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الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي
المدرسة العليا للإعلام الآلي
8 ماي 1945 - سيدي بلعباس

TP/TD 03 Introduction to Java programming language 2

Part One (String and Arrays):★★★☆☆ **(**Estimated time 45 min**)**

Task 1- Write java method that perform the following calculations:

1. The power of 5 of an integer given as a parameter.
2. The product of two integers given as a parameter minus their sum.
3. The product of three integers given as an integer **Array** parameter.

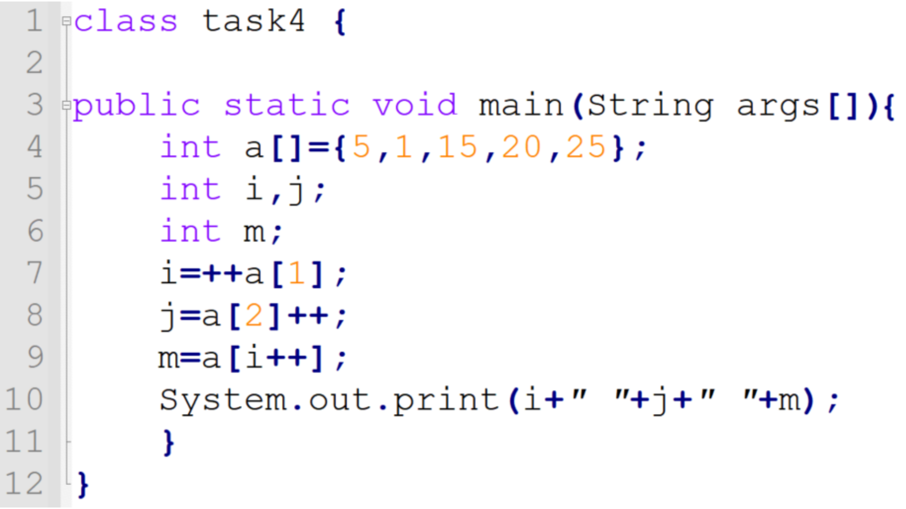
Task 2- In following a table of some Real Madrid team players.

Write a Method that takes a T-shirt number and returns a player's name.

Player	Courtois	Dani	Alaba	Nacho	Hazard	Kroos	Benzema	Asensio	Luka
Tshirt N°	1	2	4	6	7	8	9	11	10

Task 3- Write a java method that checks if an email ends with “**@esi-sba.dz”.**

Task 4- What will be the output of the following program:



```
class task4 {

public static void main(String args[]){
       int a[]={5,1,15,20,25};
       int i,j;
       int m;
       i=++a[1];
       j=a[2]++;
       m=a[i++];
       System.out.print(i+" "+j+" "+m);
       }
}
```

Task 5- Write a java method that takes a String as parameter and return the reverse of that String.

Task 6- Write a java method to reverse String using recursion.

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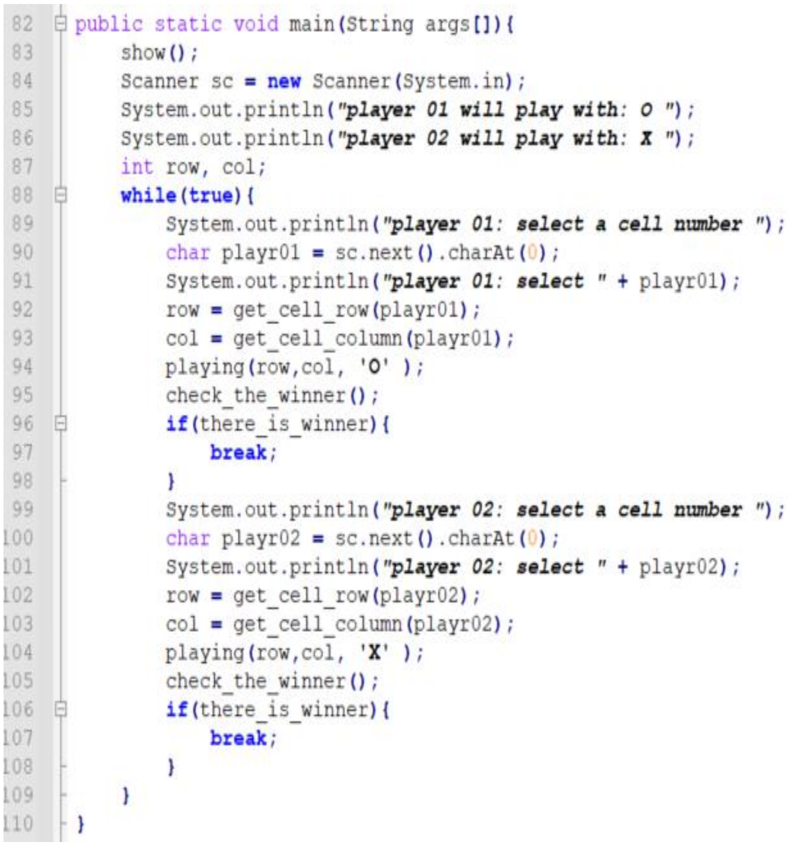
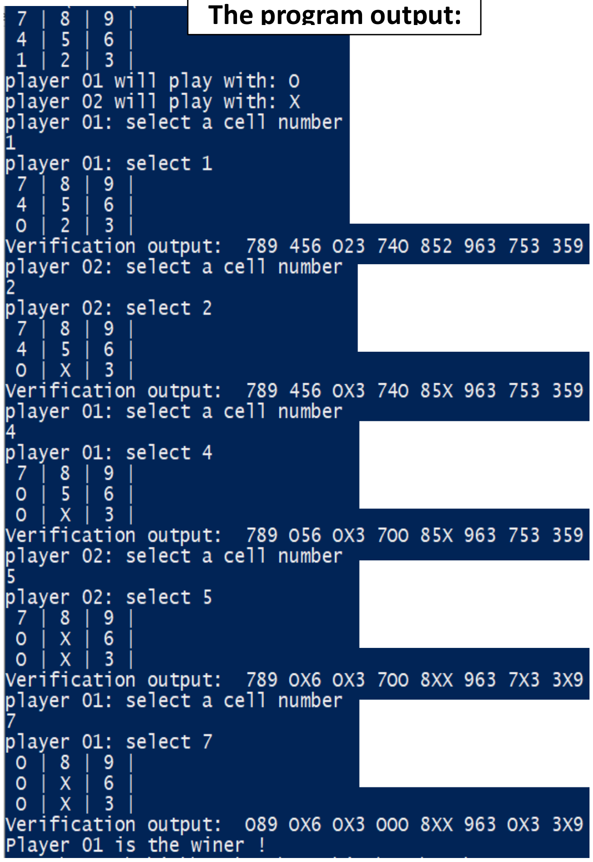
Part Two (Coding a Game): ★★★★☆ (estimated time 1:15 min)

We are interested to implement a **tic tac toe** game between two players using java programming language. The main method will contain the following code:



```
public static void main(String args[]){
    show();
    Scanner sc = new Scanner(System.in);
    System.out.println("player 01 will play with: O ");
    System.out.println("player 02 will play with: X ");
    int row, col;
    while(true){
        System.out.println("player 01: select a cell number ");
        char playr01 = sc.next().charAt(0);
        System.out.println("player 01: select " + playr01);
        row = get_cell_row(playr01);
        col = get_cell_column(playr01);
        playing(row,col, 'O' );
        check_the_winner();
        if(there_is_winner){
            break;
        }
        System.out.println("player 02: select a cell number ");
        char playr02 = sc.next().charAt(0);
        System.out.println("player 02: select " + playr02);
        row = get_cell_row(playr02);
        col = get_cell_column(playr02);
        playing(row,col, 'X' );
        check_the_winner();
        if(there_is_winner){
            break;
        }
    }
}
```

The program output:



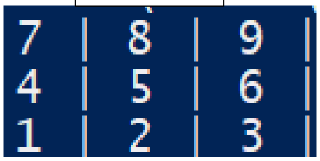
```
 7 | 8 | 9 |
 4 | 5 | 6 |
 1 | 2 | 3 |
player 01 will play with: O
player 02 will play with: X
player 01: select a cell number
1
player 01: select 1
 7 | 8 | 9 |
 4 | 5 | 6 |
 O | 2 | 3 |
Verification output:  789 456 O23 74O 852 963 753 359
player 02: select a cell number
2
player 02: select 2
 7 | 8 | 9 |
 4 | 5 | 6 |
 O | X | 3 |
Verification output:  789 456 OX3 74O 85X 963 753 359
player 01: select a cell number
4
player 01: select 4
 7 | 8 | 9 |
 O | 5 | 6 |
 O | X | 3 |
Verification output:  789 O56 OX3 7OO 85X 963 753 359
player 02: select a cell number
5
player 02: select 5
 7 | 8 | 9 |
 O | X | 6 |
 O | X | 3 |
Verification output:  789 OX6 OX3 7OO 8XX 963 7X3 3X9
player 01: select a cell number
7
player 01: select 7
 O | 8 | 9 |
 O | X | 6 |
 O | X | 3 |
Verification output:  O89 OX6 OX3 OOO 8XX 963 OX3 3X9
Player 01 is the winer !
```

Todo: In the first tasks, we will start implement the display of the game, then we will move to the game functionalities.

Task 01: Define a character 2D array that contains values from 1 to 9 (as shown in table 1) of type java **char [][].**

Task 02: Create a java method named ***show()*** that iterate for each value of the array and print it. The output should be as show in table 02:

Table 02



```
7 | 8 | 9 |
4 | 5 | 6 |
1 | 2 | 3 |
```

Table 01

7	8	9
4	5	6
1	2	3

Task 03: When a use choose a cell number, we should know which row and which column of his choice. For example if player 1 choose cellule 5 we need to implement two method that return column and row number from array

public static int get_cell_row(char input)

public static int get_cell_column(char input)

Task 04: Implement a method called ***playing(row, col, 'user character: O or X')*** that takes as parameters row, col, and player character to update the 2D array**.**

Copper Task 05 << Optional >>**:**

Implement a method that check the winner called ***check_the_winner()***. That check how is the winner.

Silver Task 06 << Optional >>**:**

Implement a method that makes one of the players play randomly (human vs Random player)

Golden Task 07 << Optional >>**:**

Implement a function that treats all possible cases and makes it hard from a player to beat a computer.