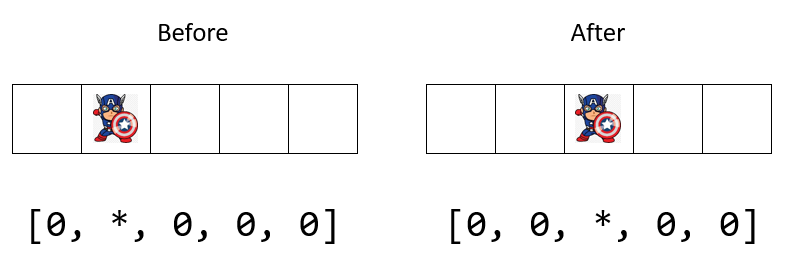
# C3-S5 – THE CAPTAIN AMERICA

**EXERCICE 1**

**PROBLEM:**

Captain America is represented by a star (\*) and empty cells are represented by a zero (0).

You need to move Captain America of one step on the right.



**INPUT**

* An array of 5 character (zero or \*)

*Note: Captain America is never on the last cell for this first exercise*

**OUPUT**

* The new array after you have moved Captain America on the right.

**Q1** – This program contains 2 mains steps; can you complete the description the 2 steps?

**Step 1**: Find the position of ……………………………………………

**Step 2**: Write 0 at the position of ……………………………………………. And write \* at the position of… ……………………………………………

**Q2** – Write the code on space below to complete step 1 and step 2

*TIPS: you should use a function to write this code*

*// your code*

arr = ["0","\*","0","0","0"]

def indexstar(arr):

    index = 0

    i = 0

    while i<len(arr) and arr[i]!="\*":

        i+=1

    index = i

    return index

star = indexstar(arr)

arr[star] = 0

arr[star+1] ="\*"

print(arr)

**Q3** – Share and discuss in groups of 3.

**Q4** – Code on your computer.

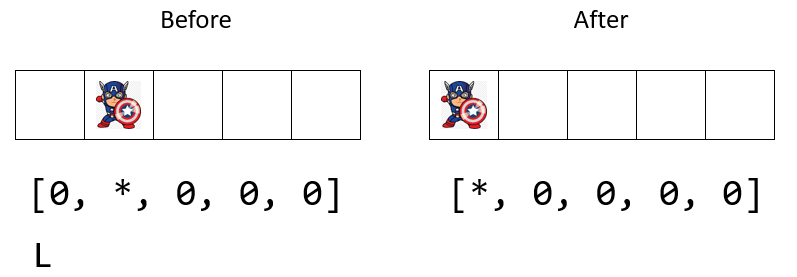
**EXERCICE 2**

**PROBLEM:**

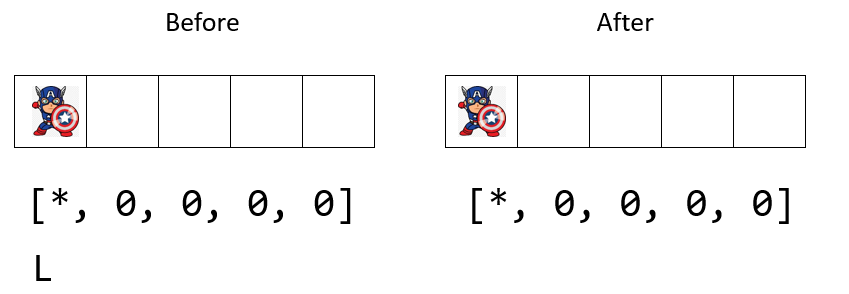
Now Captain America can move left or right, depending on the input direction.

This time:

* if Captain America in on the first cell, he cannot go left (he stays at the same position)
* if Captain America in on the last cell, he cannot go right (he stays at the same position)



*Here Captain America can go left*

**

*Here Captain America cannot go left So he stays at the same position*

**INPUT**

* An array of 5 character (zero or \*)
* Direction, a character (R or L)

**OUPUT**

* The new array after you have moved Captain America on left or right.

**Q1** – What do you need to update on your previous code?

* I need to…
* I need to…
* I need to…

**Q2** – Write the code on space below:

*// your code*

arr = ["0","\*","0","0","0"]

def indexstar(arr):

    index = 0

    i = 0

    while i<len(arr) and arr[i]!="\*":

        i+=1

    index = i

    return index

star = indexstar(arr)

arr[star] = 0

arr[star-1] ="\*"

print(arr)

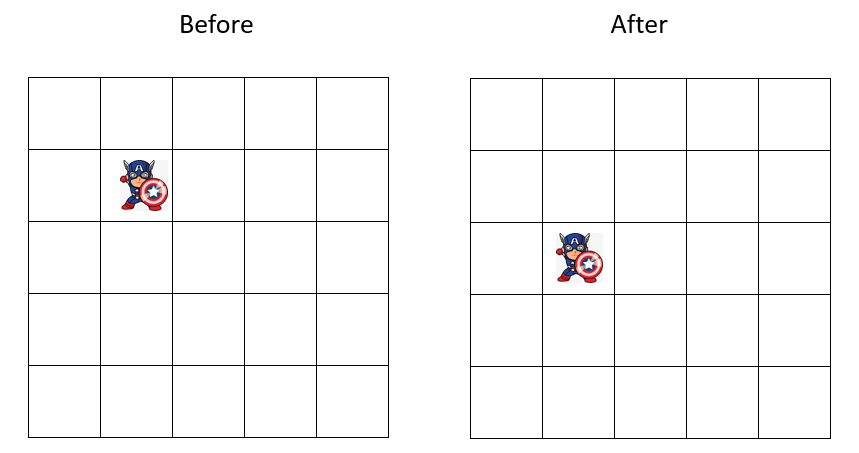
**Q3**– Share and discuss in groups of 3.

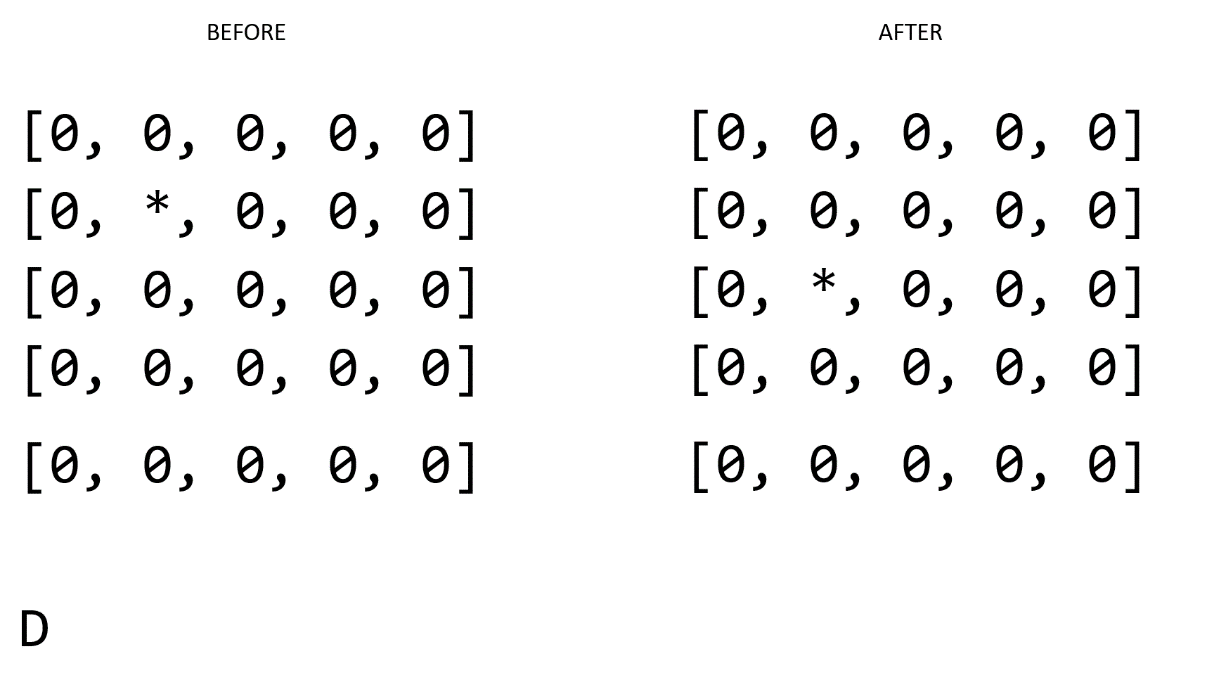
**Q4** – Code on your computer.

**EXERCICE 3**

**PROBLEM:**

Now Captain America can move left or right but also up and down!!

**

**

**INPUT**

* An array2D composed of (zero or \*)
* Direction, a character (R, L, U, D)

**OUPUT**

* The new array after you have moved Captain America on left or right and up or down.

**Q1** – What do you need to update on your previous code?

* I need to…
* I need to…
* I need to…

**Q2** – Write the code on space below:

*// your code*

arr = [["0","0","0","0","0"],

       ["0","\*","0","0","0"],

       ["0","0","0","0","0"],

       ["0","0","0","0","0",],

       ["0","0","0","0","0"]]

def instar(arr):

    index =0

    for i in range(len(arr)):

        for j in range(len(arr[i])):

            if arr[i][j] =="\*":

                index = j

    return index

def instarow(arr):

    row = 0

    for i in range(len(arr)):

        for j in range(len(arr[i])):

            if arr[i][j] =="\*":

                row = i

    return row

text = input()

for each in text:

    if each.upper()=="R":

        row = instarow(arr)

        index = instar(arr)

        arr[row][index]="0"

        arr[row][index+1]="\*"

    if each.upper()=="L":

        row = instarow(arr)

        index = instar(arr)

        arr[row][index]="0"

        arr[row][index-1]="\*"

    if each.upper()=="D":

        row = instarow(arr)

        index = instar(arr)

        arr[row][index]="0"

        arr[row+1][index]="\*"

    if each.upper()=="U":

        row = instarow(arr)

        index = instar(arr)

        arr[row][index]="0"

        arr[row-1][index]="\*"

print(arr)

**Q3** – Share and discuss in groups of 3.

**Q4** – Code on your computer.

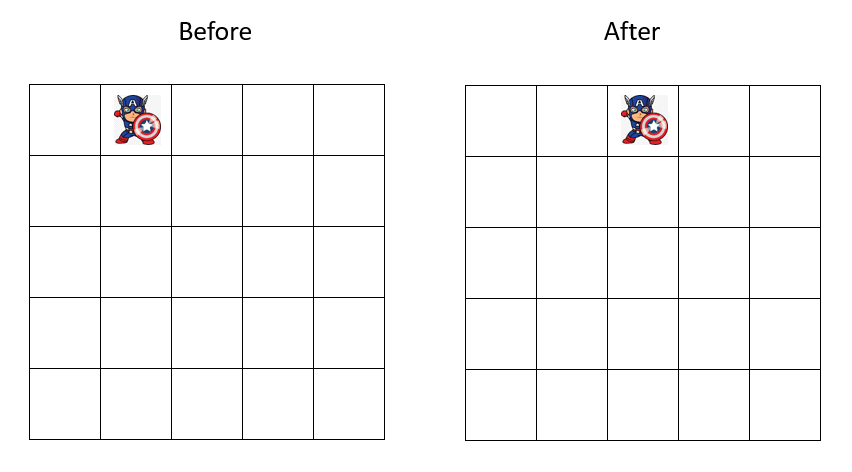
**EXERCICE 4**

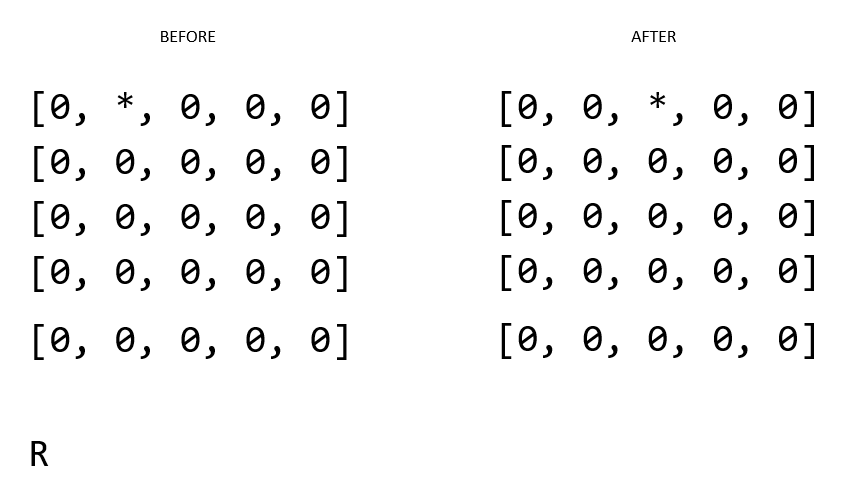
**PROBLEM:**

Now Captain America can move left or right but also up and down!!

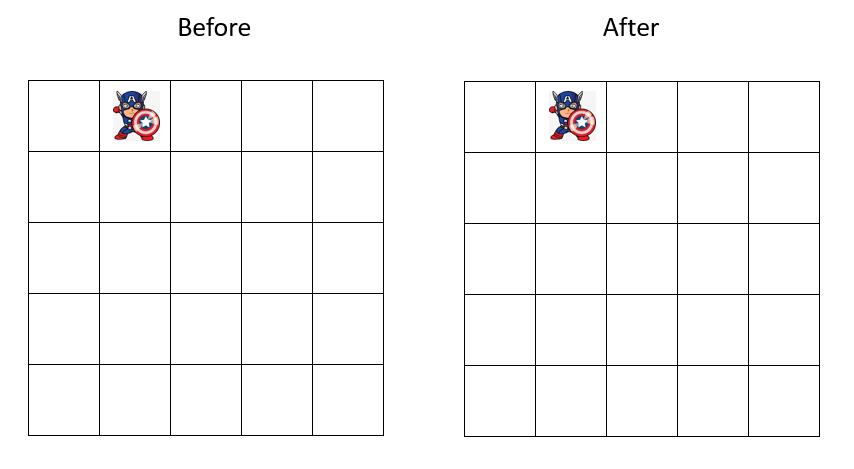
This time:

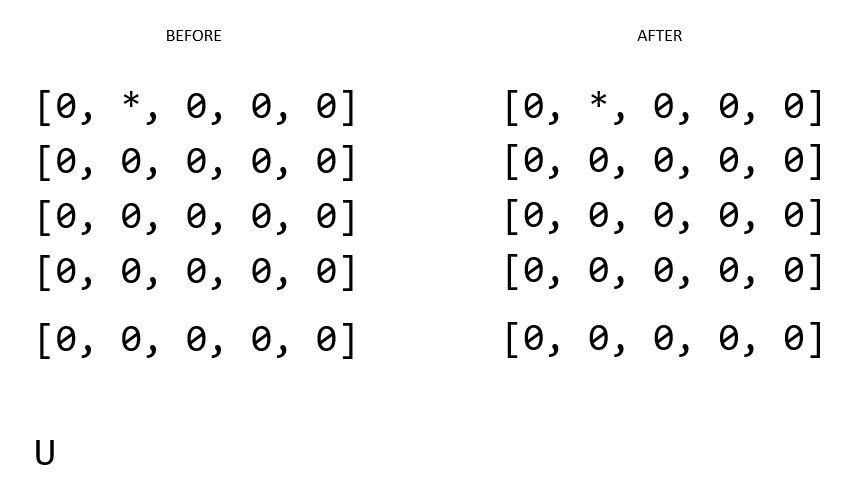
* if Captain America in on the first column, he cannot go left (he stays at the same position)
* if Captain America in on the last column, he cannot go right (he stays at the same position)
* if Captain America in on the first row, he cannot go up (he stays at the same position)
* if Captain America in on the last row, he cannot go down (he stays at the same position)





*Here Captain America can go right*





*Here Captain America cannot go up So he stays at the same position*

**INPUT**

* An array2D composed of (zero or \*)
* Direction, a character (R, L, U, D)

**OUPUT**

* The new array after you have moved Captain America on left or right and up or down.

**Q1** – What do you need to update on your previous code?

* I need to…
* I need to…
* I need to…

**Q2** – Write the code on space below:

*// your code*

arr = [["0","\*","0","0","0"],

       ["0","0","0","0","0"],

       ["0","0","0","0","0"],

       ["0","0","0","0","0",],

       ["0","0","0","0","0"]]

def instar(arr):

    index =0

    for i in range(len(arr)):

        for j in range(len(arr[i])):

            if arr[i][j] =="\*":

                index = j

    return index

def instarow(arr):

    row = 0

    for i in range(len(arr)):

        for j in range(len(arr[i])):

            if arr[i][j] =="\*":

                row = i

    return row

text = input()

for each in text:

    if each.upper()=="R":

        row = instarow(arr)

        index = instar(arr)

        arr[row][index]="0"

        arr[row][index+1]="\*"

    elif each.upper()=="L":

        row = instarow(arr)

        index = instar(arr)

        arr[row][index]="0"

        arr[row][index-1]="\*"

    elif each.upper()=="D":

        row = instarow(arr)

        index = instar(arr)

        arr[row][index]="0"

        arr[row+1][index]="\*"

    elif each.upper()=="U":

        row = instarow(arr)

        index = instar(arr)

        arr[row][index]="0"

        arr[row-1][index]="\*"

print(arr)

**Q3** – Share and discuss in groups of 3.

**Q4** – Code on your computer.