ECSU-NAM 2OO8 Student Research Institute in Computational Science-Scientific Visualization

More Exercises

1. Write and run a Java program that initializes a string variable with your first name and then prints it:
   a. On three separate lines.
   b. Three times on a single line separated by spaces.

2. Write and run a Java program that prompts the user for his/her last name and first name separately and then prints a greeting like this (with inputs: O'Connor and Sandra):
   `Hello, Sandra O'Connor.`

3. Write and run a Java program that initializes an integer variable `n` with the value 5814 and then uses the quotient and remainder operators to extract and print each digit of `n`. The output should look like this:
   ```
   n = 5814
   The digits of n are: 5, 8, 1, and 4.
   ```
   Hint: Use `n/1000` to extract the thousands digit from `n`, and use `n = n%1000` to remove the thousands digit from `n`.

4. It has been observed that crickets tend to chirp in the summer at a rate that is related to the temperature by the formula *T = (c + 40)/10*, where c is the number of chirps per minute and T is the temperature in Fahrenheit degrees. Write and run a Java program that inputs the number of chirps per minute and outputs the temperature in decimal form.

5. Write and run a Java program that requests a person's *First*, *Middle* and *Last* and then prints it in the form `Last, First M.`, where `"M."` is the person's middle initial.
   For example with inputs of William Jefferson Clinton, the output is
   `Clinton, William J.`

6. Write and run a Java program that generates a random double, determines which quintile of the unit interval it is in and reports it. A *quintile* is one of five equal sized pieces of the whole. The quintiles of the unit interval are 0 to 1/5, 1/5 to 2/5, 2/5 to 3/5, 3/5 to 4/5 and 4/5 to 1. Example: *The number 0.1 belongs to the first quintile.*

7. Write and run a Java program that generates a random year between 1800 and 2000, prints it and reports whether it is a leap year. A leap year is a year that is greater than 1584 that is either divisible by 400 or divisible by 4 but not 100. To generate an integer in the range 1800 and 2000: use *year = 1800 + random.nextInt(2000 - 1800)*

8. Write and run a Java program that tests the summation formula

$$\sum_{i=1}^{n} i^3 = \frac{n^2(n+1)^2}{4}$$

Generate a random integer n in the range 0 to 100, manually sum up the cubes of the integers from 1 to n, computer the value of the expression on the right, and then print both values to see that they agree.