



All questions are mapped to CLO-4

- Q1. Write a function called **cumsum** that takes a list of numbers and returns the cumulative sum; that is, a new list where the  $i$ th element is the sum of the first  $i + 1$  elements from the original list. For example:

```
>>> t = [1, 2, 3]
>>> cumsum(t)
[1, 3, 6]
```

- Q2. Write a function that draws a grid like the following:  
Hint: to print more than one value on a line, you can print a comma-separated sequence of values: `print('+', '-')`  
By default, print advances to the next line, but you can override that behavior and put a space at the end, like this:  
`print('+', end=' ')`  
`print('-')`



- Q3. A Caesar cypher is a weak form of encryption that involves “rotating” each letter by a fixed number of places. To rotate a letter means to shift it through the alphabet, wrapping around to the beginning if necessary, so ‘A’ rotated by 3 is ‘D’ and ‘Z’ rotated by 1 is ‘A’. To rotate a word, rotate each letter by the same amount. For example, “cheer” rotated by 7 is “jolly” and “melon” rotated by -10 is “cubed”. In the movie 2001: A Space Odyssey, the ship computer is called HAL, which is IBM rotated by -1.

Write a function called **rotate\_word** that takes a string and an integer as parameters, and returns a new string that contains the letters from the original string rotated by the given amount. You might want to use the built-in function *ord*, which converts a character to a numeric code, and *chr*, which converts numeric codes to characters.

- Q4. Write the following function that merges two sorted lists into a new sorted list:

**def merge(list1, list2):**

*Note: Don't use default functions*

Write a test program that prompts the user to enter two sorted lists and displays the merged list. Here is a sample run:

```
Enter List1: 1 5 16 61 111
Enter List2: 2 4 5 6
The merged list is: 1 2 4 5 5 6 16 61 111
```

- Q5. A perfect number is a number for which the sum of its proper divisors is exactly equal to the number. For example, the sum of the proper divisors of 28 would be  $1 + 2 + 4 + 7 + 14 = 28$ , which means that 28 is a perfect number. There are four perfect numbers less than 10,000. Write a program to find these four numbers.