

CSI 31: Preparation for Midterm. Spring 2022. Prof. Pineiro

- (1) The Fibonacci sequence is a sequence of numbers where each successive number is the sum of the previous two. The Fibonacci sequence begins with 1,1,2,3,5,8,13,21, ... Write a program that first invites the user to input a natural number n . Then compute the n -th Fibonacci number and display it appropriately to the user.
- (2) You will need to use the module `graphics.py` for this program. Write a program that constructs a window, invites the user to input a number $n > 2$ and allow the user to enter n clicks in the window to create a list of points to build a polygon. Draw the polygon, fill it with your favorite color. Finally, prompt the user to click to close the window.
- (3) Given a natural number n , write a function `sumNSquares(n)` which returns the sum of the squares of the first n natural numbers. Using this function write a program that prompts a user for an n and prints out the sum of the squares of the first n natural numbers.
- (4) Write a function `clean(L)` that takes a list L and return the list L in order and without repeated values. For example for $L = ['c', 'a', 'a', 'b', 'b', 'c', 'b', 'a']$, the function should return `['a', 'b', 'c']`.
- (5) Perfect squares are numbers like: 1, 4, 9, 16, 25, ... with an exact square root. They are product of some integers with itself. Write a function `isPerfectSquare(n)` that returns `True` if the number n is a perfect square and `False` otherwise. Use your function to create a list of perfect squares in the range 1000 to 2000.
- (6) Write a function `isPrime(n)` that returns `True` if the number n is prime and `False` otherwise. Use your result to create a list of prime numbers in the range 1000 to 2000.
- (7) Write a program that opens a file named 'customer.txt' having the format 'name lastname age gender' in each line, and then create a new file 'adultCustomer.txt' to write to it the first and last name of all persons which age is at least 21.
- (8) Write a program that receives a number from the user and determines if the number is divisible by two, by three, by both or by none of them.
- (9) Write a program to compute an approximation of the number π using the the first n terms of the formula:

$$\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} \dots$$