

Indian Institute of Technology Roorkee
MAN106 Data structures

Tutorial 2: Arrays

1. Consider $\text{var } A\{lb..ub\}, B\{lb_1..ub_1\}\{lb_2..ub_2\}$ real;
Write storage allocation for arrays A and B. If $lb = -10, ub = 5$, what is the address of $A[4]$ when $l_0 = 524$.
What is the address of $B[-2] \dots [-1]$ when $lb_1 = lb_2 = -10, ub_1 = ub_2 = 10; l_0 = 1024$.

2. Given the declaration

```
Struct node { char id[8];  
              char* studentName;  
              double CGPA; } node A[10];
```

Find the address of $A[1]$, $A[3].studentName$, when $\&A = 512$. Find the size of A also

3. Assume that an integer needs four bytes, a real number needs eight bytes and character needs one byte. Assume the following definitions and declarations:

```
struct date { int day[2];  
              char month[10];  
              int year[4]; };  
struct person_details { Char name[20];  
                        Struct date date_detail[2];  
                        // for date of joining and for Date of birth  
                        int salary;  
                        char address[20];  
                        char emailAddress[20]; };
```

Struct person_details p [200];

If the starting address of p is 100, what are the starting addresses (in bytes) of each of the following?

$p[10]$, $p[20].date_detail[1].month[3]$, $p[20].salary$,
 $p[20].address[5]$, $p[5].date_detail[2].day[2]$,
 $p[10].emailAddress[10]$.

4. Write algorithm for inserting three items consecutively in an array of size $N=10$ at the i th index. Assume that currently there are M items in the array. Give the restrictions on i and M .

Write algorithm for deleting i th item from an array of size $N=10$ when there are k elements in the array such that $i \leq k \leq N$.

6. Write a C++ program to check whether the elements in a two dimensional array are stored in row major or column major.