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You should include the output from your test runs in your submissions. You can either write a short script file to test your functions or you can run them from the command line.

- 1) (3 pts) Write Problem 2 from HW 9 as a function. It should take in a weight and output the cost to ship the package.
- 2) (5 pts) Write Problem 3 from HW 12 as a function. You should generate  $\mathbf{x}$  in a test script or from the command line, then send this as input to the function. It should output the harmonic mean of the values in  $\mathbf{x}$ .
- 3) (4 pts) Write Problem 3 of HW 11 as a function. Generate the vector  $\mathbf{x}$  either in a test script or from the command line. The function should take the vector  $\mathbf{x}$  as input and output the number of values  $\geq 0.5$  and the number of values  $< 0.5$ .
- 4) (8 pts) Recall that the binomial coefficient  $C(n, k)$  for the number of combinations of  $n$  items taken  $k$  at a time is defined by:

$$C(n, k) = \binom{n}{k} = \frac{n!}{k!(n-k)!}, \quad n \geq k.$$

Write a function that will take  $n$  and  $k$  as inputs and output the value of the binomial coefficient. Use your function to compute the values of  $C(3, 1)$ ,  $C(5, 3)$ ,  $C(14, 5)$ , and  $C(10, 0)$ .

You should use the factorial function we wrote in class to compute the needed factorials in this function.