

Sheet 1

1. Write a short Python function, `is even(k)`, that takes an integer value and returns True if `k` is even, and False otherwise.
2. Write a short Python function, `minmax(data)`, that takes a sequence of one or more numbers, and returns the smallest and largest numbers, in the form of a tuple of length two. Do not use the built-in functions `min` or `max` in implementing your solution.
3. Write a short Python function that takes a positive integer `n` and returns the sum of the squares of all the positive integers smaller than `n`.
4. Python allows negative integers to be used as indices into a sequence, such as a string. If string `s` has length `n`, and expression `s[k]` is used for index $-n \leq k < 0$, what is the equivalent index $j \geq 0$ such that `s[j]` references the same element?
5. What parameters should be sent to the range constructor, to produce a range with values 50, 60, 70, 80?
6. Demonstrate how to use Python's list comprehension syntax to produce the list [1, 2, 4, 8, 16, 32, 64, 128, 256].
7. Write a Python function that takes a sequence of numbers and determines if all the numbers are different from each other (that is, they are distinct).
8. Write a short Python function that counts the number of vowels in a given character string.