

Lab 2: Pizza Pi – Selection

Lab Assignment for PROG1205 – Intro to Programming

Prior to attempting this problem, you should have done the following:

1. Read the assigned textbook readings for weeks 1, 2, 3 and 4.
2. Viewed the Control Structures - Selection/Decisions videos from week 4 and completed the associated Pre-Class Activity.

General Requirements

1. This lab assignment is to be completed **individually**. Group submissions will not be considered.
2. Analyze the problem, design a documented plan (i.e. flowchart or pseudo-code), code and test a solution **following the step-by-step approach** presented in this course.
3. Submit your solution and plan to the appropriate assignment folder on DC Connect **by the due date provided**.
4. Your instructor will assign a grade and post feedback on your submission to DC Connect.

Program Requirements

For this lab you will create a simple Python application that will calculate the number of slices that a pizza of any size can be divided into. This application will determine the number of slices to cut a pizza in based on its diameter.

This application should only accept numeric diameters in the range of 8" to 24" inclusive. When the diameter entered is outside of that range send an appropriate input error message then end the application. Unlike the prior lab, entering invalid data should not crash the application. Only after a valid diameter is entered should processing continue on to determine the number of slices to cut the pizza into and then calculate the area of each slice. After a successful calculation, display the number of slices and the area of each slice for the pizza diameter that was entered. Below is an example of what the program output should look like under two different conditions:

Valid entry:

```
Please enter the diameter of your pizza: 15

A 15" pizza will yield 10 slices.
Each slice will have an area of 17.67 square inches.

Press Enter to end this application...
```

Invalid entry:

```
Please enter the diameter of your pizza: 7.5
ENTRY ERROR
Pizza must have a diameter in the range of 8" to 24" inclusive!
Please try again.

Press Enter to end this application...
```

Detailed requirements follow on the next page.

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Detailed requirements:

1. Prompt the user to enter the diameter of a pizza in inches. Pizza diameters can be entered as real numbers. Ensure that the user input is numeric using “try ... except” or other means.
2. When the user input is numeric, use a compound condition test to check that the diameter entered is within the range of 8” to 24” inclusive.
3. When the diameter entered is not numeric (i.e. cannot be “parsed” into a usable numeric value), display a message indicating the nature of the problem. When the diameter entered is numeric but outside of the allowable range, display an error message indicating that the input must be between 8” and 24”. Do not allow any processing to continue if the user input is not a valid diameter.
4. When the diameter entered is good, determine the number of slices to cut the pizza in using an “if ... else if” decision structure based on the following:
 - Diameters of 8” to < 12” cut in six slices.
 - Diameters of 12” to < 14” cut in 8 slices.
 - Diameters of 14” to < 16” cut in 10 slices.
 - Diameters of 16” to < 20” cut in 12 slices.
 - Diameters of 20” to 24” cut in 16 slices.
5. Calculate the area of the pizza in question, and then calculate the area of each slice. It will make sense to utilize Python’s math class as part of this process.
6. Display the final result as a concatenated string message including the original pizza diameter in inches and the number of slices, as a whole number, to be cut from that pizza as well as the area of each slice as a real number rounded to two decimal places. The format should match the example provided as closely as possible.
7. Prompt the user to press Enter to end the application and end the application when the user presses Enter.
8. Additional Requirement: With this version, you must ensure that the number of slices is displayed and held as a whole number only. In other words, you must use a whole number data type to store the number of slices for display; you cannot use a real number data type.

Style Guide

To be eligible for full marks on this or any lab in this course your application must conform to the requirements as outlined above as well as our prescribed style guide, in this case making sure to observe the PEP8 naming conventions for Python as well as appropriate and complete program documentation.

Development Hint:

You may be tempted to utilize parts of your Lab 1 code to use as a starting point for this project. Be careful because there to be some usable aspects, but also a lot of code that is no longer valid for this lab. It is strongly recommended that you code this lab following the “from plan to program” process from the beginning rather than trying to modify Lab 1.