Faculty of Arts & Sciences
Department of Computer Science
CMPS 200—Introduction to Programming
Assignment 5 – Due: Oct. 19, 2015 @ 2:00pm

Exercises

1. Write a static method `parseTime` that takes an integer parameter depicting the time in military format (e.g., `221040` means that the hour is 22, the minute is 10, and the second is 40) and extracts and prints the hours, the minutes, and seconds as follows:

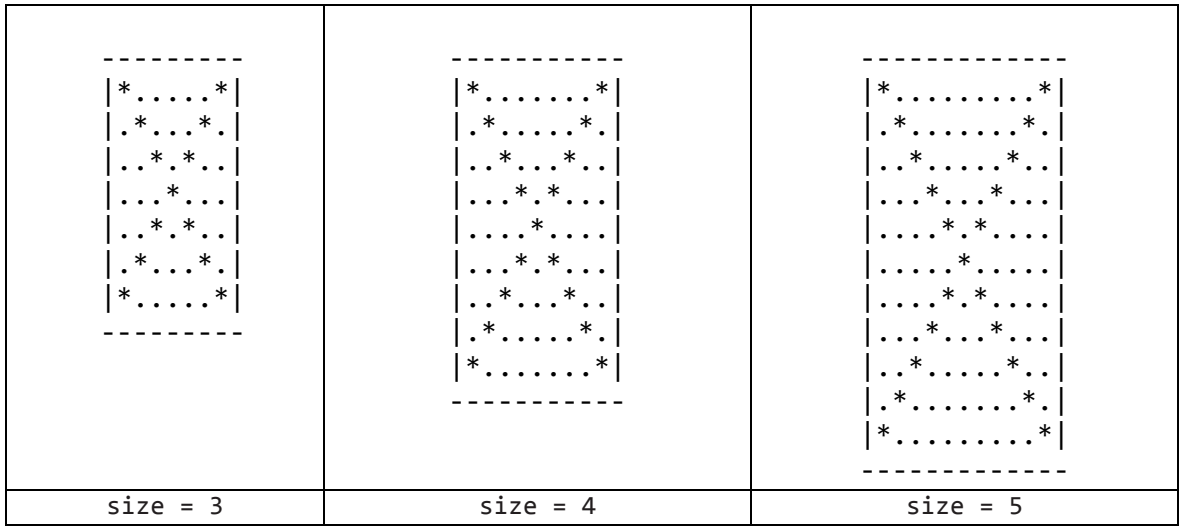
   ```
   Hours: 22, Minutes: 45, Seconds: 59
   ```

   The method then calls another static method (that you must create) `timeInSeconds` that takes three integer parameters depicting the hours, minutes and seconds, and returns an integer variable that represents the time converted to seconds. The method `parseTime` then uses the returned output from `timeInSeconds` to print the following:

   ```
   Time in seconds: 81959
   ```

   Write a program **`Time.java`** that calls `parseTime` for different input military time. Assume that the time in military format is always 6 digits long and all the values are legal, i.e. the hour cannot be greater than 24, and the minutes and seconds cannot be greater than 59. **Note**: the number must not start with a leading zero.

2. Write a method `drawShape` that takes three parameters (`int size`, `String diagonal`, and `String inner`), and draws the shape shown below depending on the values of `size`, `diagonal` and `inner`. In the figure below, `diagonal` is "*", `inner` is ".", and `size` is 3, 4 and 5 respectively. Then, write a program **`Shape.java`** that calls the method `drawShape` for different values of `size`, `diagonal` and `inner`.



size = 3	size = 4	size = 5

3. Write method `displayPattern` that takes as argument the variable ***n*** and displays the following pattern using for loop(s):

```
12345678987654321
 234567898765432
  3456789876543
   45678987654
    567898765
     6789876
      78987
       898
        9
```

Write a program **`Pattern.java`** that calls the method `displayPattern` for **1** ≤ ***n*** ≤ **9**.

4. The following geometric series $\sum_{i=0}^{n}(\frac{1}{2})^i = 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \cdots + \frac{1}{(2)^n}$ converges to the value of 2.0 (i.e., $\sum_{i=0}^{n}(\frac{1}{2})^i = 2.0$) for a certain value of n. Your task is to find the smallest value of n that makes the above series converge to 2.0.
   To solve this problem, first you must write a method `computeSum,` which takes the variable n as parameter and returns the sum of the series based on the aforementioned equation.
   You must then use this method in the program, **`Series.java,`** to find the smallest value of n that makes the sum of the series equals to 2.0.

Submission Instructions and Guidlines

- Your submission must consist of a single zip folder that contains the following `.java` files only: **`Time.java, Shape.java, Pattern.java`**, and **`Series.java`**. No additional files should exist in the .zip folder.
- Give meaningful names to your methods and variables in your code.
- Include a comment at the beginning of your program with basic information about yourself and a description of the program. Include also a comment at the start of each method.
- The name of the zip file must adhere to the following naming convention `s#_A$_`*`netid`*, where # stands for your section number (between 1 and 12), *`netid`* stands for your AUBnet user name, and $ stands for the assignment number. For example, if your AUBnetid is abc65, you are in section 4 and are submitting assignment 5, you should submit the following file: `s4_A5_abc65.zip`. The zip files will be processed automatically so please make sure you use this naming convention.
- **Failing to follow these guidelines will result in deducting marks form your grade.**