

APM 153 Assignment Three – packageweight.m and calc_roots.m

Problem: The cost of sending a package by an express delivery service is \$10.00 for the first two pounds and \$3.75 for each pound or fraction thereof over two pounds. That means that if the package weighs 2.1 pounds, you still get charged for a 3 pound package. If the package weighs more than 70 pounds, a \$10.00 excess weight surcharge is added to the cost. No package over 100 pounds will be accepted. Write a Matlab program that asks the user for the weight of their package in pounds and then computes the cost of mailing the package. If the package weighs over 100 pounds, have the program give the user a suitably polite message saying that the package cannot be accepted for delivery.

(1) Your program should prompt the user for the weight of the package and should perform the calculations correctly. (Hint: what command in Matlab will always round a number **up**?) Output should be a complete message with cost in dollars and cents.

(2) Variable names should be meaningful and clear. (Example: what would be a good (and preferably short) variable name that means “the weight of the package”?)

(3) The m file should be well documented with appropriate headers and comments. Documentation should definitely include,...

Program Description

Your Name, Date, Assignment #, Course #

A Dictionary (alphabetized!)

Additional comments to explain each section

(4) To be sure your program works correctly, it would be useful to calculate by hand how much money some test packages would cost to ship. Fill in the blanks below with the correct cost for shipping each package. Use the examples to help you set up each calculation.

	Package Weight	Calculation	Cost
A.	2.4 lbs (rounds up to 3 lbs)	$\$10 + (\text{weigh} - 2) * \3.75	\$13.75

Package weighs more than 2 lbs so we round up to 3
\$10 for the 1st two pounds, and 3.75 for the third $\$10 + \$3.75 = \$13.75$

B. 70.1 lbs (rounds up 71 lbs) $\$10 + (\text{weight} - 2) * \$3.75 + \$10$ \$278.75

Package weighs more than 70 lbs so we round up to 71

\$10 for the 1st two pounds, and \$3.75 for the next 69 lbs. $\$10 + (69 * \$3.75)$

package weighs more than 70 lbs so we add surcharge. + additional \$10

$$\$10 + (69 * \$3.75) + \$10 = \$278.75$$

C. 13 lbs _____

D. 99.9 lbs _____

To be Handed In: A MS Word document with,...

Part One: A list of the inputs and outputs

Part Two: Your algorithm written as a flowchart and as pseudocode

Part Three: A copy of your packageweight.m program. Just paste into Word.

Part Four: A copy of the diary file *Assignment3.txt* that demonstrates that your program works correctly by calculating the cost for the following weights.

(a) 2 lbs (b) 6.5 lbs (c) 70 lbs (d) 100 lbs (e) 101 lbs

Part Five: At the end of your diary file, demonstrate that your calc_roots.m file works correctly by finding the roots to the following equations.

(a) $x^2 + 16x - 21 = 0$ (d) $3x^2 - 6x - 6 = 0$

(b) $2x^2 + 4x - 6 = 0$ (e) $x^2 + 8x - 8 = 0$

(c) $x^2 - 8x + 16 = 0$

As Usual: Your MS Word document should look professional. One thing you can add to make your document look good might be **page numbers**. At the very least, **don't forget to add Part One, Part Two**, etc and (a), (b), (c), where needed.

Due Date: Assignment Three will be due at the beginning of lab on Feb 10th.