

# Birla Institute of Technology and Science, Pilani

Department of Computer Science and Information Systems

Semester I (2020-21)

Principles of Programming Languages (CS F301)

Tutorial sheet (#4)

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1. An array is declared as `float A[10][20][30][12]`; Discuss the compile time layout of the array. If R1, R2, R3, R4 represent the first, second, third and fourth dimensions, then if the layout follows R1, R3, R4, R2, then compute the address of the element `A[m][n][p][k]`.
2. Design a two dimensional array which can represent flexible sizes of columns and discuss the design issues.
3. Construct the grammar to define Jagged arrays. Work out the compile time layout of the Jagged array variable and define an expression to compute the address of `A[m][n]`. What is the bound checking mechanism that can be used in this context?
4. An array uses enumeration type as subscript range to represent the students in a university. The type is defined as follows

`ENUM year = { Fresh, Soph, Junior, Senior, Graduate }`

Declare A: array [year] of real;

Show the type expression for the defined array A and give an expression for computing the location of the element `A[k]`.

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