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# University of Colorado at Colorado Springs

## Home Work Assignment 4 Out 10/21/2019, Due 11/04/2019

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### 1 Pentagon (20 pts code + 5 pts pseudocode = 25 pts)

Write a program `Pentagon.java` that prompts the user to enter  $s$ , the length of a side of a pentagon, and computes the area of the pentagon using the following formula:

$$Area = \frac{5 \times s^2}{4 \times \tan\left(\frac{\pi}{5}\right)}, \quad (1)$$

where  $s$  is the user input. If the user input is a negative number or 0, use `System.exit(1)`; to terminate the program. Please display the result with **1 decimal point**. Here is a sample run:

```
Enter the length of a side of a pentagon: 5.5
The area of the pentagon is 52.0
```

### 2 License Plates (25 pts code + 5 pts pseudocode = 30 pts)

A state's license plate numbers are made up of: 3 upper case letters, a dash (-), and 3 digits. Please write a program `Plates.java` that displays a **randomly generated** license plate number using the format above. An output may look like this:

```
Your license plate is: NTA-170
```

### 3 Printing Greek (30 pts code + 5 pts pseudocode = 35 pts)

Write a Java program `Greek.java` that prints what you see in the figure on next page. It simply shows Greek uppercase letters and their Unicode in the first two columns, and Greek lowercase letters and their Unicode in the last two columns. Use tabs to separate the four columns. Please **use a loop to implement this**. Note that to display non-English characters, you need to go to Eclipse, Edit → Set Encoding, and choose UTF-8.

A	\u0391	α	\u03B1
B	\u0392	β	\u03B2
Γ	\u0393	γ	\u03B3
Δ	\u0394	δ	\u03B4
E	\u0395	ε	\u03B5
Z	\u0396	ζ	\u03B6
H	\u0397	η	\u03B7
θ	\u0398	θ	\u03B8
I	\u0399	ι	\u03B9
K	\u039A	κ	\u03BA
Λ	\u039B	λ	\u03BB
M	\u039C	μ	\u03BC
N	\u039D	ν	\u03BD
Ξ	\u039E	ξ	\u03BE
O	\u039F	ο	\u03BF
Π	\u03A0	π	\u03C0
P	\u03A1	ρ	\u03C1
Σ	\u03A3	σ	\u03C3
T	\u03A4	τ	\u03C4
Υ	\u03A5	υ	\u03C5
Φ	\u03A6	φ	\u03C6
X	\u03A7	χ	\u03C7
Ψ	\u03A8	ψ	\u03C8
Ω	\u03A9	ω	\u03C9

Figure 1: Greek letters

Hint #1: First, in `System.out.format()`, `%X` can print a number in its base-16 format, e.g., 913 in base 10 will be printed as 391, its equivalent form in base 16. Second, pre-fix `0x` indicates that a number is hexadecimal, e.g., `0x391` is a hexadecimal number, and it is 913 in base 10. As another example, in `int noBytes = 0x400`; the variable `noBytes`'s value is 1024 in decimal. Please use these information to figure out how to print the Greek letters.

Hint #2: In Figure 1, notice two Unicodes have been skipped (between `P` and `Σ`, `ρ` and `σ`).

## Submission

Please save your programs in three Java files, each containing **pseudocode**. You may include your pseudocode in a block comment using `/* ... */`. **10 pts are given to your coding style** (comments – header and in-code comments: up to 4 pts, naming conventions: up to 3 pts, proper

indentation/spacing: up to 3 pts). We will run each program several times with our input and verify that the results are correct.

Please place your files in a folder called **hw4-firstname-lastname** and zip it. The zipped file should be named **hw4-firstname-lastname.zip**. Please submit the zipped file to Canvas by the due date.