

Simple Exercises

Functions

1. Write a function of two arguments m and n that prints out m asterisks followed by n spaces followed by m asterisks. (Hint: You need to form such a string and then just print out the string.) This is an example of a fruitless function that does not return a value and that does not have to, but can have a return statement.

2. Implement the mathematical function given by $f(x) = \frac{10 + x^2}{1 + x^3}$.

Conditional Expressions:

1. Write a function that takes in the age of a geological event in millions of years, and returns the geological era of the event according to the following table as a string. There are no events for negative number of years or with more than 4570 years, since the earth started to form at that time (according to current best geological knowledge). If such a number is passed to the function, the function should return “no such era”.

Time in Million of Years	Name of Era
0 - 70	Cenozoic
70 - 252	Mesozoic
252 - 541	Paleozoic
541 - 2800	Proterozoic
2800 - 4000	Archaic
4000 - 4570	Hadean

2. Write a function that implements the following mathematical function f for a floating point

number x : $f(x) = \begin{cases} \sqrt{x} & \text{if } x > 0 \\ x^2 & \text{if } x \leq 0 \end{cases}$. Remember that you need to return a value.

Lists

1. Write a function that takes two lists as parameters. The function returns a new list with all the elements of the first list that are not in the second list.
2. Write a function that takes a list of integers as its sole parameter. The function returns another list that consists of the integers squared in the first list. For example, if the user gives the list $[2,3,4,5]$ as input, then the function returns a new list $[4,9,16,25]$

Strings

1. Write a function that takes as input a single string. The function returns the number of occurrences of the letter 'z' in the string.
2. Write a function that takes as input a single string. The function returns a new string where every letter 'a' is replaced by the letter 'e', every letter 'e' is replaced by the letter 'i', and every letter 'i' is replaced by the letter 'a'.