CSE/IT   Batch-Hinglish

Data Structure
Arrays-I   DPP-01

[NAT]
1. Consider a 1D array a with 9 elements. If the base address of the array is 108 and the size of each array element is 4 bytes, the address of a[7] is- _____ (Assume array index starts from 0)

[NAT]
2.
Consider a 1D array a[-127…………..,+255] where -127 and +255 are the starting index and ending index of the array respectively. The number of elements in the array is _____.

[NAT]
3. Consider a 1D array a with 19 elements. If the base address of the array is 108 and the size of each array element is 4 bytes, the address of a[7] is- (Assume array index starts from -11)_____

[NAT]
4. Consider a 2D array a[-127 to +255][-13 to +14]. The number of elements in the array is _____.

[NAT]
5. Consider the natural numbers from 1 to 256 are stored in a 2D array arr[-28 to 3][-3 to 3]. Find the element present at location arr[-16][1]. (Suppose, the elements are stored in row-major order)_____

[NAT]
6. Consider the natural numbers from 1 to 256 are stored in a 2D array arr[-28 to 3][-3 to 3]. Find the address of the location arr[-16][1] if the starting address of the array is 625 and size of each element is 4 bytes. (Suppose, the elements are stored in row-major order) _____.

[NAT]
7. Consider the whole numbers from 0 to 127 are stored in a 2D array arr[0 to 15][0 to 7]. Find the element present at location arr[6][4]. (Suppose, the elements are stored in column-major order)_____

[NAT]
8. Consider a 2D array arr[-15 to 15][-7 to 7]. Find the address of the location arr[-1][5] if the starting address of the array is 500 and size of each element is 4 bytes. (Suppose, the elements are stored in column-major order) _____

Answer Key

1. (136)
2. (383)
3. (180)
4. (10724)

5. (89)
6. (977)
7. (70)
8. (2044)

Hints and Solutions

1. (136)
Address of a[7] = 108+(7-0)*4 = 136.

2. (383)
Number of elements in the array=255-(-127)+1=383

3. (180)
Address of a[7] = 108+(7-(-11))*4 = 180.

4. (10724)
Number of elements in each row= 255-(-127)+1=383
Number of elements in each column = +14-(-13)+1=28
Number of elements in the 2D array = 383*28 = 10724

5. (89)
Number of elements in each column=3-(-3)+1=7
The element present at arr[-16][1]
=(-16-(-28))*7+(1-(-3)+1)
=89.

6. (977)
Number of elements in each column= 3-(-3)+1=7
Address of location arr[-16][1]
= 625 + [(-16-(-28))*7+(1-(-3))]*4
= 977

7. (70)
Number of elements in each row= 16
The element present at arr[6][4]=(4-0)*16+(6-0)=70

8. (2044)
Number of elements in each row= 15-(-15)+1=31
Address of location arr[-1][5]
= 500 + [(5-(-7))*31+(-1-(-15))]*4
= 2044