



SCM513: INTRODUCTION TO SCIENTIFIC COMPUTING PART 2: C PROGRAMMING PROJECT

Elliot Menkah

elliotsmenkah@gmail.com

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1 PROJECT

- 1 Generate the Pascal Triangle for a given depth as a 2D Array. Provide a function for printing out the generated triangle
- 2 Write a function to determine if a given point is on a given curve. The curve will be provided in the string format " $Ax^2 + Bx + C$ " and the point will be provided in the string format (x,y)
- 3 Write a program to find local minimas and maximas given a curve, a range and a step. The function must return an array of points with each point marked as min or max.
- 4 Write a function that given a dimension, generates the multiplication table up to that dimension as a 2D array. Write another function that can print the generated table

- 5 Write a function that returns the HCF of a group of integers. It should take as input an array of integers and return an integer
- 6 Write a function that returns the LCM of a group of integers. It should take as input an array of integers and return an integer
- 7 Write a function that generates all prime numbers in a given interval.
- 8 Write a function that generates the inverse of a matrix
- 9 Write a function that generates the dot multiplication of 2 vectors
- 10 Write a function that uses the jacobi method to resolve a system of equations
- 11 Write a function that uses the Newton-Raphson method to find the roots of a function

- 12 Write a function that uses the Secant method to find the roots of a function
- 13 Write a function that uses the Bisection method to find the roots of a function
- 14 Write a function that uses the Golden Falsi method to find the roots of a function
- 15 Write a function that uses the fixed-point method to find the roots of a function
- 16 Write a function that uses Taylor series to resolve $\sin(x)$
- 17 Write a function that uses Taylor series to resolve $\cos(x)$