Exercises

1. What (if anything) is wrong with each of the following statements?

   a. `if (a > b) then c = 0;`

   There is no need to have the “then” statement, this doesn’t exists.

   b. `if a > b { c = 0; }`

   Is missing the “(“ and “)”.

   c. `if (a > b) c = 0;`

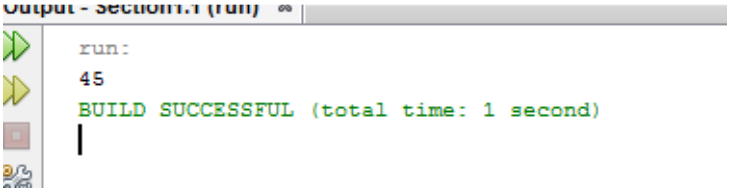
   Is correct

   d. `if (a > b) c = 0 else b = 0;`

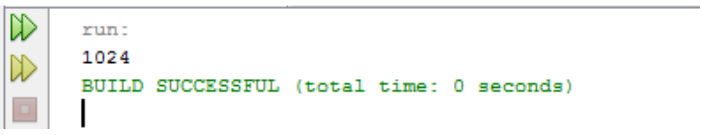
   Is missing the “;” next to c=0

2. Suppose that `i` and `j` are both of type `int`. What is the value of `j` after each of the following statements is executed?

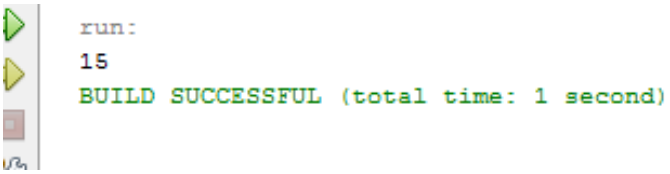
   a. `for (i = 0, j = 0; i < 10; i++) j += i;`



   b. `for (i = 0, j = 1; i < 10; i++) j += j;`



   c. `for (j = 0; j < 10; j++) j += j;`



d. `for (i = 0, j = 0; i < 10; i++) j += j++;`

```
run:
0
BUILD SUCCESSFUL (total time: 1 second)
```

3. Write a program FivePerLine.java that, using one `for` loop and one `if` statement, prints the integers from 1000 to 2000 with five integers per line. *Hint*: use the `%` operator.

```
Output - Section1.1 (run)
run:
1000 1001 1002 1003 1004
1005 1006 1007 1008 1009
1010 1011 1012 1013 1014
1015 1016 1017 1018 1019
1020 1021 1022 1023 1024
1025 1026 1027 1028 1029
1030 1031 1032 1033 1034
1035 1036 1037 1038 1039
1040 1041 1042 1043 1044
```

4. What is the value of `m` and `n` after executing the following code?

```
int n = 123456789;
int m = 0;
while (n != 0) {
   m = (10 * m) + (n % 10);
   n = n / 10;
}
```

```
Output - Section1.1 (run)
run:
n = 0
m = 987654321
BUILD SUCCESSFUL (total time: 1 second)
```

5. **Calendar.** Write a program `Calendar` that takes two command line arguments `m` and `y` and prints out the monthly calendar for the `m`th month of year `y`. For example, your output for `Calendar 2 2009` should be

```
   February 2009
 S  M Tu  W Th  F  S
 1  2  3  4  5  6  7
 8  9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
```

Web Exercises

1. What is wrong with the following code fragment?

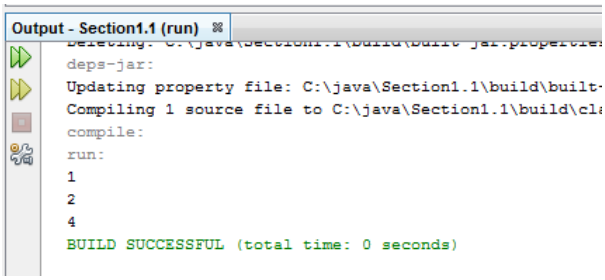
```
double x = -32.2;
boolean isPositive = (x > 0);
if (isPositive = true) System.out.println(x + " is positive");
else                   System.out.println(x + " is not positive");
```

Answer: It uses the assignment operator = instead of the equality operator ==. A better solution is to write `if (isPositive)`.

2. What does the following program do?

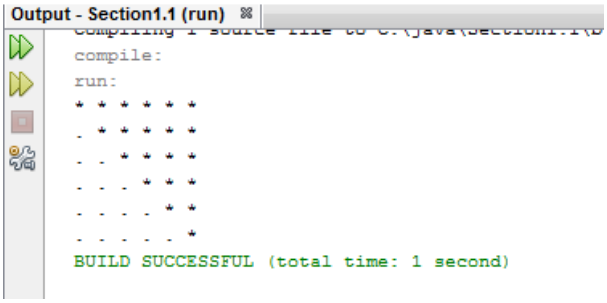
```
public static void main(String[] args) {
   int N = Integer.parseInt(args[0]);
   int x = 1;
   while (N >= 1) {
      System.out.println(x);
      x = 2 * x;
      N = N / 2;
   }
}
```

Answer: prints out all of the powers-of-two less than or equal to N.



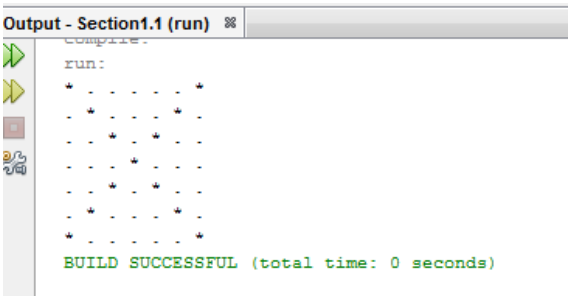
3. Write a program Triangle.java that takes a command-line argument N and prints an N-by-N triangular pattern like the one below.

```
* * * * * *
. * * * * *
. . * * * *
. . . * * *
. . . . * *
. . . . . *
```



4. Write a program Ex.java that takes a command-line argument N and prints a (2N + 1)-by-(2N + 1) ex like the one below. Use two `for` loops and one `if-else` statement.

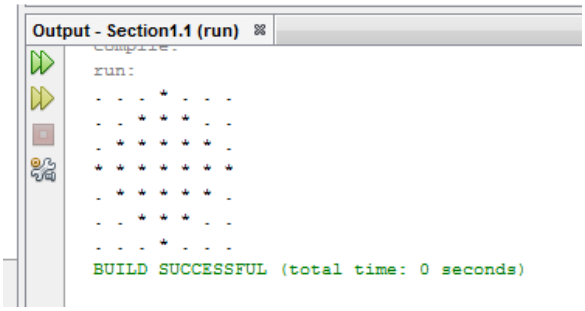
```
*   .   .   .   .   *
.   *   .   .   .   *   .
.   .   *   .   *   .   .
.   .   .   *   .   .   .
.   .   *   .   *   .   .
.   *   .   .   .   *   .
*   .   .   .   .   .   *
```



5. Write a program Diamond.java that takes a command-line argument N and prints a (2N + 1)-by-(2N + 1) diamond like the one below.

```
% java Diamond 4
.   .   .   .   *   .   .   .   .
.   .   .   *   *   *   .   .   .
.   .   *   *   *   *   *   .   .
.   *   *   *   *   *   *   *   .
*   *   *   *   *   *   *   *   *
.   *   *   *   *   *   *   *   .
.   .   *   *   *   *   *   .   .
.   .   .   *   *   *   .   .   .
.   .   .   .   *   .   .   .   .
```

Section 1.3



6. **Seasons.** Write a program `Season.java` that takes two command line integers M and D and prints the season corresponding to month M (1 = January, 12 = December) and day D in the northern hemisphere. Use the following table

SEASON	FROM	TO
Spring	March 21	June 20
Summer	June 21	September 22
Fall	September 23	December 21
Winter	December 21	March 20

```
int month = Integer.parseInt(args[0]);

      int day = Integer.parseInt(args[1]);


 if ( (month == 1) || (month == 2))

  System.out.println("The season is Winter");


 else if ( (month == 4) || (month == 5))

  System.out.println("The season is Spring");


 else if ( (month == 7) || (month == 8))
```

```
  System.out.println("The season is Summer");

 else if ( (month == 10)|| (month == 11))
  System.out.println("The season is Fall");

 else if ( (month == 3) && (day <= 19 ))
  System.out.println("The season is Winter");

 else if ( (month == 3) && (day >= 20 ))
  System.out.println("The season is Spring");

 else if ( (month == 6) && (day <= 20 ))
  System.out.println("The season is Spring");

 else if ( (month == 6) && (day >= 21 ))
  System.out.println("The season is Summer");

 else if ( (month == 9) && (day <= 20 ))
  System.out.println("The season is Summer");

 else if ( (month == 9) && (day >= 21 ))
  System.out.println("The season is Autumn");

 else if ( (month == 12) && (day <= 21 ))
  System.out.println("The season is Autumn");
```

```
  else if ( (month == 12) && (day >= 22 ))
   System.out.println("The season is Winter");
```