# Functions and Lambda Expressions

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## 1. Short Answer Questions

**Q1. Explain the difference between `def` statements and `lambda` expressions. Give an example of each.**

**Q2. List and explain three benefits of using lambda expressions.**

**Q3. Compare `map()`, `filter()`, and `reduce()` with one-line examples using a lambda function and a list.**

**Q4. What are function annotations in Python? Write a function that uses them.**

**Q5. What is a recursive function? Write a simple recursive function to calculate the factorial of a number.**

**Q6. State five design guidelines you should follow while writing functions in Python.**

**Q7. Name at least three ways a function can communicate results to a caller and briefly explain each.**

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## 2. Coding Tasks

**Task 1:**

Write a lambda function that takes two numbers and returns their product. Assign it to a variable and call it with `5` and `7`.

**Task 2:**

Use `map()` to square every number in a list `[1, 2, 3, 4, 5]`.

**Task 3:**

Use `filter()` to extract only the even numbers from the list `[10, 15, 20, 25, 30]`.

**Task 4:**

Use `reduce()` from `functools` to calculate the product of numbers in `[1, 2, 3, 4, 5]`.

**Task 5:**

Create a function with annotations that:

- takes an integer as input,

- returns a string saying whether it is "Even" or "Odd".

**Task 6:**

Write a recursive function to compute the sum of all numbers from `1` to `n`.

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## Bonus Question

Write a function that returns different results using `print`, `return`, and `yield`. Call the function and show how each type of output works.

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