Chapter 9 – Objects and Classes

Four questions, 25 points each.

}

1. Design a class based on the following UML Class diagram.

Rectangle	
width: double height: double	The width of this rectangle (default 1). The height of this rectangle (default 1).
Rectangle() Rectangle(width: double, height: double)	Constructs a default rectangle. Constructs a rectangle with the specified width and height.
getArea(): double getPerimeter(): double	Returns the area of this rectangle. Returns the perimeter of this rectangle.

Use the following main method for your program and to get the screenshot of the output.

```
public static void main(String[] args) {
   Rectangle myRectangle = new Rectangle(4, 40);
   System.out.println("The area of a rectangle with width " +
        myRectangle.width + " and height " +
        myRectangle.height + " is " +
        myRectangle.getArea());
   System.out.println("The perimeter of a rectangle is " +
        myRectangle.getPerimeter());

Rectangle yourRectangle = new Rectangle(3.5, 35.9);
   System.out.println("The area of a rectangle with width " +
        yourRectangle.width + " and height " +
        yourRectangle.height + " is " +
        yourRectangle.getArea());
   System.out.println("The perimeter of a rectangle is " +
        yourRectangle.getPerimeter());
}
```

2. Design a Stock class based on the following UML Class diagram. All the data fields and methods are self-explanatory. The method getChangePercent() refers to percentage change from current price to previous closing price.

```
Stock
symbol: String
- name: String
- previousClosingPrice: double
- currentPrice: double
+ Stock()
+ Stock(newSymbol: String, newName: String)
+ Stock(newSymbol: String, newName: String
        newPreviousClosingPrice: double
        newCurrentPrice: double)
+ getChangePercent(): double
+ getSymbol(): String
+ getName(): String
+ getPreviousClosingPrice(): double
+ setPreviousClosingPrice(
        newPreviousClosingPrice: double): void
+ getCurrentPrice(): double
+ setCurrentPrice(
        newCurrentPrice: double): void
```

Use the following main method for your program and to get the screenshot of the output.

```
public static void main(String[] args) {
   Stock stock = new Stock("SUNW", "Sun MicroSystems Inc.");
   stock.setPreviousClosingPrice(100);

// Set current price
   stock.setCurrentPrice(90);

// Display stock info
   System.out.println("Previous Closing Price: " +
      stock.getPreviousClosingPrice());
   System.out.println("Current Price: " +
      stock.getCurrentPrice());
   System.out.println("Price Change: " +
      stock.getChangePercent() * 100 + "%");
}
```

Sample Output for the above main method:

Previous Closing Price: 100.0

Current Price: 90.0 Price Change: -10.0%

3. Write a program that creates a Date object, sets its elapsed time to 1000000000, 10000000000, and 100000000000, and displays the date and time using the toString() method, respectively.

4. Write a program that creates a Random object with seed 100 and displays the first 10 random integers between 50 and 100 (exclusive).