



PROBLEM OF THE WEEK #3
 (Spring 2021)



theres gotta be a better way to convey this information

Quantity	Price
4 Chicken Wings	4.55
5 Chicken Wings	5.70
6 Chicken Wings	6.80
7 Chicken Wings	7.95
8 Chicken Wings	9.10
9 Chicken Wings	10.20
10 Chicken Wings	11.35
11 Chicken Wings	12.50
12 Chicken Wings	13.60
13 Chicken Wings	14.75
14 Chicken Wings	15.90
15 Chicken Wings	17.00
16 Chicken Wings	18.15
17 Chicken Wings	19.30
18 Chicken Wings	20.40
19 Chicken Wings	21.55
20 Chicken Wings	22.70
24 Chicken Wings	27.25
25 Chicken Wings	27.80
26 Chicken Wings	28.95
27 Chicken Wings	30.10
28 Chicken Wings	31.20
29 Chicken Wings	32.35
30 Chicken Wings	33.50
35 Chicken Wings	39.15
40 Chicken Wings	44.80
45 Chicken Wings	50.50
50 Chicken Wings	55.60
60 Chicken Wings	67.00
70 Chicken Wings	78.30
75 Chicken Wings	83.45
80 Chicken Wings	89.10
90 Chicken Wings	100.45
100 Chicken Wings	111.25

According to this menu, if you want 100 chicken wings, you can save a nickel by buying two orders of 50 instead.

What are the highest and lowest possible prices for exactly 99 chicken wings?

For your convenience, the data from the menu are available in a text file at [<https://people.uwplatt.edu/~swensonj/wings.txt>].

Solution:

The lowest possible price is \$110.60 and the highest is \$112.85.

Proof.

The prices on the menu are generated by the ones in the table at right. Every other price is a combination of prices in the table.

The lowest price per wing is for an order of 25, and for orders of fewer than 25, the lowest price per wing is for an order of 6. Thus buying three orders of 25 and four orders of 6, for a total of \$110.60, achieves the lowest possible price for 99 wings.

The highest price per wing is for an order of 5, and the second-highest is for an order of 4, so buying 19 orders of 5 and a single order of 4, for a total of \$112.85, achieves the highest possible price for 99 wings. \square

wings	price	\$/wing
25	27.80	1.1120
75	83.45	1.1127
26	28.95	1.1135
28	31.20	1.1143
27	30.10	1.1148
6	6.80	1.1333
9	10.20	1.1333
24	27.25	1.1354
7	7.95	1.1357
4	4.55	1.1375
5	5.70	1.1400

Source: Suggested by @seanposting on Twitter, e.g. <https://www.pinterest.com/pin/654781233300439453/>.