BYU IDAHO CSE 111 | Programming with Functions ☾

01 Prove Milestone: Review Python

Purpose

Prove that you can write a simple Python program that gets input from a user, performs arithmetic, and displays output for the user to see.

Problem Statement

The size of a car tire in the United States is represented with three numbers like this: 205/60R15. The first number is the width of the tire in millimeters. The second number is the aspect ratio. The third number is the diameter in inches of the wheel that the tire fits. The volume of space inside a tire can be approximated with this formula:

$$v = \frac{\pi w^2 a \left(w a + 2{,}540\, d \right)}{10{,}000{,}000{,}000}$$

- v is the volume in liters,
- π is the constant PI which is the ratio of the circumference of a circle divided by its diameter (use `math.pi`),
- w is the width of the tire in millimeters,
- a is the aspect ratio of the tire, and
- d is the diameter of the wheel in inches.

Assignment

Write a Python program named `tire_volume.py` that reads from the keyboard the three numbers for a tire and computes and outputs the volume of space inside that tire.

Helpful Documentation

- The prepare content for this lesson explains how to write code to do the following:
  - Get input from a user
  - Convert user input from a string to a number
  - Calculate results
  - Display results to the user
- The Python `math` module contains mathematical constants and functions including `math.pi`.
- This short video (10 minutes) shows a BYU-Idaho faculty member solving a problem that is similar to this prove assignment.

Testing Procedure

Verify that your program works correctly by following each step in this testing procedure:

1. Run your program using the input shown in the sample run section below. Ensure that your program's output matches the sample run output.

2. Run your program using these values: 205, 60, 15 and verify that your program outputs 39.92 liters for the volume.

Sample Run

```
> python tire_volume.py
Enter the width of the tire in mm (ex 205): 185
Enter the aspect ratio of the tire (ex 60): 50
Enter the diameter of the wheel in inches (ex 15): 14

The approximate volume is 24.09 liters
```

Submission

On or before the due date, return to I-Learn and report your progress on this milestone.