic".charAt(1);

Answer: "hammy"
(1 + 2) + "." + 3 * 4 + 5 + 6

"3.1256"
(1 + 2) + "." + 3 * 4 + 5 + 6

Answer:"3.1256"
10 - \( \frac{2}{3} \times 3 \)

10
10 - 2/3*3

Answer: 10
8 % 9 - 5 * 9 / 3 + 5 \% 2 = 6
8\%9 - 5*9/3 + 5\%2

**Answer:** -6
Question

Translate each of the following statements from English to Java. For example, if the English is "x is larger than 10", you’d write the Java expression \( x > 10 \). Assume that we already have int \( x \), int \( y \), and the String \( s \) and String \( t \) properly declared somewhere else in our program.

\( t \) does not occur in \( s \).
Question
Translate each of the following statements from English to Java. For example, if the English is "x is larger than 10", you’d write the Java expression $x > 10$. Assume that we already have int $x$, int $y$, and the String $s$ and String $t$ properly declared somewhere else in our program.

t does not occur in $s$.

Answer

!$s$.contains($t$);

or

$s$.indexOf($t$) == -1
Question

The product of $x$ and $y$ odd.
Question
The product of x and y odd.

Answer
x*y%2==1
Question
The number of characters in s is larger than the number of characters in t.

Answer
s.length() > t.length()
Write a method which takes the name of a file as an parameter. The method returns the number of vowels found in the word in the file that contains the greatest number of vowels. You may assume that the file contains only words and whitespace (i.e., no punctuation, no letters). You are not required to handle FileNotFoundException.
public static int mostVowels(String filename) throws FileNotFoundException {
    Scanner in = new Scanner(new File(filename));
    int L=-1; // L for longest
    while (in.hasNext()) {
        int nv = numVowels(in.next());
        if (nv > L) {
            L = nv;
        }
    }
    return L;
}
public static int numVowels(String s) {
    int count = 0;
    for (int i = 0; i < s.length(); i++) {
        if (isVowel(s.charAt(i)))
            count++;
    }
    return count;
}
another, shorter helper

```java
public static boolean isVowel(char c) {
    return c=='a' || c=='e' || c=='i' || c=='o' ||
           c=='u' || c=='A' || c=='E' || c=='I' ||
           c=='O' || c=='U';
}
```
part b

Write the single line of code which calls your method to find out the word with the most vowels in a file called "dictionary.txt" saving the result in an integer variable called maxVowels.
part b
Write the single line of code which calls your method to find out the word with the most vowels in a file called "dictionary.txt" saving the result in an integer variable called maxVowels.

answer

```java
int maxVowels = numVowels("dictionary.txt");
```
Write the few lines of code that print the integers between 27 and 851 that are divisible by 7 (i.e. 28, 35, 42, ...) as a:

for loop

```java
for (int i=27; i<=851; i++) {
    if (i%7==0) {
        System.out.println(i);
    }
}
```
Write the few lines of code that print the integers between 27 and 851 that are divisible by 7 (i.e. 28, 35, 42, ...) as a:

```java
int i=27;
while (i<=851) {
    if (i%7==0) {
        System.out.println(i);
    }
    i++;
}
```
Write the few lines of code that print the integers between 27 and 851 that are divisible by 7 (i.e. 28, 35, 42, ...) as a:

**do-while loop**

```java
int i=27;
do {
    if (i%7==0) {
        System.out.println(i);
    }
    i++;
} while (i<=851);
```
Write a method which is passed a String. The method returns the index of the last vowel found in the String or -1 if no vowels are found. Recall that the vowels are \{'a','e','i','o','u'\} (and the equivalent upper-case letters).
Write a method which is passed a String. The method returns the index of the last vowel found in the String or -1 if no vowels are found. Recall that the vowels are \{'a','e','i','o','u'\} (and the equivalent upper-case letters).

One possibility

```java
public static int indexOfLastVowel(String s) {
    for (int i=s.length()-1; i>=0; i--) {
        if (isVowel(s.charAt(i))) {
            return i;
        }
    }
    return -1;
}
```

with `isVowel()` exactly the same as in a previous problem.
part b

Call your method in order to determine the index of the last vowel found in "fall break" storing the result in the integer variable named dex.
part b
Call your method in order to determine the index of the last vowel found in "fall break" storing the result in the integer variable named dex.

answer

```
int dex = indexOfLastVowel("fall break");
```