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Assignment #02

5/22/17

Problem 1

Description: A program that prompts for the user's first and last name, generates a random number between 10 and 99, then creates a username with the following format: first letter of first name plus first five letters of last name plus random number.

Logic: Scan in the user's first and last name and make them lowercase, create the random number using the math class, then create the username by applying the substring method. Print the username and close the scanner.

Input/Output:

Run 1 - {Input Given: "jonah", "largen"} {Expected Output: "jlarge##"} {Actual Output: "jlarge50"} {Successful Output}. The output is as follows.

```
<terminated> Problem1 (1) [Java Application] C:\Program Files\Java\jre1.8.0_121\bin\javaw.exe (May 22, 2017, 5:01:28 PM)
Enter your first name:
jonah
Enter your last name:
largen
jlarge50
```

Run 2 - {Input Given: "John", "Smith"} {Expected Output: "jsmith##"} {Actual Output: "jsmith55"} {Successful Output}. The output is as follows.

```
<terminated> Problem1 (1) [Java Application] C:\Program Files\Java\jre1.8.0_121\bin\javaw.exe (May 22, 2017, 5:02:05 PM)
Enter your first name:
John
Enter your last name:
Smith
jsmith55
```

Conclusion: The code works as expected and prints out the usernames.

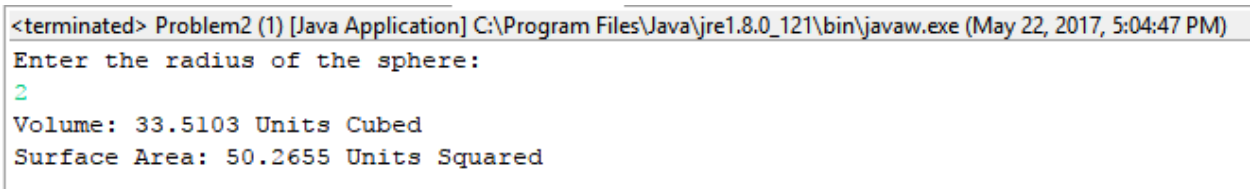
Problem 2

Description: Read in the radius of a sphere and print out its volume and surface area

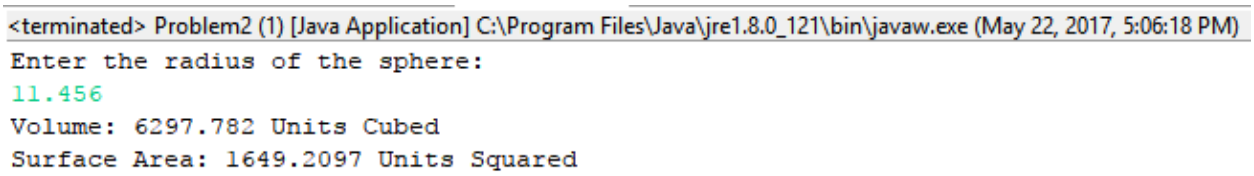
Logic: Scan in the radius of the sphere as a double. Use the given formulas to solve for volume and surface area in terms of radius. Print out both values using a decimal format to 4 places after the decimal, then close the scanner.

Input/Output:

Run 1 - {Input Given: 2} {Expected Output: 33.5103 Volume, 50.2655 Surface Area} {Actual Output: 33.5103 Volume, 50.2655 Surface Area} {Successful Output}. The output is as follows.



Run 2 - {Input Given: 11.456} {Expected Output: 6297.7820 Volume, 1649.2097 Surface Area} {Actual Output: 6297.782 Volume, 1649.2097 Surface Area} {Successful Output}. The output is as follows.



Conclusion: The code works as expected and prints the volume and surface area. Since the Volume of run 2 has a ‘0’ as the fourth digit after the decimal, it is simply left out by the decimal formatter.

Problem 3

Description: A program that reads in the 3 sides of a triangle and computes the area using Heron's formula.

Logic: Scan in the three sides as a double, then use those numbers to solve for half of the perimeter. Use the power function to implement Heron's formula and solve for the area. Print out the area using a decimal format to 3 places after the decimal, then close the scanner.

Input/Output:

Run 1 - {Input Given: 3, 4, 5} {Expected Output: 6 Area} {Actual Output: 6 Area} {Successful Output}. The output is as follows.

```
<terminated> Problem3 (1) [Java Application] C:\Program Files\Java\jre1.8.0_121\bin\javaw.exe (May 22, 2017, 5:10:33 PM)
Enter the length of the first side:
3
Enter the length of the second side:
4
Enter the length of the third side:
5
Area: 6 Units Squared
```

Run 2 - {Input Given: 3.5, 5, 7.5} {Expected Output: 7.348 Area} {Actual Output: 7.348 Area} {Successful Output}. The output is as follows.

```
<terminated> Problem3 (1) [Java Application] C:\Program Files\Java\jre1.8.0_121\bin\javaw.exe (May 22, 2017, 5:11:43 PM)
Enter the length of the first side:
3.5
Enter the length of the second side:
5
Enter the length of the third side:
7.5
Area: 7.348 Units Squared
```

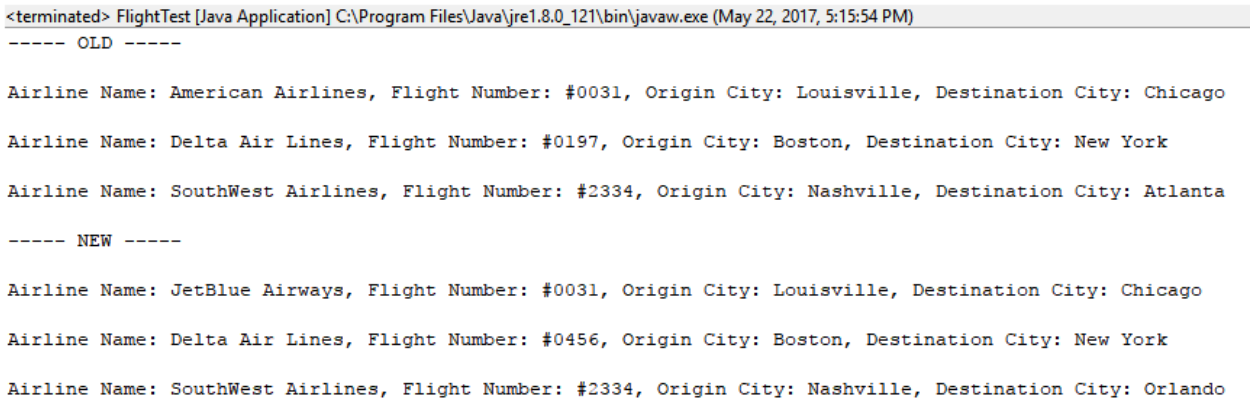
Conclusion: The code works and correctly prints the area of the triangle. Since the Area of run 1 has a '0' as the first through third digit after the decimal, it is simply left out by the decimal formatter.

Problem 4

Description: A Flight class that contains the flights airline name, number, and origin and destination city. A driver class is made to create test flights and change their values.

Logic: Create the instance variables and constructor of the Flight class, then the getters and setters for these variables. The constructor accepts all four values at once, and then the toString method is overwritten to print out the variables in another format. In the driver class the instances are then created using the constructor, the values are changed with the setters, and then the values are printed, both before and after the values were changed.

Input/Output: There is no input for this problem. The output is as follows.



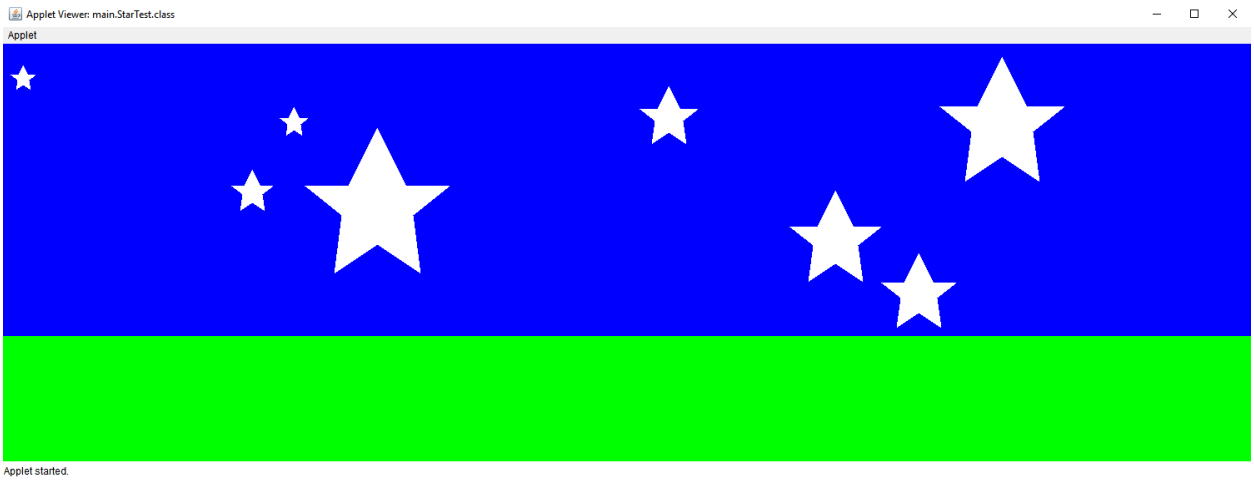
Conclusion: The code works and prints the flight, changes a value from each, then reprints the value again.

Problem 5

Description: Create a star class using the width, x, and y value as the instance variables, where x and y are the location of the top point of the star. Use a driver class to create some stars in the sky.

Logic: Create the instance variables and constructor of the star class, and then the getters and setters for these variables. The constructor accepts all three values at once. In the driver class fill rectangles that makes the sky and grass are placed. 8 Stars are created using the full constructor, placed in an array, then looped through. During each instance of the loop the current star's variables are taken and used to create an array of points representing a star. A fill polygon is then made using these points.

Input/Output: There is no input. The output is as follows.



Conclusion: The code works as expected and prints the stars in the sky.