

### EXAMPLE 3

Problem: Minimalist Cables LLC sells three sizes of communication cable: Limited Capacity, Moderate Capacity, and High Capacity. Limited Capacity cable costs \$1.23 per foot. Moderate Capacity cable costs \$5.27 per foot. High Capacity cable costs \$21.23 per foot. Orders greater than \$300 get free shipping; for others, there is a \$100 shipping charge. Write a program to find the price of an order.

Analysis:

The inputs are the customer's choice of cable type and length. The output is the price. The customer is going to tell the clerk what type cable she wants, and what length, and the clerk is going to run this program to get a price. We want to keep the clerk's work as simple as possible. So we'll have the clerk type a single character, which should be L, M, or H. That is, this first input will be a data item of data type Character. The clerk must also enter the length desired.

The cable length must be multiplied by whichever per-foot cost is applicable to the ordered cable type. Then, the result obtained must be compared to the free-shipping amount. If the price is below the free-shipping amount, shipping costs of \$100 must be added.

Variables table:

Name	Data Type	Usage
TypeCode	Character	Code letter for the customer's choice
Length	Float	Cable length ordered
Price	Float	Total price (which may include shipping)

Test Cases:

Type selected (Input)	Length (Input)	Price (Output)
L	20	\$124.60
M	33	\$273.91
H	100	\$2123.00

### Pseudocode

```
Begin program
Declare Character TypeCode
Declare Float Price
// Data acquisition
Print "Type L for Low Capacity, M for Medium Capacity, or H for High Capacity"
Input TypeCode
Print "Please enter the length"
Input Length
```

```

//Computation of base price
If (TypeCode == 'L' ) Then
    Price = Length*1.23
Else if (TypeCode == 'M' )
    Price = Length*5.27
Else if (TypeCode == 'H')
    Price = Length*21.23
Endif

// Add shipping cost if price is low
If (Price <= 300) Price = Price + 100 Endif

// Now show the result
Print "The total price is " + Price
End program

```

Potential Discussion Questions (for “Comments and Questions”):

- What will happen if the clerk types X instead of L, M, or H?
- What will happen if the clerk types “Hello” instead of a numeric value for length?
- How could the program be improved to handle this sort of thing?

Here is how this example would look in C. But, remember, this is just a “show and tell”; we do NOT expect you to learn to program in C in this class, and neither any of the assignments nor your final project require you to write code in C.

```

// C language boilerplate stuff
#include <stdio.h>
int main()

{    // Begin program
    // Variable declarations
    char TypeCode;           // Data type is Character
    float Price, Length;

    // Data acquisition
    printf("Type L for Low Capacity, M for Medium Capacity,");
    printf("or H for High Capacity: ");
    scanf("%c", &TypeCode);
    printf("\nPlease enter the length: ");
    scanf("%d", &Length);

    //Computation of base price
    if      (TypeCode == 'L') Price = Length* 1.23;
    else if (TypeCode == 'M') Price = Length* 5.27;
    else if (TypeCode == 'H') Price = Length*21.23;

```

```
// Add shipping cost if price is low
if (Price <= 300) Price = Price + 100;

// Now show the result
printf("\nThe total price is $%8.2f \n", Price);

} // End Program
```