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1 ICS 104 - Introduction to Programming in Python and C

1.1 Decision Structures - Lab 2

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2 Lab Learning Outcomes

- To learn how to program simple and complex decisions.
- To implement decisions using if statements
- To write statements using Boolean expressions
- To validate user input

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- Exercise# 1: Write a program that reads a temperature value and the letter C for Celsius or F for Fahrenheit. Print whether water is liquid, solid, or gaseous at the given temperature at sea level.

In [6]:

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```python
# Exercise # 1 - Source Codet

temp = float(input("Enter the temperature value: "))
tempKind = input("Enter the temperature kind (F or C) :  ")
if tempKind == "F" or tempKind == "f" :
    if temp <= 32 :
        print("Water is Solid")
    elif temp < 212 :
        print("Water is Liquid")
    else:
        print("Water is Gaseous")
elif tempKind == "C" or tempKind == "c":
    if temp <= 0 :
        print("Water is Solid")
    elif temp < 100:
        print("Water is Liquid")
    else:
        print("Water is Gaseous")
else :
    print("Error , please enter F or C")

```

```
Enter the temperature value: 100
Enter the temperature kind (F or C) :  C
Water is Gaseous
```

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- Exercise# 2: A supermarket awards coupons depending on how much a customer spends on groceries. For example, if you spend $50, you will get a coupon worth eight percent 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 groceries purchased. A sample run is as follows:

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```
Please enter the cost of your groceries: 14
You win a discount coupon of $ 1.12. (8% of your purchase)
```

Money Spent	Coupon Percentage
Less than $10	No coupon
From $10 to $60	8%
More than $60 to $150	10%
More than $150 to $210	12%
More than $210	14%

In [5]:

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```python
# Exercise # 2 - Source Code
moneySpent = float(input("Please Enter the cost of your groceries:  "))
if moneySpent < 10:
    discount = 0
    print("No discount coupon")
else:
    if moneySpent >= 10 and moneySpent <= 60:
        discount = moneySpent * 0.08
        discountValue="(8% of your purchase)"
    elif moneySpent <= 150:
        discount = moneySpent * 0.1
        discountValue="(10% of your purchase)"
    elif moneySpent <= 210:
        discount = moneySpent * 0.12
        discountValue="(12% of your purchase)"
    else:
        discount = moneySpent * 0.14
        discountValue="(14% of your purchase)"
    print("You Win a discount coupon of $ %0.2f " % discount ,discountValue)
```

```
Please Enter the cost of your groceries:  210
You Win a discount coupon of $ 25.20  (12% of your purchase)
```

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- Exercise# 3: Write a program that asks the user to enter a month (1 for January, 2 for February, and so on) and then prints the number of days in the month. For February, print "28 or 29 days".
  - Enter a month:5 30 days
  - Do not use a separate if/else branch for each month. Use Boolean operators.

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```python
# Exercise # 3 - Source Code
num = int(input("Enter a month: "))
if num ==1 or num==3 or num==5 or num==7 or num==8 or num==10 or num==12:
    print("The month has 31 days")
elif num !=2 and num<12 and num>0:
    print("The month has 30 days")
elif num ==2:
    print("The month has 29 or 28 days")
else:
```

```
10        print("Error, Enter a number between 1 and 12 ")
```

```
Enter a month: 2
The month has 29 or 28 days
```

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- Exercise# 4: Write a program that prompts the user to provide a single character from the alphabet. Print Vowel or Consonant, depending on the user input. If the user input is not a letter (between a and z or A and Z), or is a string of length > 1, print an error message.

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```python
1  # Exercise # 4 - Source Code
2  Input = input("Enter the letter: ")
3  if len(Input) > 1 or not Input.isalpha():
4      print("Error, Please enter a single letter")
5  else:
6      letter = Input.upper()
7      if letter=="A" or letter=="E" or letter=="I" or letter=="O" or letter=="U":
8          print("The letter is a Vowel")
9      else:
10         print("The letter is Consonant")
11
12
```

```
Enter the letter: ?
Error, Please enter a single letter
```

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