

TUESDAY

Do you know the Rock Paper Scissor game?

The Rock beats the scissor, the scissor beats the paper, and the paper beats the rock....



WHAT YOUR PROGRAMM SHALL DO

- Enter 2 string (player1Sign and player2Sign) in the console
 - The string can be only "S" (for scissor) – "P" (for paper) - "R" (for rock)
- If the player 1 won, print **Player 1 won**
- If the player 2 won, print **Player 2 won**
- If both players entered same sign prints **EQUALITY**
- If a sign is not correct, print **A SIGN IS NOT CORRECT**

EXAMPLES

INPUT	EXPLANATION
>Player 1 sign: R >Player 2 sign: P > Player 2 won	The paper (player 2) beats the rock (player 1) So the player 2 won
>Player 1 sign: R >Player 2 sign: R >EQUALITY	The 2 players entered the same sign
>Player 1 sign: A >Player 2 sign: R > A SIGN IS NOT CORRECT	Player 1 sign is not correct

Q1 – What will be the result of this input?

>Player 1 sign: S
>Player 2 sign: P

Q2 – Can you write the steps of your algorithm (complete this list of steps)

1. Enter player 1 sign
2. Enter player 2 sign
3. If the 2 sign are equal print EQUALITY
4. Else...
5. Etc.

Q3 – Now you know your steps, so write your code!

CORRECTION

Q2

- 1- Enter the player signs
- 2- Check if signs are equal
- 3- Check if player 2 win
- 4- Check if player 1 win
- 5- Display error if the sign is not correct

Q3

```
# 1- Enter the player signs
player1 = str(input("Player 1 sign= "))
player2 = str(input("Player 2 sign= "))

# 2- Check if signs are equal
if player1 == player2 and (player1 == "R" or player1 == "P" or player1 == "S"
):
    print("EQUALITY")

# 3- Check if player 2 win
elif (player1 == "S" and player2 == "R") or (player1 == "R" and player2 == "P"
) or (player1 == "P" and player2 == "S"):
    print("PLAYER 2 WON")

# 4- Check if player 1 win
elif (player2 == "S" and player1 == "R") or (player2 == "R" and player1 == "P"
) or (player2 == "P" and player1 == "S"):
    print("PLAYER 1 WON")

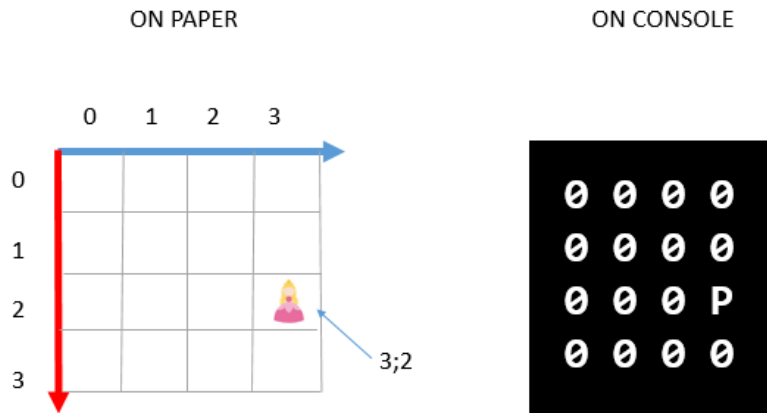
# 5- Display error if the sign is not correct
else:
    print("SIGN IS NOT CORRECT")
```

WEDNESDAY

WEDNESDAY EXERCICE 1

Let's print the princess on the console!!

The player enter the position of the princess (example : 3;2), the program shall display a grid of 4 columns and 4 rows of "0" and display the princess using the "P" character at the specified position.



WHAT YOUR PROGRAMM SHALL DO

- Enter the princess position : "X;Y"

- **CONSOLE** : console shall display : "Princess position :
 - The princess position is entered using the string of 3 characters
 - The first character must be a number between 0 to 3
 - The second character must be " ; "
 - The third character must be a number between 0 to 3

If any error you shall print **Wrong position format**

Print the grid of "0", and display the princess position in this grid, using the "P" character

EXAMPLES

INPUT	EXPLANATION
>Princess position: 2;2 >0 0 0 0 >0 0 0 0 >0 0 P 0 >0 0 0 0	Princess position is at X=2 and Y=2
>Princess position: 2;4 >Wrong position format	4 is not in the range [0,3]
>Princess position: 2/4 >Wrong position format	The string is not composed of a number + " ; " + a number

CORRECTION

Note:

- They should at least check 3 characters are entered and the range of X and Y
 - o `int()` is a new function they might not know, so maybe they could not find by themselves

```
# 1- Enter position as string
position = str(input("Enter position: "))

# 2- Check the string is composed of 3 characters
has3Character = len(position) == 3

if not has3Character:
    print("Wrong position format")
else:
    # 3- Check we have a number then ; then number
    char0IsNumber = position[0].isnumeric()
    char1IsSemiColumn = position[1] == ";"
    char2IsNumber = position[2].isnumeric()

    if not (char0IsNumber and char1IsSemiColumn and char2IsNumber):
        print("Wrong position format")
    else:

        # 4 Convert position into integer and check the range is [0,3]
        posX = int(position[0])
        posY = int(position[2])

        if posX > 3 or posY > 3 or posX < 0 or posY < 0:
            print("Wrong position format")
        else:

            # 5 Display the grid
            result = ""
            for line in range(4):
                for column in range(4):
                    if column == posX and line == posY:
                        result = result + "P "
                    else:
                        result = result + "0 "
                result = result + "\n"
            print(result)
```

WEDNESDAY EXERCICE 2

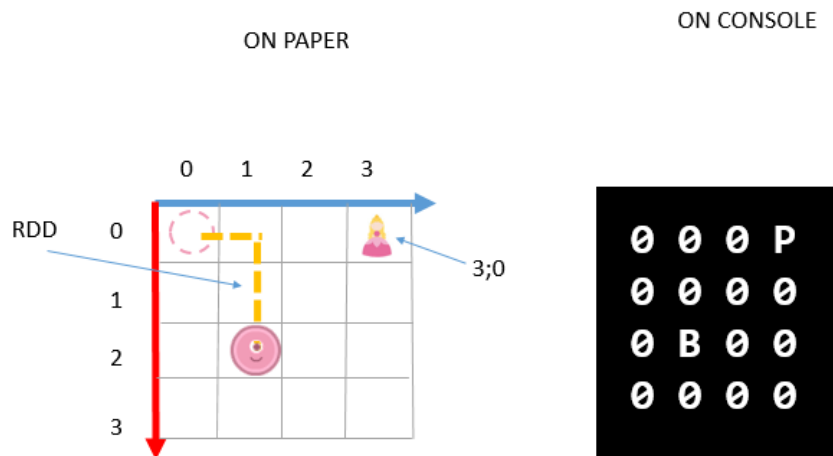
Let's continue, and now, we print the **princess** position and **Balook** position after some moves.

The player enter:

- the position of the princess (example : 3;2)
- Balook moves (example : RRDD for RIGHT + RIGHT + DOWN + DOWN)

The program shall display a grid of 4 columns and 4 rows of "O" and display:

- The princess using the "P" character at the specified position.
- The Balook position after he moves on the grid (Balook always starts from 0;0), using the "B"



WHAT YOUR PROGRAMM SHALL DO

- Enter the princess position : "X;Y"
(same as previous exercise)

- Enter Balook list of moves

- **CONSOLE** : console shall display : "Balook moves:
- Enter one string (the actions): which shall contain only: L, R, U, D

Print the grid of "O", and display :

- Princess position in this grid, using the "P" character
- Balook position in this grid, using the "B" character

If Balook is out of the grid, print : "Balook is out of the grid":

If Balook and the princess finish in the same position, replace them by "*"

EXAMPLES

INPUT	EXPLANATION
>Princess position: 2;2 >Balook moves: RDD >O O O O >O O O O >O B P O >O O O O	Princess position is at X=2 and Y=2 After moving RIGHT+DOWN+DOWN, Balook is at X= 1, Y=2
>Princess position: 2;2 >Balook moves: L >Balook is out of the grid	After moving LEFT, Balook is at X= -1, Y=0 Balook is out of the grid, since the grid can only display X between 0 and 3

<p>>Princess position: 1;3 >Balook moves: RDDD >0 0 0 0 >0 0 0 0 >0 0 0 0 >0 * 0 0</p>	<p>Princess position is at X=1 and Y=3</p> <p>After moving RIGHT+DOWN+DOWN+DOWN, Balook is at X= 1, Y=3</p> <p>The princess position and the Balook position is same, so we put “*”</p>
--	---

```

# 1- Enter princess position and balook moves
position = str(input("Enter princess position: "))
balook = str(input("Enter Balook moves:"))

# 2- Check the string is composed of 3 characters
has3Character = len(position) == 3

if not has3Character:
    print("Wrong position format")
else:
    char0IsNumber = position[0].isnumeric()
    char1IsSemiColumn = position[1] == ";"
    char2IsNumber = position[2].isnumeric()

    if not (char0IsNumber and char1IsSemiColumn and char2IsNumber):
        print("Wrong position format")
    else:
        posX = int(position[0])
        posY = int(position[2])

        if posX > 3 or posY > 3 or posX < 0 or posY < 0:
            print("Wrong position format")
        else:

            # Calculate Balook position
            result = ""
            balX = 0
            balY = 0

            for index in range(len(balook)):
                action = balook[index]
                if action == "R":
                    balX = balX + 1
                elif action == "L":
                    balX = balX - 1
                elif action == "U":
                    balY = balY - 1
                elif action == "D":
                    balY = balY + 1

            # Build and print the result
            if balX > 3 or balY > 3 or balX < 0 or balY < 0:
                result = "Balook is out of the grid"
            else:
                for line in range(4):
                    for column in range(4):
                        if column == posX and column == balX and line == posY
and line == balY:
                            result = result + "* "
                        elif column == posX and line == posY:
                            result = result + "P "
                        elif column == balX and line == balY:
                            result = result + "B "
                        else:
                            result = result + "0 "

```

```
        result = result + "\n"  
    print(result)
```


THURSDAY

WHAT YOUR PROGRAMM SHALL DO

- Enter 1 number (max) in the console

CONSOLE : console shall display : "Max number:"

- Print the **sum of the square numbers** from 1 to <max> (included)

CONSOLE : console shall display : "Sum of the squares is:"

EXAMPLES

INPUT	EXPLANATION
>Max: 4 > Sum of the squares is: 30	$1*1 + 2*2 + 3*3 + 4*4 = 30$
>Max: 2 > Sum of the squares is: 5	$1*1 + 2*2 = 5$

Q1 – What will be the result of this input?

>Max: 6

Q2 – Can you write **the steps of your algorithm** (complete this list of steps)

1. Enter max
2. ??

Q3 – Write your code

```
# Get the maximum value
maximum = int(input("Max= "))

# Compute the sum of squares
result = 0
for n in range (1:maximum+1):
    result = result + n*n

print("Sum of the square is: ", result)
```

FRIDAY

The problem of Syracuse

WHAT YOUR PROGRAMM SHALL DO

- Enter 1 number (number) in the console

- **CONSOLE** : console shall display : **Number:**
- This number must be greater than zero, otherwise print : **Number shall be positive**

If this number is even, we divide it by 2

If this number is odd, we multiply it by 3 and we add 1

We print this number, and we continue with the new number until this number is equal to 1

According to the "Syracuse conjecture", we should always finish by the number 1... let's see !

EXAMPLES

INPUT	EXPLANATION
> Number: 3 > 3, 10, 5, 16, 8, 4, 2, 1	3 is odd so next number is : $3 * 3 + 1 = 10$ 10 is even so next number is : $10 / 2 = 5$ 5 is odd so next number is : $5 * 3 + 1 = 16$... And we stop at 1
> Number: -4 > Number shall be positive	The number is not positive

Q1 – What will be the result of this input?

>Number: 3

Q2 – Can you write **the steps of your algorithm** (complete this list of steps)

1. Enter number
2. ??

Q3 – Write your code

```
# Get the number
number = int(input("Number= "))

# Build result
result = str(number) + ", "
if number < 0:
    result = "Number shall be positive"
else:
```

```
while number != 1:
    if number % 2 == 0:
        number = number / 2
    else:
        number = (number * 3) + 1
    result = result + str(int(number)) + ", "
print(result)
```