Question 1 ................................................................. (4 points)
Write a single Java statement that
(a) [2 points] declares and initializes an array of three floats, all equal to 1.0f.
(b) [2 points] declares and constructs an array of 2 arrays of 3 floats, initially equal to zero.

Question 2 ................................................................. (8 points)
Java has extensive features for handling errors and exceptions.
(a) [2 points] In what ways is a standard Java Error the same as an Exception?
(b) [2 points] Why would you be more likely to catch an Exception?
(c) [2 points] What is special about the standard class RuntimeException?
(d) [2 points] After a try block that constructs and reads a FileInputStream, why should you catch a FileNotFoundException before catching an IOException?
Complete the following methods. Call the first method `sum` in your implementation of the second method `sum`.

```java
/**
 * Returns a new array filled with a specified constant.
 * @param n number of floats (array length).
 * @param x the value with which to fill the array.
 * @return the new filled array.
 */
public static float[] fill(int n, float x) {

}

/**
 * Returns the sum of all values in the specified array.
 */
public static float sum(float[] x) {

}

/**
 * Returns the sum of all values in the specified array.
 */
public static float sum(float[][] x) {

}
```
Question 4 ................................................................. (10 points)
Complete the following method to flip an image upside down. For each image pixel x[i][j], assume that i is the column index and j is the row index. Also assume that every image column contains the same number of pixels.

/**
   * Vertically flips a specified image.
   * @param x the image to be flipped; not modified.
   * @return the vertically flipped image.
   */
public static float[][] flipVertical(float[][] x) {
}

Question 5 ................................................................. (8 points)
Both text and binary formats are used to store scientific data in files.
(a) [2 points] List one advantage of the text format.

(b) [2 points] List one advantage of the binary format.

(c) [2 points] List two standard Java classes for use with text files only.

(d) [2 points] List two standard Java classes for use with binary files only.
Question 6. Consider the classes A and B defined below:

```java
public class A {
    public A(int n) {
        this.n = n;
    }

    private int n;
}

public class B {
    public B() {
    }

    public B(float x) {
        this.x = x;
    }

    private float x;
}
```

(a) [2 points] In the class B, modify the first constructor so that it calls the second constructor, initializing the float to `1.0f`.

(b) [2 points] Modify the class B so that it is a subclass of A.

(c) [2 points] In your modification of B, the second constructor should call the constructor for A with integer value 1.

(d) [2 points] Inheritance is an important feature of object-oriented programming. Why is it important?