

## 0.1 Note:

- This notebook will be graded **automatically**, you need to follow these guidelines to obtain your grade.
- Before you turn this problem in, make sure everything runs as expected. First, **restart the kernel** (in the menubar, select Kernel→Restart) and then **run all cells** (in the menubar, select Cell→Run All).
- Don't edit or remove the line that starts with `%%code`.**
- Remove the line contains `raise NotImplementedError()` and replace it by your code.**
- Make sure your program output matches the sample runs given. If the sample run for example prints 'Two', your code must print the same NOT '2'.**
- Don't rename the notebook and don't compress it. Only submit the same notebook HW2.ipynb.**

Make sure you fill in any place that says YOUR CODE HERE or "YOUR ANSWER HERE", as well as your name and ID below:

In [1]:

1

## 1 ICS 104

### 2 HW 2 (35 points)

In [2]:

```
1 #don't modify the content of this cell just run it
2 from IPython.core.magic import (register_line_magic,
3                                 register_cell_magic)
4
5 _store = {}
6 ip = get_ipython()
7 @register_cell_magic
8 def code(line, cell):
9     _store[line.strip()]=cell
10    ip.run_cell(cell)
```

### 2.1 Question 1 (5 points):

Write Python code for a logical variable xor that receives 2 input conditions A and B and returns the computed output value (xor), according to the following table:

A	B	xor
0	0	0
0	1	1
1	0	1
1	1	0

You should allow for the user to input the 0 or 1 values of the input variables A and B. You do not need to check the validity of the input. The variable xor should have either a 0 or 1 value after the execution of your program, according to the table, above.

Sample run	Sample run
Condition A = 0 Condition B = 1 XOR is 1	Condition A = 1 Condition B = 1 XOR is 0

In [3]:

```
1 %%code q1
2 # YOUR CODE HERE
3 A = int(input("Condition A = "))
4 B = int(input("Condition B = "))
5 if A==0 and B==0 or A==1 and B==1:
6     print("XOR is 0")
7
8 elif A==0 and B==1 or A==1 and B==0:
9     print("XOR is 1")
```

Condition A = 1  
Condition B = 0  
XOR is 1

In [4]:

1 #DON'T MOVE OR REMOVE THIS CELL

In [5]:

1 #DON'T MOVE OR REMOVE THIS CELL

### 2.2 Question 2 (9 points):

A bookstore awards coupons depending on how much a customer spends on books. For example, if you spend 90, you will get a coupon worth 10% of that amount. The following table shows the percent used to calculate the coupon awarded for different amounts spent. Write a program that calculates and prints the value of the coupon a person can receive based on books purchased or prints no coupon if the amount paid is less than 10.

Amount paid on books	Coupon percentage
Less than 10	No Coupon
From 10 to 80	8%
More than 80 to 150	10%
More than 150 to 250	12%
More than 250	14%

Sample run	sample run
Enter the cost of your books: 20 You win a discount coupon of 1.6	Enter the cost of your books: 8 No Coupon

In [6]:

```
1 %%code q2
2 # YOUR CODE HERE
3 cost = float(input("Enter the cost of your books: "))
4 if cost > 10:
5     if 10 <= cost <= 80:
6         disCount = cost * 0.08
7     elif 80 < cost <= 150:
8         disCount = cost * 0.1
9     elif 150 < cost <= 250:
10        disCount = cost * 0.12
11    else:
12        disCount = cost * 0.14
13    print("You win a discount coupon of %.1f" % disCount)
14
15 else:
```

```
16     print("No Coupon")
17
```

Enter the cost of your books: 260  
You win a discount coupon of 36.4

In [7]: 1 #DON'T MOVE OR REMOVE THIS CELL

In [8]: 1 #DON'T MOVE OR REMOVE THIS CELL

In [9]: 1 #DON'T MOVE OR REMOVE THIS CELL

In [10]: 1 #DON'T MOVE OR REMOVE THIS CELL

## 2.3 Question 3 (11 points):

Write a program that reads three integers n1, n2 and n3 and prints "Integers are different" if the integers are different, then it prints "The integers are increasing" if  $n1 < n2 < n3$  or "The integers are decreasing" if  $n1 > n2 > n3$ . If they are not different then the program prints either "two integers are the same" or "All integers are the same"

Sample run	Sample run	Sample run
Enter the first integer 1 Enter the second integer 3 Enter the third integer 1 Two integers are the same	Enter the first integer 5 Enter the second integer 10 Enter the third integer 25 The integers are different The integers are increasing	Enter the first integer 4 Enter the second integer 9 Enter the third integer 2 The integers are different

```
In [11]: 1 %%code q3
2 # YOUR CODE HERE
3 n1 = int(input("Enter the first integer "))
4 n2 = int(input("Enter the second integer "))
5 n3 = int(input("Enter the third integer "))
6
7 if n1==n2 and n2==n3 and n1==n3:
8     print("The integes are different")
9     if n1 < n2 < n3:
10        print("The integers are increasing")
11        if n1 > n2 > n3:
12            print("The integers are decreasing")
13    elif n1==n2 and n2==n3 and n1==n3:
14        print("All integers are the same")
15
16 else:
17     print("Two integers are the same")
18
```

Enter the first integer 1  
Enter the second integer 2  
Enter the third integer 3  
The integes are different  
The integers are increasing

In [12]: 1 #DON'T MOVE OR REMOVE THIS CELL

In [13]: 1 #DON'T MOVE OR REMOVE THIS CELL

In [14]: 1 #DON'T MOVE OR REMOVE THIS CELL

In [15]: 1 #DON'T MOVE OR REMOVE THIS CELL

In [16]: 1 #DON'T MOVE OR REMOVE THIS CELL

## 2.4 Question 4 (10 points):

Write a python program that asks the user about their emails and then check the following:

- the entered email is a valid email address (email format is [USERNAME]@[ORGANIZATION].[DOMAIN]. i.e. it should have '@' followed by organization name then at least one '.' and domain)
- determine if the entered email is a KFUPM email or not (KFUPM emails ends with @kfupm.edu.sa)
- if the entered email is a valid KFUPM email, determine if it is a freshman student email or not (assume all freshman students have ID numbers starts with s2019 and the student ID length is 9 digits)

Sample run	Sample run	Sample run
write your email address: s201999990@kfupm.edu.sa The email address is Valid The entered email is a KFUPM email The entered email is a freshman student email	write your email address: ics@104. The entered email is not valid	write your email address: ics104@kfupm.sa The email address is Valid

```
In [17]: 1 %%code q4
2 # YOUR CODE HERE
3 email = input("write your email address: ")
4 if "@" in email and email.count("@") == 1 and not " " in email:
5     AT = email.find("@")
6     restOfemail = email[AT:]
7     userName = email[:AT]
8     if "." in restOfemail :
9         DOT = restOfemail.find(".")
10        AT2 = restOfemail.find("@")
11        organization = restOfemail[AT2:DOT]
12        DOMAIN = restOfemail[DOT:]
13        if len(organization) > 1 and len(userName) > 0 and len(DOMAIN)>1:
14            print("The email address is Valid")
15            if email.endswith("@kfupm.edu.sa"):
16                print("The entered email is a KFUPM email")
17
18                if email.startswith("s2019") and len(email[:AT]) == 10 and email[1:AT].isdigit():
19                    print("The entered email is a freshman student email")
20
21            else:
22                print("The entered email is not valid")
23
24        else:
25            print("The entered email is not valid")
26
27    else:
28        print("The entered email is not valid")
```

write your email address: s201939410@kfupm.edu.sa  
The email address is Valid  
The entered email is a KFUPM email  
The entered email is a freshman student email

In [18]: 1 #DON'T MOVE OR REMOVE THIS CELL  
2

In [19]: 1 #DON'T MOVE OR REMOVE THIS CELL

In [20]: 1 #DON'T MOVE OR REMOVE THIS CELL

In [21]: 1 #DON'T MOVE OR REMOVE THIS CELL