TOPIC 8 EXERCISES

Tracing Exercises

1. Suppose you have the following declaration.

   ```java
   String str;
   ```

Which of the following values can be assigned to the variable `str`? If any value cannot be assigned, explain why not.

(a) "dog"           (b) "4315"        (c) 43     (d) 4.5   (e) 'h'

2. What value will this string get after each of the following?

   ```java
   String day;
   Scanner kybd = new Scanner(System.in);
   ```

(a) `day = kybd.next();` and user enters "Tuesday"
(b) `day = kybd.next();` and user enters "next Tuesday"
(c) `day = kybd.nextLine();` and user enters "Tuesday the 24th"
(d) `day = kybd.nextLine();` and user enters "last Wednesday"

3. Show how to represent each of the following (assume that all variables have been declared to have type String):

(a) the character in position 5 of arr                   (b) the character in the first position of hold
(c) the character in position 3 of str                   (d) the character in position 1 of line
(e) the last character in hope   (Hint: this one is harder than the others-why?)

4. For (a), (b), and (c), show what each variable contains after the series of statements is executed. Use these declarations for each part:

```
String str, str1, str2, str3;
int i, j;
```

(a) `str1 = "fantastic";`         (b) `str = "123456";`
    `str3 = " weekend";`            `str2 = "hi";`
    `str = str1;`                     `str += str2;`
    `str += str3;`

(c) `str3 = "waterfall";`
    `j = str3.length();`
    `i = str3.length();`
5. What is the result of each of the following comparisons (true or false)? Use these declarations for each part:

```java
String str = "water";
String str2 = "waterfall";
String str3 = "what";
```

(a) if (str.equals("water")) . . .
(b) if (str3.compareTo(str) < 0) . . .
(c) if (str.compareTo(str3) < 0) . . .
(d) if (str.compareTo(str2) > 0) . . .
(e) if (str2.compareTo(str) > 0) . . .
(f) if (str3.compareTo("where") > 0)

6. Show what is printed by the following section of code:

```java
String str = "another value";
StringBuilder p = new StringBuilder(str);
p.delete(3,7);
System.out.println("p is: " + p);
p.insert(4,"done");
System.out.println("p is: " + p);
p.replace(1,3,"XY");
System.out.println("p is: " + p);
```

7. Show what is printed by the following section of code:

```java
String t = "cannon ball news";
int m,k,j;
k = t.indexOf("all");
m = t.indexOf("all",10);
j = t.indexOf("call",0);
System.out.println("m, k, and j: " + m + " " + k + " " + j);
```

8. For each of the following, show what values are assigned to the variables. For each part, start from the following declaration and initial values:

```java
String str = "good morning";
String str1 = "evening news";
String str2 = "bad";
```

(a) str1 = str.substring(5);          (b) str2 = str1.substring(5);
(c) str1 = str.substring(5,9);        (d) str2 = str1.substring(5,9);

9. For each of the following, show the result of the method call. For each part, start from the following declaration and initial values:

```java
StringBuilder str  = new StringBuilder("your cat is full of fur");
StringBuilder str1 = new StringBuilder("lunchtime aggravation");
StringBuilder str2 = new StringBuilder("half of the apple");
(a) str.replace(5,8,"dog");        (b) str.replace(20,23,"food");
(c) str1.replace(5,9,"room");      (d) str2.replace(12,17,"orange");
```

10. For each of the following, show what is printed. For each part, start from the following declaration and initial values:

```java
StringBuilder str  = new StringBuilder("happy home appliances");
StringBuilder str1 = new StringBuilder("living room refrigerator");
StringBuilder str2 = new StringBuilder("microwave telephone");
String str3;
(a) str.delete(6,10);                       (b) str1.delete(0,11);
   str.insert(6,"workplace");               str1.insert(0,"office");
   System.out.println(str);                  System.out.println(str1);
(c) str2.delete(5,9);                           (d) str1.delete(14, str1.length());
   str3 = str2.substring(10,15);             str1.insert(14,"treat");
   str2.insert(5,str3);                       System.out.println(str1);
   str2.delete(15,20);
   str2.insert(15,"vision");
   System.out.println(str2);
```
11. Show what is printed by the following programs:

(a) 
```java
public class prob8_11a {
    public static void main(String[] args) {
        String str1;
        String str2;
        String str3;
        int len;

        str1 = "first";
        str2 = "alexander";
        str3 = str2;
        len = str3.length();
        str3 = str3 + str1;
        System.out.println(str1 + " " + str2 + " " + str3);
        System.out.println(len);
    }
}
```

(b) 
```java
public class prob8_11b {
    public static void main(String[] args) {
        String str;
        String str1;
        int k, m, n;

        str = "jacksonville fl";
        m = str.length();
        str1 = "here is ";
        str1 += str;
        k = str1.length();
        n = str1.length();
        System.out.println(str + " " + str1);
        System.out.println(k + " " + m + " " + n);
    }
}
```
12. (a) Show what is printed by the following program as it executes. Assume that the set of data read in is the following: Smith  Brown  Jones.

```java
import java.util.Scanner;
public class prob8_12a {
    public static void main(String[] args) {
        String[] part = new String[3];
        String[] title = new String[3];
        String name;
        Scanner kybd = new Scanner(System.in);

        part[0] = "Linda";
        part[1] = "Mary";
        part[2] = "Bill";

        title[0] = "Mr.";
        title[1] = "Ms.";
        title[2] = "Mrs.";

        for (int i = 0; i < 3; i++) {
            name = makename(part[i], title[i], kybd);
            System.out.println(name);
        }
        kybd.close();
    }

    public static String makename(String first, String title, Scanner kybd) {
        String last, whole;

        System.out.print("Enter the last name: ");
        last = kybd.next();

        whole = "";
        whole += title;
        whole += " ";
        whole += first;
        whole += " ";
        whole += last;

        return whole;
    }
}
```

(b) Explain why the formal parameters `first` and `title` are not arrays of strings even though `part` and `title` in the main program are.

Programming Projects

13. Write a method `reverse()` that receives a string `str` as a parameter and returns the characters in `str` in reverse order. Thus, if the value sent to `reverse()` is "I  me ", the method returns " m e I".