Assignement 7 - Examples

CS1400 Summer 2011

Learning Objectives:

- Practicing static method calls and the use of static fields
- Increasing your familiarity with the Math and String classes from the Java API
- Formulating algorithms

Description:

Create a project called **A7_YourName** with two java files called **Examples.java** and **ExamplesMenu.java**

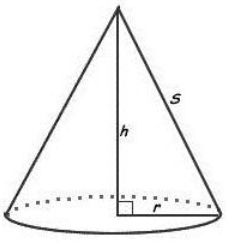
Examples.java:

Implement the class as described in the UML class diagram below. Do not add, remove or modify members of the class

Examples
- euroConversionRate
+ createPalindrome (word : String) + displayConeInfo (hight: Double, radius : Double) + convertToEuro (dollarAmount : Double) : Double + setEuroConversionRate (newRate : Double)

All members in the Exercises class are underlined. This indicates that all fields and methods of this class are static. This works well because none of the methods relies on data from a specific instance.
Hint1: all methods and the field need to be declared with the keyword static.
Hint2: all methods and the field need to be called on the type (ClassName + dot operator + field or method name)

Ad displayConeInfo:
displayConeInfo receives the height of the cone and the radius of the base as arguments.
It takes this information and uses methods of the Math class to calculate and display the surface area and the volume.



surface area:

$$SA = \pi r s + \pi r^2$$

volume:

$$V = \frac{1}{3} \pi r^2 h$$

Tip: check out the methods pow, sqrt, and hypot – and yes, you'll need PI
http://download.oracle.com/javase/6/docs/api/java/lang/Math.html

Ad euroConversionRate
This private static field reflects the current conversion rate from dollars to Euros. It is initialized with 0.69 (for 1 dollar you get 0.69 Euros)

Sample Output:

```
p .. create palindrome
c .. cone info
e .. Euro conversion
s .. set new Euro conversion rate
your choice: p
studentneduts
Ï
p .. create palindrome
c .. cone info
e .. Euro conversion
s .. set new Euro conversion rate
your choice: c
suface area: 642.2
volume: 314.2
Ï
p .. create palindrome
c .. cone info
e .. Euro conversion
s .. set new Euro conversion rate
your choice: e
For $100 get 67.62 Euros
Ï
p .. create palindrome
c .. cone info
e .. Euro conversion
s .. set new Euro conversion rate
your choice: s
new euro conversion rate: 0.83
Ï
p .. create palindrome
c .. cone info
e .. Euro conversion
s .. set new Euro conversion rate
your choice: e
For $100 get 81.34 Euros
Ï
p .. create palindrome
c .. cone info
e .. Euro conversion
s .. set new Euro conversion rate
your choice: x
```

Turning in:

Zip up your project and rename the file **A7_*YourName*.zip** . Turn it in via Virtual Campus.

Maximum Points: 30

Ad convertToEuro:
This method receives an amount in Dollars and returns the amount in Euro. However, the exchange booth charges a flat fee of $2 that has to be deducted from the amount before the rest gets converted.

Ad setEuroConversionRate
This is the set method that allows updating the euroConversionRate. Ensure that the argument passed is greater 0 before you assign it to the field. If the argument is less or equal to 0 ignore it and leave the field value unchanged

Ad createPalindrome:
Turn the word received as an argument into a palindrome. You do that by adding the letters in reversed order at the end of the word. Make sure the last letter (in the center) appears only once.
Examples: dog => dogod
Java => JavavaJ
student => studentneduts

Do not save the palindrome in a string – even not temporarily. I want you to print it out directly.

ExamplesMenu.java:

- Inside the main method create two instance of type Scanner: doubleInput and stringInput (if you use the same scanner instance alternating for String and double input it can cause difficulties)
- Declare a local variable of type char named choice
- Inside a do-while loop do the following:
  - Display the menu as shown in the output (it has to be a multi-line menu)
  - Immediately below the menu add the prompt and read in the user choice as a character
    Tip: to read in a character you can use the nextLine method in combination with charAt
  - In a switch statement check for the character the user entered
    - If it was a p or P call the createPalindrome method
      you may 'hard-code' the word "student" as an argument
    - If it was a c or C call the displayConeInfo method
      you may hard-code the values 10 for height and 3 for radius
    - If it was an e or E call the convertToEuro method
      you may hard-code 100 as the dollarAmount.
      convertToEuro returns the euro-amount. Make sure to print out a message that lets the user know how many Euros he will get for his dollars.
    - If it was s or S call the method setEuroConversionRate
      Read in the new conversion rate from the user and pass it as an argument to setEuroConversionRate
- Repeat the do-while loop until an invalid choice is entered.