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CEN524 ASSIGNMENT

Task 1

Write an algorithm for summing of the Taylor series.

Title: Taylor Series

Input: F[ ], a, x, n

Initialize: sum = 0, term = 0, factorial = 1

For i = 0 to n – 1 then

Term = F[i] \* ((x – a) ^i ) / i!

Sum = sum + term

End For

Return Sum

Task 2

With an algorithm, write out the procedure for calculating the factorial of a given integer n; (i.e. n!).

Title: Factorial

Input: n;

Initialize: factorial = 1;

For i = 1 to (n + 1) then

Factorial = factorial \* i

End For

Return factorial

Task 3

With the aid of an algorithm, write out the procedure for calculating the Pearson’s Correlation Coefficient of two variables (x and y)

Title: Pearson’s Correlation Coefficient

Input: Two lists x and y

Initialize: Mean of x (x̄) and y (ȳ), numerator = 1, denominator = 1, result = 1

numerator = sum((x[i] - x̄) \* (y[i] - ȳ))

denominator = square root of (sum((x[i] - x̄)^2) \* sum(([y] - ȳ)^2))

result = numerator / denominator

Return result

Task 4

Write an algorithm for Newton’s Iterative Formula to find the Reciprocal of a Number N and state the timing Notation

Title: Newton’s Iterative Formula

Input: N = 5, x0 = 0.1 , iterations = 10

Initialize: xi = x0

For i = 0 to iterations – 1

Xi + 1 = xi \* (2 – xi \* N)

End For

Return xi