

MAT 116E Advanced Scientific and Engineering Computing

Lab-8

Q-1. Suppose we want to calculate the amount of soda in a can and the price of that soda in dollars/litre. We may want to do this for lots of different soda cans and soda can prices.

Since we're going to have to do the same calculation several times over we choose to write a function. This will help keep the calculation tidy. To calculate the amount of soda we need to calculate the volume of a can. Let h be the height of the can in cm, r its Radius in cm, and vol its volume in litres. The formula for the volume in litres is

$$vol = \pi hr^2 / 1000$$

Since there are 1000 cubic centimetres in a litre.

Input:

- Height of can
- Radius of can
- Price of can

Output:

- Volume of can/soda
- Price per litre of soda

Q-2. A k-bonacci sequence starts with K-1 zeros and then a one. Each subsequent element is the sum of the previous K elements. The 2-bonacci sequence is the standard Fibonacci sequence. The 3-bonacci and 4-bonacci sequences each start with the following ten elements:

n :	1,	2,	3,	4,	5,	6,	7,	8,	9,	...
$kbonacci(n, 2):$	0,	1,	1,	2,	3,	5,	8,	13,	21,	...
$kbonacci(n, 3):$	0,	0,	1,	1,	2,	4,	7,	13,	24,	...
$kbonacci(n, 4):$	0,	0,	0,	1,	1,	2,	4,	8,	15,	...

Write a function name **kbonacci** that takes non-negative integer n and positive integer k and returns element n of a k-bonacci sequence.