CIS 1068
Midterm 1 Notes

October 14, 2019
c001g33k is a legal identifier.

- true
- false
c00lg33k is a legal identifier.

- true
- false
babble_babble is a legal identifier.

- true
- false
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- true
- false
It’s legal to have variables named `sammy` and `Sammy` in the same program, but not in the same scope.

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▸ true

▸ false
2BeOrWhat is a legal identifier.

- true
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- true
- false
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
What’s printed by the following?

```java
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
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;
                s1=s2+s3;
            }
        }
        System.out.println(s1);
    }
}
```

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

```java
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;
    }
}

Answer: 10
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);
    }
}
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
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);
    }
}
```

No = 20
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?

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();
        System.out.println();
    }
    public static void f1() {
        System.out.print("a");
    }
}
What’s printed by the following?

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");
    }
}

Answer: "acab"
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);
    }
}
```

Output:
```
10 1
5 9
```
What’s printed by the following?

```java
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;
        }
    }
    public static void main(String[] args) {
        ifElse(10,5);
        ifElse(3,9);
    }
}
```

Answer:

10,1
5,9
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
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
- $10^{12}$ bytes
- $10^{15}$
What’s printed by the following?

```java
public class WhatsPrinted {
    public static void main(String args[]) {
        int x = 15;
        int y = 1;
        for (int i=0; i<x; i++) {
            if (i % 2 == 0) {
                y = i;
            }
        }
        System.out.println(y);
    }
}
```
What’s printed by the following?

```java
public class WhatsPrinted {
    public static void main(String args[]) {
        int x = 15;
        int y = 1;

        for (int i=0; i<x; i++) {
            if (i % 2 == 0) {
                y = i;
            }
        }
        System.out.println(y);
    }
}
```

**Answer:** `Error://Symbol/not/Found 14`
public class Presidents {
    public static void main(String args[]) {
        int x=10, y=20, z=30;

        if (x<y) {
            System.out.println("Washington");
        } else if (((x+y)%2==0) {
            if (z>=30 || z<=30) {
                System.out.print("(not Quincy) ");
            }
            System.out.println("Adams");
        } else if (z-2 < y+1) {
            System.out.println("Jefferson");
        } else {
            System.out.println("Madison");
        }
    }
}
What’s printed by the following?

```
public class Presidents {
    public static void main(String args[]) {
        int x=10, y=20, z=30;

        if (x<y) {
            System.out.println("Washington");
        } else if ((x+y)%2==0) {
            if (z>=30 || z<=30) {
                System.out.print("(not Quincy) ");
            }
            System.out.println("Adams");
        } else if (z-2 < y+1) {
            System.out.println("Jefferson");
        } else {
            System.out.println("Madison");
        }
    }
}
```

**Answer:** Washington
Expression Evaluation

10 - \frac{2}{3} \times 3

10
Expression Evaluation

10 - 2/3*3

Answer: 10
Expression Evaluation

0

\[
\frac{5}{21.0} == \frac{5}{21}
\]
Expression Evaluation

5/21.0 == 5/21

*Answer:* false
Expression Evaluation

8%9 - 5*9/3 + 5%2

8 → 15 → 1
Expression Evaluation

8%9−5*9/3+5%2

Answer: -6
Expression Evaluation

\[(1 + 2) + "." + 3 * 4 + 5 + 6\]

\[3 - 12\]
Expression Evaluation

\[(1 + 2) + \".\" + 3 \times 4 + 5 + 6\]

**Answer:** “3.1256”
Expression Evaluation

516 / 10 / 5 / 2.0 * 2 + 14 / 5

/0.0 + 2
516 / 10 / 5 / 2.0 * 2 + 14 / 5

Answer: 12.0
Expression Evaluation

\(! (2 < 7 \% 2*3 \mid 5 \% 10 > = 5 + 3)\)
Expression Evaluation

!(2<7%2*3 || 5%10>=5+3)

Answer: false
Expression Evaluation

```
"hammer".substring(0,4) + "myopic".charAt(1);
```
"hammer".substring(0,4) + "myopic".charAt(1);

**Answer:** “hammy”
Translate English to Java

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

$(x + y) \% 2 == 1$
Translate English to Java

The product of x and y odd.

Answer

\((x \land y) \mod 2 == 1\)

*
The number of characters in $s$ is larger than the number of characters in $t$. 

$s.length() > t.length()$
The number of characters in $s$ is larger than the number of characters in $t$.

**Answer**

$s$.length() > $t$.length()
Translate English to Java

t does not occur in s

s.indexOf(t) == -1 OR s.contains(t) == false
t does not occur in s

Answer

s.indexOf(t) == -1
OR
s.contains(t) == false
Write a method which is passed two integers, \( L \) and \( H \) (for low and high). The method returns the sum of the integers from \( L \) to \( H \) inclusive. For example, if \( L \) is 5 and \( H \) is 11, the method returns 56 (which is \( 5 + 6 + 7 + 8 + 9 + 10 + 11 \)). If \( L \geq H \), return \( L \). You do not have to write a complete class. You do not have to use a Scanner to read user input from the keyboard.
One possibility

```java
public static int sumLH(int L, int H) {
    if (L>=H) {
        return L;
    }

    int s = 0;
    for (int i=L; i<=H; i++) {
        s += i;
    }
    return s;
}
```
Write the single line of code that calls your method in order to calculate the sum of the integers from -56 to 30 and stores the result in an integer named `sum`.

```
Answer
sum = sumLH(-56, 60);
```
Write the single line of code that calls your method in order to calculate the sum of the integers from -56 to 30 and stores the result in an integer named `sum`.

**Answer**

```
sum = sumLH(-56, 30);
```

30
Loops

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
while loop
int i = 28;
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 = 28;
do {
    if (i % 7 == 0) {
        System.out.println(i);
    }
    i++;
} while (i <= 851);
```
Program

Write a program that reads in a series of race times, which are recorded in seconds. The program should continue to read times until a negative time is entered. The program then prints the average of all times less that are less than or equal to QUALIFYING\_TIME, where QUALIFYING\_TIME is a constant that you define somewhere in your program. It then prints the fastest time entered.

If no race times are entered, instead of printing the fastest and average qualifying times, the program prints the text, "No times entered".
```java
public static final int QUALIFYING_TIME = 20;
public static void main(String []args) {
    int sumQual = 0;
    int numQual = 0;
    String prompt = "Enter race time (or a negative time to quit): ";
    Scanner in = new Scanner(System.in);
    System.out.print(prompt);
    int cur = in.nextInt();
    while (cur >= 0) {
        if (cur <= QUALIFYING_TIME) {
            numQual ++;
            sumQual += cur;
        }
        System.out.print(prompt);
        cur = in.nextInt();
    }
    if (numQual > 0) {
        System.out.println("Avg qualifying time: 
                          (double)sumQual/numQual);
    } else {
        System.out.println("No qualifying times");
    }
}
```