COMP 2243 Fall 2022 Assignment 8 Total 20 points

Do not use global variables. Do not write OOP programs.

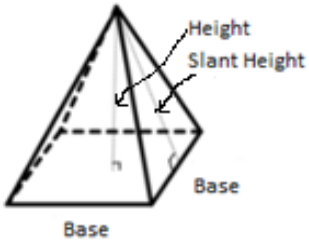
1. Enhance the "**Regular Pyramid**" program you have completed in Assignment 3.

- Step 1: Write four methods as follows:
  - The first method takes the **base** and **height** as the parameters, then calculates and returns the **slant height**.
  - The second method takes the **base** and **height** as the parameters, then calculates and returns the volume.
  - The third method takes the **base** and **slant height** as the parameters, then calculates and returns the total surface area.
  - The fourth method takes the **base, height, slant height, volume**, and **total surface area** as the parameters, then prints the result.

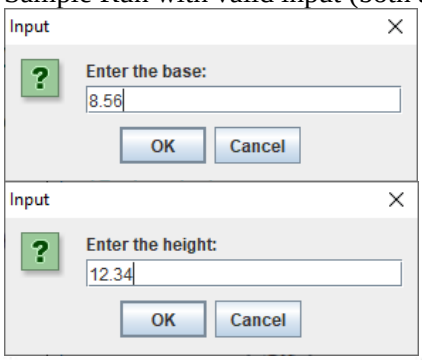
- Step 2: In the main method, prompt the user to enter the base and height, then call the first three methods to get the results (slant height, total surface area and volume) and call the last method to print the result.
  - The user inputs need to be validated.

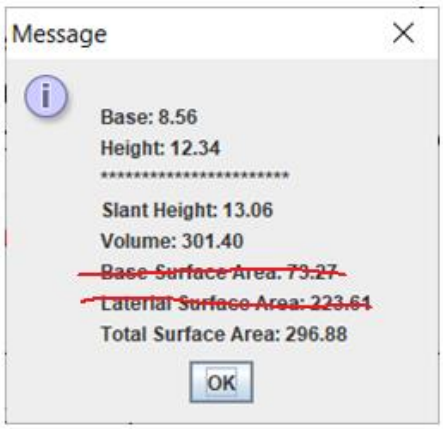
- Step 3: Use a loop to continue to run the program until the user choose not to. (**Extra Credit: 2 points**)

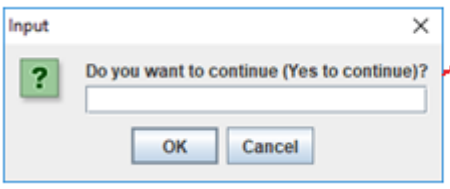
Sample Run (It is **not** required to use JOptoinPane.)



Sample Run with valid input (both are greater than 0)







Extra Credit

2. Enhance the **Miles Per Gallon** program you have completed in Assignment 3.

- Step 1: Write the first method definition:

  - It takes the **miles-driven** and **gallons-used** as the parameters, then calculates and returns the **miles-per-gallon**.

- Step 2: Write the second method definition:

  - It takes the **vehicle-model, miles-driven, gallons-used,** and **miles-per-gallon** as the parameters, then print the model, miles-driven, gallons-used, and miles-per-gallon.

  - If the MPS is more than 24, it prints a message indicating that it is above national average. Otherwise, prints a message indicating that it is equal to or below national average

- Step 3: In the main method, the program does the following:

  - It prompts the user to enter the **vehicle-model**, **miles-driven** and **gallons-used**.

  - It calls the first method to get the **miles-per-gallon** if the input is valid. Otherwise, prints an error message.

  - It calls the second method to print the result.

  - The program repeatedly executes with a loop until the user choose not to. Once the loop is ended, it prints the average MPG. [**Extra Credit: 3 points**]

Sample Run

```
Enter the vehicle model (Enter Quit to end the program) : F-150
Enter the number of miles driven: 123.45
Enter the gallons of gas used: 6.5
Model: F-150
Miles Driven: 123.45
Gallons of Gas: 6.5

MPG: 18.99
The car's MPG is below the national average.
```

```
Enter the vehicle model (Enter Quit to end the program) : Camry
Enter the number of miles driven: 100
Enter the gallons of gas used: -3.1

Invalid input. The values should be greater than zero.

Enter the vehicle model (Enter Quit to end the program) : Camry
Enter the number of miles driven: 100
Enter the gallons of gas used: 3.1
Model: Camry
Miles Driven: 100.0
Gallons of Gas: 3.1

MPG: 32.26
The car's MPG is above the national average.

Enter the vehicle model (Enter Quit to end the program) : Quit

Average MGP: 23.28
```

Extra Credit

Due: Wednesday, 10/26/22

- To receive full credit, the assignment must be submitted by the due date.
- Late submissions will incur a penalty of 5% per day.
- Upload the source code files to D2L.

Style, form, documentation, naming convention, and more

Each program should have a file header section. /* * Author: Your name * Date: Date of completion * Assignment: Assignment # NameOfSourceCode.java * Description: The program description */	Up to 5% deduction
Each program should be written with the appropriate form and style. Use indentation, blank line, and comments to make the source code easy to read.	Up to 5% deduction
Use Java naming convention and meaningful names to name the classes, methods, variables, constants, and other identifiers in the programs.	Up to 5% deduction
Format the output appropriately	Up to 5% deduction