**Basic Level**

1. **Square Each Element**
   * Write a function squareElements(vec) that takes a vector as input and returns a new vector where each element is squared.
   * **Example:**

matlab

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squareElements([1, 2, 3, 4]) → [1, 4, 9, 16]

1. **Convert Fahrenheit to Celsius**
   * Write a function fahrenheitToCelsius(F) that converts a given temperature in Fahrenheit to Celsius.
   * Formula: C=F−321.8C = \frac{F - 32}{1.8}C=1.8F−32​
   * **Example:**

matlab

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fahrenheitToCelsius(98.6) → 37

1. **Count Even Numbers**
   * Write a function countEvens(vec) that counts the number of even numbers in a vector.
   * **Example:**

matlab

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countEvens([1, 2, 3, 4, 5, 6]) → 3

1. **Reverse a Vector**
   * Write a function reverseVector(vec) that reverses the order of elements in a given vector.
   * **Example:**

matlab

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reverseVector([1, 2, 3, 4]) → [4, 3, 2, 1]

**Intermediate Level**

1. **Sum of Factorials**
   * Write a function sumFactorials(n) that calculates the sum of factorials from 1 to n.
   * **Example:**

matlab

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sumFactorials(4) → 1! + 2! + 3! + 4! = 33

* + **Hint:** Use a loop or MATLAB’s built-in factorial() function.

1. **Check if a Number is Prime**
   * Write a function isPrimeNumber(n) that returns true if n is prime and false otherwise.
   * **Example:**

matlab

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isPrimeNumber(7) → true

isPrimeNumber(10) → false

1. **Find the Maximum Value Without max()**
   * Write a function findMax(vec) that returns the maximum value in a vector **without using max()**.
   * **Example:**

matlab

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findMax([3, 1, 7, 2]) → 7

1. **Generate a Fibonacci Sequence**
   * Write a function fibonacci(n) that returns the first n Fibonacci numbers as a vector.
   * **Example:**

matlab

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fibonacci(6) → [0, 1, 1, 2, 3, 5]

**Advanced Level**

1. **Matrix Multiplication Without \* Operator**
   * Write a function matrixMultiply(A, B) that multiplies two matrices **without using \***.
   * **Hint:** Use nested loops.
2. **Find the Mode of a Vector**

* Write a function findMode(vec) that returns the most frequently occurring number in a vector.
* **Example:**

matlab

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findMode([4, 1, 2, 4, 3, 4, 2, 1]) → 4

* **Hint:** Use a loop to count occurrences.

1. **Simulate a Dice Roll**

* Write a function rollDice(n) that simulates rolling an n-sided die and returns a random number between 1 and n.
* **Example:**

matlab

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rollDice(6) → 3 (random output)

1. **Palindrome Checker**

* Write a function isPalindrome(str) that checks if a given string is a palindrome (reads the same forward and backward).
* **Example:**

matlab

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isPalindrome('racecar') → true

isPalindrome('hello') → false