

MACS 261J
1st Midterm Exam
February 17, 2012

Name: _____

Question:	1	2	3	4	5	Total
Points:	6	8	6	15	15	50
Score:						

Question 1 (6 points)

Circle and describe all syntax errors in the following program fragment:

```
float value_1;
float value-2 = 2.0;
if (value_1=value_2) {
    System.out.println("equal");
else {
    System.out.println("not equal")
}
```

Question 2 (8 points)

In the Java statement

```
public static final float SQRT_TWO = (float)Math.sqrt(2.0);
```

what is the purpose of

- the keyword `static`?
- the keyword `final`?
- the operator `(float)`?

Which of these if omitted would cause a syntax (compile) error?

Question 3 (6 points)

Consider the following method:

```
public static void mystery(int n) {
    int num = 0;
    while (n>0) {
        int k = n/10*10;
        for (int i=k; i<n; ++i)
            ++num;
        n = k/10;
    }
    System.out.println(num);
}
```

What is printed by `mystery(1)`? By `mystery(123)`? By `mystery(12345)`?

Question 4..... (15 points)

- (a) [5 points] Returns `true`, if `j` is evenly divisible by 2, `k` is evenly divisible by 3, and `j` is evenly divisible by `k`; returns `false`, otherwise.

```
public static boolean divisible(int j, int k) {
```

```
}
```

- (b) [5 points] Returns the smallest of four specified floats.

```
public static float smallest(float a, float b, float c, float d) {
```

```
}
```

- (c) [5 points] Draws a grid of `n` horizontal lines and `n` vertical lines that are evenly spaced and fill a panel with specified width `w` and height `h`.

```
public void drawGrid(Graphics g, int n, int w, int h) {
```

```
}
```

Question 5 (15 points)

Implement all methods for the following classes:

```
/**
 * A waypoint (geographic location) has a name, latitude and longitude.
 */
public class Waypoint {

    /** Constructs a waypoint with specified name and zero lat and long. */
    public Waypoint(String name) {

    }

    /** Sets the location for this waypoint. */
    public void setLocation(double latitude, double longitude) {

    }

    /** Gets the name for this waypoint. */
    public String getName() {

    }

    /** Gets the latitude for this waypoint. */
    public double getLatitude() {

    }

    /** Gets the longitude for this waypoint. */
    public double getLongitude() {

    }

    /**
     * Determines whether this waypoint equals the specified waypoint.
     * Two waypoints are equal if they have the same name and location.
     */
    public boolean equals(Waypoint wp) {

    }
}
```

```

/**
 * Returns a clone of this waypoint with the specified name.
 * The clone has the same lat and long as this waypoint.
 */
public Waypoint clone(String name) {

}

// declare
// private
// fields
// here
}

/**
 * Using the methods defined in the class Waypoint,
 * (1) constructs a waypoint for a location home named "Home",
 * (2) sets the location of the home waypoint,
 * (3) creates a clone of the home waypoint with name "Mines",
 * (4) gets and prints the location of the new waypoint.
 */
public class WaypointDemo {
    public static void main(String[] args) {

}
}

```