

Program 1 - a Mulch Delivery Business

Purpose: To learn how to write and test a simple Python program.

Deliverables: The mulch.py program and screenshots of test case execution.

Due: Friday September, 16 at End of Day

Problem: You provide a mulch delivery service to the local area. You will charge for the mulch based on three factors:

1. The cubic yards of mulch needed
2. The distance that you have to travel to deliver the mulch
3. The sales tax due on the cost of the mulch

Mulch:

The unit of measurement for mulch is a cubic yard (3 ft x 3 ft x 3 ft). The price of the mulch is as follows:

Cubic yards	Price per cubic yard
≤ 5	\$36 per cubic yard (minimum order is 3 yards)
$> 5 \text{ and } \leq 10$	\$36 per cubic yard for the first 5 cubic yards plus \$33 per cubic yard for each cubic yard over 5
> 10	\$36 per cubic yard for the first 5 cubic yards plus \$33 per cubic yard for each cubic yard over 5 up to 10 plus \$30 per cubic yard for each cubic yard over 10

How do you calculate cubic yards?

$$(\text{length in feet} \times \text{width in feet} \times (\text{depth in inches}/12)) / 27$$

For example, a planting bed that is 25 feet long by 8 feet wide that requires 4 inches of mulch requires 2.47 cubic yards: $(25 \times 8 \times (4/12)) / 27$

Distance:

Delivery charge is \$4.25 per mile. Minimum delivery charge is \$35. This pays maintenance costs of your delivery truck and driver.

Total Cost:

Total cost is the sum of the cost of the mulch, the cost of delivery and sales tax of 7% applied to cost of the mulch only.

Run all the test cases documented below and take a screenshot of each test case execution.

An example run of the program is shown below. User input is shown in red.

Mulch Cost Calculator

=====

Enter the length of the planting bed, in feet: **10**

Enter the width of the planting bed, in feet: **3**

Enter the desired depth of mulch, in inches: **4**

Total much required is approximately 1 cubic yards.

The minimum mulch order is 3 cubic yards.

Enter your distance from Naperville, IL, in miles: **9**

Cost for 3 cubic yards of mulch

=====

Mulch: \$	108.00
Delivery charge: \$	38.25
Sales tax: \$	7.56
Total cost: \$	153.81

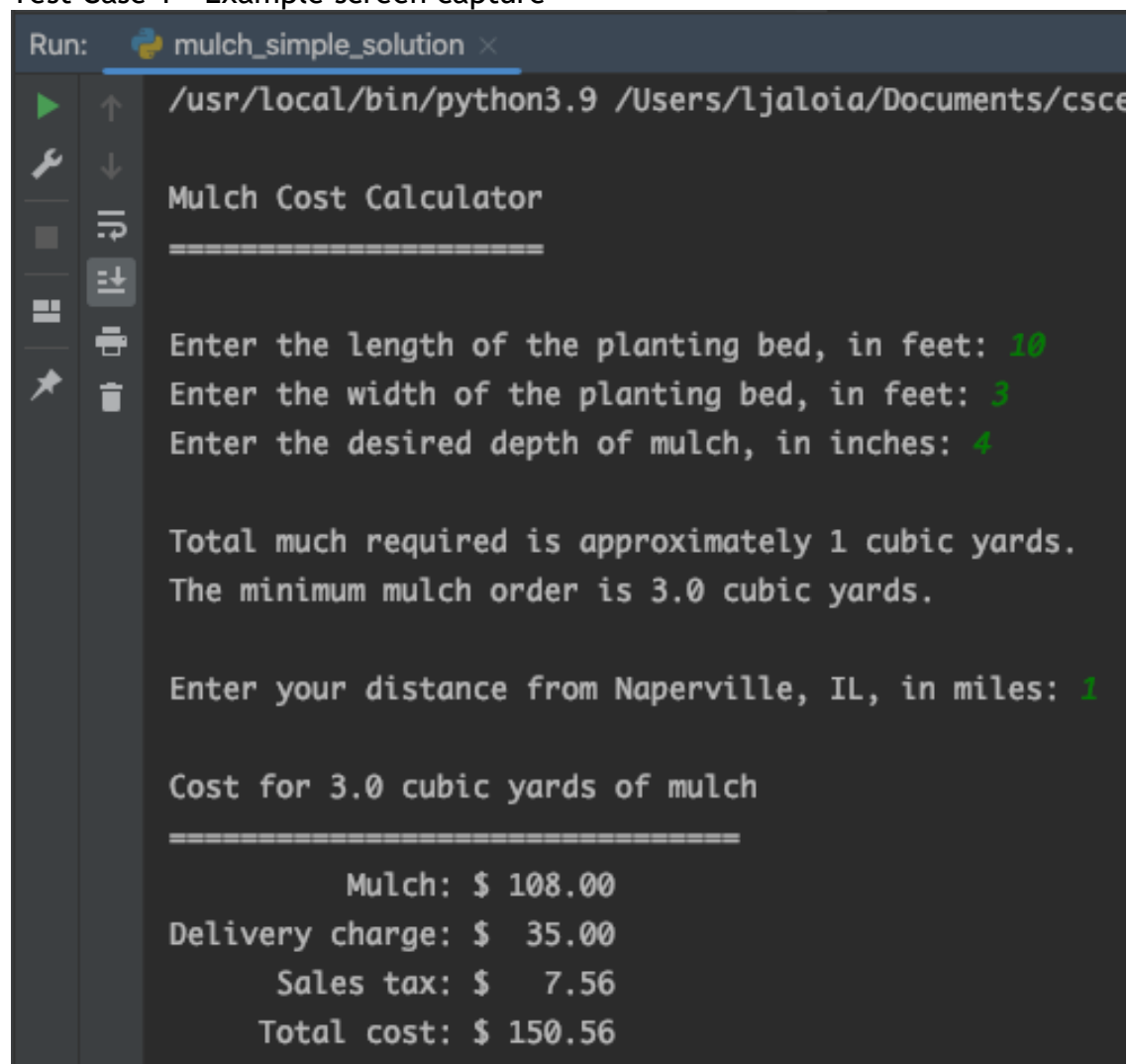
Important Notes:

1. Name your program mulch.py
2. Put your name in the module docstring at the top of your program file.
3. Use the provided flowcharts as a guide to write your code.
4. Display an opening message / title as shown in the example below.
5. Prompt for the length, the width, and the depth in inches of the planting bed.
6. You can assume that the planting bed dimensions, and the distance will all be entered as integers. You can also assume that none of the inputs will be zero, negative, or contain non-numeric symbols.
7. Compute the cubic yards of mulch required and round up to the next integer value.
8. The minimum cubic yards per order is 3 (see the program1_flowchart.pdf)
9. Prompt for the distance to travel to deliver the mulch.
10. Display a message that shows the total cost for the mulch that you will deliver.
11. Use named constants, as appropriate, instead of magic numbers.
12. Use the input prompts as shown in the example below.
13. Use the output strings and formatting as shown in the example below.
14. The total cost may contain a decimal point. Always display monetary amounts with exactly two places after the decimal. Use a dollar sign (\$) in your answer to indicate units.
15. Format your source code.
16. Attach your mulch.py program and PDF containing screenshots of your program's output for each of the test cases (details provided below). Label each screenshot with the test case number.

Test Case Details:

- Test your program by running 7 times using the input values provided in the test cases below.
- Use the input values provided (values in red) for each test case. The output of your program should match the output shown for each test case.
- Take a screenshot of each test case and paste it into a Word document named test_cases.docx. Use one Word document for all 7 screenshots.
- Below are examples of the screenshots that you need to turn in.
- Make sure all screenshots are readable
- Save the Word document in PDF format and submit it.

Test Case 1 - Example screen capture



```
Run: mulch_simple_solution x
/usr/local/bin/python3.9 /Users/ljaloia/Documents/csce

Mulch Cost Calculator
=====

Enter the length of the planting bed, in feet: 10
Enter the width of the planting bed, in feet: 3
Enter the desired depth of mulch, in inches: 4

Total much required is approximately 1 cubic yards.
The minimum mulch order is 3.0 cubic yards.

Enter your distance from Naperville, IL, in miles: 1

Cost for 3.0 cubic yards of mulch
=====

      Mulch: $ 108.00
Delivery charge: $ 35.00
      Sales tax: $ 7.56
Total cost: $ 150.56
```

Test Case 1: Test when cubic yards required is less than 3

Mulch Cost Calculator

=====

Enter the length of the planting bed, in feet: 10

Enter the width of the planting bed, in feet: 3

Enter the desired depth of mulch, in inches: 4

Total much required is approximately 1 cubic yards.

The minimum mulch order is 3 cubic yards.

Enter your distance from Naperville, IL, in miles: 1

Cost for 3 cubic yards of mulch

=====

Mulch: \$	108.00
Delivery charge: \$	35.00
Sales tax: \$	7.56
Total cost: \$	150.56

Test Case 2: Test when cubic yards required is exactly 3

Mulch Cost Calculator

=====

Enter the length of the planting bed, in feet: 20

Enter the width of the planting bed, in feet: 9

Enter the desired depth of mulch, in inches: 4

Total much required is approximately 3 cubic yards.

Enter your distance from Naperville, IL, in miles: 1

Cost for 3 cubic yards of mulch

=====

Mulch: \$	108.00
Delivery charge: \$	35.00
Sales tax: \$	7.56
Total cost: \$	150.56

Test Case 3: Test when cubic yards required is greater than 3 but less than or equal to 5

Mulch Cost Calculator

=====

Enter the length of the planting bed, in feet: 30

Enter the width of the planting bed, in feet: 10

Enter the desired depth of mulch, in inches: 5

Total much required is approximately 5 cubic yards.

Enter your distance from Naperville, IL, in miles: 1

Cost for 5 cubic yards of mulch

=====

Mulch: \$	180.00
Delivery charge: \$	35.00
Sales tax: \$	12.60
Total cost: \$	227.60

Test Case 4: Test when cubic yards required is greater than 5 but less than or equal to 10

Mulch Cost Calculator

=====

Enter the length of the planting bed, in feet: 43

Enter the width of the planting bed, in feet: 14

Enter the desired depth of mulch, in inches: 4

Total much required is approximately 8 cubic yards.

Enter your distance from Naperville, IL, in miles: 1

Cost for 8 cubic yards of mulch

=====

Mulch: \$	279.00
Delivery charge: \$	35.00
Sales tax: \$	19.53
Total cost: \$	333.53

Test Case 5: Test when cubic yards required is greater than 10

Mulch Cost Calculator

=====

Enter the length of the planting bed, in feet: 49

Enter the width of the planting bed, in feet: 18

Enter the desired depth of mulch, in inches: 4

Total much required is approximately 11 cubic yards.

Enter your distance from Naperville, IL, in miles: 1

Cost for 11 cubic yards of mulch

=====

Mulch: \$	375.00
Delivery charge: \$	35.00
Sales tax: \$	26.25
Total cost: \$	436.25

Test Case 6: Test when delivery miles is less than or equal to 8

Mulch Cost Calculator

=====

Enter the length of the planting bed, in feet: 10

Enter the width of the planting bed, in feet: 3

Enter the desired depth of mulch, in inches: 4

Total much required is approximately 1 cubic yards.

The minimum mulch order is 3 cubic yards.

Enter your distance from Naperville, IL, in miles: 8

Cost for 3 cubic yards of mulch

=====

Mulch: \$	108.00
Delivery charge: \$	35.00
Sales tax: \$	7.56
Total cost: \$	150.56

Test Case 7: Test when delivery miles is greater than 8

Mulch Cost Calculator

=====

Enter the length of the planting bed, in feet: 10

Enter the width of the planting bed, in feet: 3

Enter the desired depth of mulch, in inches: 4

Total much required is approximately 1 cubic yards.

The minimum mulch order is 3 cubic yards.

Enter your distance from Naperville, IL, in miles: 9

Cost for 3 cubic yards of mulch

=====

Mulch: \$	108.00
Delivery charge: \$	38.25
Sales tax: \$	7.56
Total cost: \$	153.81