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DUBAI INTERNATIONAL ACADEMIC CITY, DUBAI

FIRST SEMESTER 2023 – 2024

COURSE: CSF301 (Principles of Programming Languages)

COMPONENT: Tutorial Sheet 4a

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Q1. In C language representation, Calculate the address of each of the following two elements in a 2D Array of size A[10][25] when it follows Row-major ordering:

a) A [7][20] b) A[4][6]

Consider the following assumptions: Width (W) for each element is 4 Bytes; Base Address (B) is 2000 (assume decimal system for memory address in this problem). The first element of the array is A[0][0].

Answer:

$A[7][20] = 2000 + 4 * [25 (7-0) + (20-0)] = 2000 + 4 * (175+20)=4*195=2780$

$A[4][6] = 2000 + 4 * [25 (4-0) + (6-0)] = 2000 + 4 * (100+6)=4*106=2424$

Q2. What is the output or errors in following C codes. In case of errors provide justification of errors.

Program 1:

```
#include <stdio.h>
struct test {
    int x = 0;
    char y = 'A';
};
int main()
{
    struct test t;
    printf("%d, %c", s.x, s.y);
    return 0;
}
```

Answer:

Error: We cannot initialize the members of structure inside the structure declaration.

Program 2:

```
#include <stdio.h>
struct result{
    char sub[20];
    int marks;
};
void main()
{
    struct result res[] = { {"Maths",100},
    {"Science",90},
    {"English",85}
    };
    printf("%s ", res[1].sub);
}
```

```
    printf("%d", (*(res+2)).marks);  
}
```

Answer:

Science 85

Program 3:

```
#include <stdio.h>  
int main()  
{  
    union demo {  
        int x;  
        int y;  
    };  
  
    union demo a = 100;  
    printf("%d %d",a.x,a.y);  
}
```

Answer:

Error: You cannot initialize a union variable like “union demo a = 100”

Program 4:

```
#include <stdio.h>  
int main()  
{  
    enum days {MON=-1, TUE, WED=4, THU, FRI, SAT};  
    printf("%d, %d, %d, %d, %d, %d", MON, TUE, WED, THU, FRI, SAT);  
    return 0;  
}
```

Answer:

-1 0 4 5 6 7