**PIAIC Python First Class¶**

**Task**

1. implementation of Five Python pre-Defined Functions
2. Student ID Card
3. Result Card

# Implementation of Five Python pre-Defined Functions

In [19]:

*##bin() converts an integer to a binary string.*

print("Please Enter Decimal Number you want to convert in Binary ")

user\_number=int(input())

reslt=bin(user\_number)

print(user\_number," into Binary = ",reslt)

Please Enter Decimal Number you want to convert in Binary

11333

11333 into Binary = 0b10110001000101

In [18]:

*##chr() Built In function returns the character in python for an ASCII value.*

user\_input=int(input("Please Enter interger Code To convert into ASCII "))

asci\_val=chr(user\_input)

print(asci\_val)

Please Enter interger Code To convert into ASCII 75

K

In [15]:

**class** **Calculator**:

**def** addition(self,num1,num2):

ans=num1+num2

*##float() This Python Built In function converts an int or a compatible value into a float*

anss=float(ans)

print("Result = ",anss)

**def** subtract(self,num1,num2):

ans=num1-num2

*##float() This Python Built In function converts an int or a compatible value into a float*

anss=float(ans)

print("Result = ",anss)

**def** multiply(self,num1,num2):

ans=num1\*num2

*##float() This Python Built In function converts an int or a compatible value into a float*

anss=float(ans)

print("Result = ",anss)

**def** division(self,num1,num2):

ans=num1/num2

*##float() This Python Built In function converts an int or a compatible value into a float*

anss=float(ans)

print("Result = ",anss)

*##classmethod() returns a class method for a given method.*

Calculator.addition=classmethod(Calculator.addition)

*##classmethod() returns a class method for a given method.*

Calculator.subtract=classmethod(Calculator.subtract)

*##classmethod() returns a class method for a given method.*

Calculator.multiply=classmethod(Calculator.multiply)

*##classmethod() returns a class method for a given method.*

Calculator.division=classmethod(Calculator.division)

description="""

For Addition Press 1

For Subtraction Press 2

For Multiplication Press 3

For Division Press 4

"""

print(description)

choice=int(input("Enter you Choice"))

**if** choice==1:

num1=int(input("Enter First Number ="))

num2=int(input("Enter Second Number ="))

Calculator.addition(num1,num2)

**elif** choice==2:

num1=int(input("Enter First Number ="))

num2=int(input("Enter Second Number ="))

Calculator.subtract(num1,num2)

**elif** choice==3:

num1=int(input("Enter First Number ="))

num2=int(input("Enter Second Number ="))

Calculator.multiply(num1,num2)

**elif** choice==4:

num1=int(input("Enter First Number ="))

num2=int(input("Enter Second Number ="))

Calculator.division(num1,num2)

**else** :

print("Enter Interger Number between 0 to 4")

For Addition Press 1

For Subtraction Press 2

For Multiplication Press 3

For Division Press 4

Enter you Choice1

Enter First Number =3

Enter Second Number =3

Result = 6.0

# Student ID Card

In [16]:

timeings=input("Enter your Time")

name=input("Enter Name")

f\_nmae=input("Entre Father Nmae")

uni=input("Enter University")

message="""

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TIMING: **{}**

NAME: **{}**

Father's Nmae: **{}**

University: **{}**

"""

*##format() Formats a specified value*

message=message.format(timeings,name,f\_nmae,uni)

print(message)

Enter your Time3:30 to 6:30

Enter NameMuhammad Saif Ul Azeem

Entre Father NmaeMuhammad Azeem

Enter UniversityNational university of Modern Languages

PIAIC ISLAMABAD BATCH3

TIMING: 3:30 to 6:30

NAME: Muhammad Saif Ul Azeem

Father's Nmae: Muhammad Azeem

University: National university of Modern Languages

# Result Card

In [13]:

s\_name=input("Enter Student Name ")

fthr\_name=input("Enter Father Name")

phys=int(input("Enter Physics Marks Out of 100 :"))

**if** phys>100:

print("Please Enter Marks Out of 100 ")

phys=0

**else** :

phys=phys

chem=int(input("Enter Chemistry Marks Out of 100 :"))

**if** chem>100:

print("Please Enter Marks Out of 100 ")

chem=0

**else** :

chem=chem

maths=int(input("Enter Maths Marks Out of 100 :"))

**if** maths>100:

print("Please Enter Marks Out of 100 ")

maths=0

**else** :

maths=maths

eng=int(input("Enter English Marks Out of 100 :"))

**if** eng>100:

print("Please Enter Marks Out of 100 ")

eng=0

**else** :

eng=eng

urdu=int(input("Enter Urdu Marks Out of 100 :"))

**if** urdu>100:

print("Please Enter Marks Out of 100 ")

urdu=0

**else** :

urdu=urdu

marks\_obt=phys+chem+maths+eng+urdu

prsnt=(marks\_obt\*100)/500

msg="""NUML

Fall 2019

Nmae: **{}**

Father's Name:**{}**

phy:**{}**

Che:**{}**

mat:**{}**

eng:**{}**

Urdu:**{}**

Total:**{}**

Percentage % :**{}**

"""

msg=msg.format(s\_name,fthr\_name,phys,chem,maths,eng,urdu,marks\_obt,prsnt)

print(msg)

Enter Student Name Muhammad Saif

Enter Father NameMuhammad Azim

Enter Physics Marks Out of 100 :110

Please Enter Marks Out of 100

Enter Chemistry Marks Out of 100 :90

Enter Maths Marks Out of 100 :89

Enter English Marks Out of 100 :78

Enter Urdu Marks Out of 100 :78

NUML

Fall 2019

Nmae: Muhammad Saif

Father's Name:Muhammad Azim

phy:0

Che:90

mat:89

eng:78

Urdu:78

Total:335

Percentage % :67.0

myList = [12,34,55,56, -12]

print(myList)

*#max function will return Largest Value in the List*

print(max(myList))

*#min function will return Smallest Value in the List*

print(min(myList))

*#abs function will return Absolute Value of the number*

print(abs(myList[4]))

num1 = int(input("Enter 1st number: "))

num2 = int(input("Enter 2nd number: "))

print("a. Add**\n**b. Sub**\n**c. Mul**\n**")

ch = input("Enter choice: ")

**if** ch=="a":

print(num1+num2)

**elif** ch =="b":

print(num1-num2)

**elif** ch =="c":

print(num1\*num2)

**else**:

print("Wrong Choice")

[12, 34, 55, 56, -12]

56

-12

12

Enter 1st number: 12

Enter 2nd number: 21

a. Add

b. Sub

c. Mul

Enter choice: b

-9

# Creating a frame using a dictionary

In [171]:

scores = {"Ai for EO":[10,89,87,81,76,78,79,90,71,67],

"Python1": [67,87,56,5,81,90,67,45,98,67],

"Python2": [78,89,76,78,56,98,40,71,70,45]

}

In [172]:

df = pd.DataFrame(scores, index=["Ali","Ahmed", "Nasir","Asad","Khan","Saad",

"Fahad","Usman","Talha","Fazal"])

df

Out[172]:

|  | **Ai for EO** | **Python1** | **Python2** |
| --- | --- | --- | --- |
| **Ali** | 10 | 67 | 78 |
| **Ahmed** | 89 | 87 | 89 |
| **Nasir** | 87 | 56 | 76 |
| **Asad** | 81 | 5 | 78 |
| **Khan** | 76 | 81 | 56 |
| **Saad** | 78 | 90 | 98 |
| **Fahad** | 79 | 67 | 40 |
| **Usman** | 90 | 45 | 71 |
| **Talha** | 71 | 98 | 70 |
| **Fazal** | 67 | 67 | 45 |

In [1]:

*# 'Print' => Prints the Given Object*

print('Hello Folks')

Hello Folks

In [2]:

*# 'Input' => reads and returns a line of string*

name = input('Enter your Name: ')

print("Hello "+name)

Enter your Name: afnan

Hello afnan

In [3]:

*#'len' => Returns Length of an Object*

print(len('Afnan Arshad'))

12

In [5]:

*#'round' => Rounds a numbers*

print(round(3.49))

print(round(3.50))

3

4

In [ ]:

*#'min' => Returns the smallest item in an iterable*

print(min([20,30,60,10,70]))

In [ ]:

# 5 Built-In-Functions of Python

# (1) Abs Function

# The abs() function is used to get the absolute (positive) value of a given number.

In [1]:

abs(-7)

Out[1]:

7

In [2]:

abs(250)

Out[2]:

250

In [3]:

abs(-2033.35)

Out[3]:

2033.35

# (2) Bin Function

# Convert an integer number to a binary string prefixed with “0b”.

In [4]:

bin(3)

Out[4]:

'0b11'

In [5]:

bin(-654)

Out[5]:

'-0b1010001110'

In [6]:

bin(250)

Out[6]:

'0b11111010'

# (3) Eval Function

# The eval() function evaluates the specified expression, if the expression is a legal Python statement, it will be executed.

In [7]:

x=1

In [9]:

eval('x+1')

Out[9]:

2

In [10]:

x=1

In [11]:

eval('x-1')

Out[11]:

0

In [12]:

x=1

In [14]:

eval('x\*1')

Out[14]:

1

In [15]:

x=1

In [16]:

eval('x/1')

Out[16]:

1.0

# (4) Oct Function

# Convert an integer number to an octal string prefixed with “0o”.

In [17]:

oct(8)

Out[17]:

'0o10'

In [18]:

oct(-56)

Out[18]:

'-0o70'

In [20]:

oct(20)

Out[20]:

'0o24'

# (5) Chr Function

# Return the string representing a character whose Unicode code point is the integer.

In [35]:

chr(37)

Out[35]:

'%'

In [37]:

chr(55)

Out[37]:

'7'

In [38]:

chr(87)

Out[38]:

'W'

# Calculate Percentage

In [2]:

name = input("Enter Your Name")

father\_name = input("Enter your Father's name")

uni = input("University")

message = """

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Name : **{}**

Father\_Name: **{}**

University: **{}**

"""

message1 = message.format(name, father\_name, uni)

print(message1)

print("Enter marks obtained in 5 subjects: ");

m1 = input();

**if** m1 == 'x':

exit();

**else**:

m2 = input();

m3 = input();

m4 = input();

m5 = input();

English = int(m1);

Urdu = int(m2);

Islamiyat = int(m3);

Maths=int(m4);

ComputerScience=int(m5);

sum = English + Urdu + Islamiyat + Maths + ComputerScience;

average = sum/5;

percentage = (sum/500)\*100;

print("Percentage Marks = ", percentage,"%");

Enter Your Name M Ali

Enter your Father's name M Arif

University Bahria University

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Name : M Ali

Father\_Name: M Arif

University: Bahria University

Enter marks obtained in 5 subjects:

82

75

67

85

92

Percentage Marks = 80.2 %

# Create a Dynamic Marksheet

In [5]:

uni = input("University :")

fall = input("Fall ")

name = input("Enter Your Name :")

father\_name = input("Enter your Father's name :")

phy = input("Enter Physics Marks = ")

chem = input("Enter Chemistry Marks = ")

maths = input("Enter Maths Marks = ")

comp = input("Enter Computer Marks= ")

print ("--------------------------------------------")

print("**\t** **\033**[5m PIAIC ISLAMABAD BATCH 3 ")

print ("--------------------------------------------")

total = int(phy) + int(chem) +int(maths) +int(comp)

per\_age = total / 400 \* 100

message = """

University: **{}**

Fall : **{}**

Name : **{}**

Father\_Name: **{}**

**\t** --------------------------

**\t** DETAILED MARKS CERTIFICATE

**\t** --------------------------

Physics : **{}**

Chemistry : **{}**

Maths : **{}**

Computer : **{}**

Total : **{}**

Percentage : **{}**

"""

message1 = message.format(uni, fall, name, father\_name, phy, chem, maths, comp, total, per\_age )

print(message1)

University :Bahria University

Fall 2019

Enter Your Name :Afshan

Enter your Father's name :Jamil

Enter Physics Marks = 99

Enter Chemistry Marks = 89

Enter Maths Marks = 90

Enter Computer Marks= 88

--------------------------------------------

PIAIC ISLAMABAD BATCH 3

--------------------------------------------

University: Bahria University

Fall : 2019

Name : Afshan

Father\_Name: Jamil

--------------------------

DETAILED MARKS CERTIFICATE

--------------------------

Physics : 99

Chemistry : 89

Maths : 90

Computer : 88

Total : 366

Percentage : 91.5

**Question No. 1: Calculate Area of a Circle**

Write a Python program which accepts the radius of a circle from the user and compute the area.

In [1]:

radius = float(input("Input Radius: "))

area = 3.141592654 \* (radius\*\*2)

print('Area of Circle with radius **{0}** is **{1}**'.format(radius, area))

Input Radius: 0.5

Area of Circle with radius 0.5 is 0.7853981635

**Question No. 2: Check Number either positive, negative or zero**

Write a Python program to check if a number is positive, negative or zero

In [2]:

num = int(input('Enter Integer: '))

**if** num < 0:

print('Negative Number Entered')

**elif** num > 0:

print('Positive Number Entered')

**else**:

print('Zero Entered')

Enter Integer: 3

Positive Number Entered

**Question No. 3: Divisibility Check of two numbers**

Write a Python program to check whether a number is completely divisible by another number. Accept two integer values form the user

In [3]:

num = int(input('Enter Neumerator: '))

den = int(input('Enter Denominator: '))

**if** num%den == 0:

print('Number **{0}** is fully divisible by **{1}**.'.format(num, den))

**else**:

print('Number **{0}** is not fully divisible by **{1}**.'.format(num, den))

Enter Neumerator: 25

Enter Denominator: 5

Number 25 is fully divisible by 5.

**Question No. 4: Days Calculator**

Write a Python program to calculate number of days between two dates

In [4]:

**import** **datetime**

date1 = datetime.datetime.strptime(input("Enter a date in (dd/mm/yyyy) format: "), '**%d**/%m/%Y')

date2 = datetime.datetime.strptime(input("Enter a date in (dd/mm/yyyy) format: "), '**%d**/%m/%Y')

print(f"There are {abs((date1 - date2).days)} days between {date1.strftime('**%d**/%m/%Y')} and {date2.strftime('**%d**/%m/%Y')}")

Enter a date in (dd/mm/yyyy) format: 12/12/2018

Enter a date in (dd/mm/yyyy) format: 16/12/2018

There are 4 days between 12/12/2018 and 16/12/2018

**Question No. 5: Calculate Volume of a sphere**

Write a Python program to get the volume of a sphere, please take the radius as input from user

In [5]:

rad = float(input("Enter Radius of Sphere"))

vol = (4/3) \* 3.142 \* (rad \*\* 3)

print(f"Volume of sphere: {format(vol, '.2f')}")

Enter Radius of Sphere2

Volume of sphere: 33.51

**Question No. 6: Copy string n times**

Write a Python program to get a string which is n (non-negative integer) copies of a given string.

In [6]:

instr = input("Enter string: ")

count = int(input("How many copies of string you need: "))

print(f"**{count}** copies of **{instr}** are {instr\*count}")

Enter string: Hi

How many copies of string you need: 5

5 copies of Hi are HiHiHiHiHi

**Question No. 7: Check if number is Even or Odd**

Write a Python program to find whether a given number (accept from the user) is even or odd, print out an appropriate message to the user

In [7]:

num = int(input("Enter number: "))

**if** num % 2 == 0:

print(f"**{num}** is Even")

**else**:

print(f"**{num}** is Odd")

Enter number: 58

58 is Even

**Question No. 8: Vowel Tester**

Write a Python program to test whether a passed letter is a vowel or not

In [8]:

alpha = input("Enter a character: ")

mylist = {'a', 'e', 'i', 'o', 'u'}

**if** alpha.lower() **in** mylist:

print(f"**{alpha}** is Vowel")

**else**:

print(f"**{alpha}** is not Vowel")

Enter a character: a

a is Vowel

**Question No. 9: Triangle area**

Write a Python program that will accept the base and height of a triangle and compute the area

In [9]:

base = float(input('Enter magnitude of Triangle base: '))

height = float(input('Enter Magnitude of Triangle Height: '))

area = 0.5 \* base \* height

print(f"Area of a Triangle with Height **{height}** and Base **{base}** is { format(area, '.2f') }")

Enter magnitude of Triangle base: 45

Enter Magnitude of Triangle Height: 10

Area of a Triangle with Height 10.0 and Base 45.0 is 225.00

**Question No. 10: Calculate Interest**

Write a Python program to compute the future value of a specified principal amount, rate of interest, and a number of years

In [10]:

p\_amount = float(input("Please enter principal amount: "))

rate = float(input("Please Enter Rate of interest in %: "))

year = int(input("Enter number of years for investment: "))

final = p\_amount

**for** \_ **in** range(year):

final += final \* (rate)

print(f'After **{year}** years your principal amount **{p\_amount}** over an interest rate of **{rate}** % will be **{final}**')

Please enter principal amount: 10000

Please Enter Rate of interest in %: 0.1

Enter number of years for investment: 5

After 5 years your principal amount 10000.0 over an interest rate of 0.1 % will be 16105.1

**Question No. 11: Euclidean distance**

Write a Python program to compute the distance between the points (x1, y1) and (x2, y2).

In [11]:

x1 = int(input('Enter Co-ordinate for x1: '))

x2 = int(input('Enter Co-ordinate for x2: '))

y1 = int(input('Enter Co-ordinate for y1: '))

y2 = int(input('Enter Co-ordinate for y2: '))

dist = ((x2 - x1) \*\* 2 + (y2 -y1) \*\* 2) \*\* (1/2)

print(f'Distance between points (**{x1}**, **{y1}**) and (**{x2}**, **{y2}**) is **{dist}**')

Enter Co-ordinate for x1: 2

Enter Co-ordinate for x2: 4

Enter Co-ordinate for y1: 4

Enter Co-ordinate for y2: 4

Distance between points (2, 4) and (4, 4) is 2.0

**Question No. 12: Feet to Centimeter Converter**

Write a Python program to convert height in feet to centimeters.

In [12]:

feet = int(input ('Enter Height in Feet: '))

centi = feet \* 30.48

print(f'There are **{centi}** Cm in **{feet}** ft')

Enter Height in Feet: 55

There are 1676.4 Cm in 55 ft

**Question No. 13: BMI Calculator**

Write a Python program to calculate body mass index

In [13]:

height = float(input("Enter Height in Cm: "))/100

weight = float(input("Enter Weight in Kg: "))

bmi = (weight / (height \*\* 2) )

print(f'Your BMI is **{bmi: .2f}**')

Enter Height in Cm: 180

Enter Weight in Kg: 75

Your BMI is 23.15

**Question No. 14: Sum of n Positive Integers**

Write a python program to sum of the first n positive integers

In [14]:

num = int(input('Enter value of n: '))

mylist = list(range(num+1))

listsum = sum(mylist)

print(f'Sum of n Positive integers till **{num}** is **{listsum}**')

Enter value of n: 5

Sum of n Positive integers till 5 is 15

**Question No. 15: Digits Sum of a Number**

Write a Python program to calculate the sum of the digits in an integer

In [15]:

num\_str = input("Enter a number: ")

summ = 0

print('Sum of ', end = '')

**for** i **in** range(len(num\_str)):

summ += int(num\_str[i])

print(f'**{num\_str[i]}** ', end = '')

**if** i != len(num\_str) - 1:

print('+ ', end = '')

print(f'is **{summ}**')

Enter a number: 55

Sum of 5 + 5 is 10

**Qusetion No. 16: Decimal to Binary Converter**

Write a Python program to convert an decimal integer to binary

In [16]:

decimal = int(input('Enter a decimal number: '))

temp = decimal

binary = []

**while** (temp>0):

a=int(float(temp%2))

binary.append(a)

temp=(temp-a)/2

print(f'Binary Representation of **{num}** is ', end = '')

**for** i **in** binary[::-1]:

print(i, end = '')

Enter a decimal number: 37

Binary Representation of 5 is 100101

**Question No. 17: Binary to Decimal Converter**

Write a program to convert binary number to Decimal number

In [17]:

binary = input('Enter a Binary number: ')

binary = binary[::-1]

val = 0

**for** i **in** range(len(binary)):

**if** binary[i] == '1':

val += pow(2, i)

print(f'Decimal Representation of **{binary[::-1]}** is **{val}**')

Enter a Binary number: 1001

Decimal Representation of 1001 is 9

**Question No. 18: Vowel and Consonants Counter**

Input a text and count the occurrences of vowels and consonant

In [18]:

string = input('Enter text: ')

vowel\_list = ['a', 'e', 'i', 'o', 'u']

vowels = 0

consonants = 0

**for** i **in** string:

**if** i.lower() **in** vowel\_list:

vowels += 1

**else**:

consonants += 1

print(f'Vowels: **{vowels}**')

print(f'Consonants: **{consonants}**')

Enter text: QuickBrownFoxJumpsovertheDog

Vowels: 9

Consonants: 19

**Question No. 19: Palindrome tester**

Write a program to check whether given input is palindrome or not

In [19]:

string = input('Enter text: ')

**if** string[::-1] == string:

print(f'Text **{string}** is a Palindrome')

**else**:

print(f'Text **{string}** is not a Palindrome')

Enter text: HAHAH

Text HAHAH is a Palindrome

**Question No. 20: Count Alphabets, Numbers and Special Characters**

Write a Python program that accepts a string and calculate the number of digits and letters

In [20]:

text = input('Enter text: ')

num = 0

alpha = 0

special = 0

spaces = 0

**for** i **in** text:

**if** i >= '0' **and** i <= '9':

num += 1

**elif** (i >= 'a' **and** i <= 'z') **or** (i >= 'A' **and** i <= 'Z'):

alpha += 1

**elif** i == ' ':

spaces += 1

**else**:

special += 1

print(f'Numbers = **{num}**')

print(f'Alphabets = **{alpha}**')

print(f'Special Characters = **{special}**')

print(f'Spaces = **{spaces}**')

Enter text: Python 3.67

Numbers = 3

Alphabets = 6

Special Characters = 1

Spaces = 1

**Question No. 21: Write a Python program to construct the following pattern**

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

In [21]:

col = 5

**for** i **in** range(col):

**for** j **in** range(i+1):

print('\* ', end = '')

print('')

**for** i **in** range (col, 0, -1):

**for** j **in** range(0, i - 1):

print('\* ', end='')

print('')

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

**Question No. 22: Write a Python program to construct the following pattern**

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

1 2 3 4

1 2 3

1 2

1

In [22]:

rows = 5

**for** i **in** range (0, rows):

**for** j **in** range(0, i + 1):

print(f'{j+1} ', end='')

print("")

**for** i **in** range (rows, 0, -1):

**for** j **in** range(0, i -1):

print(f'{j+1} ', end='')

print("")

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

1 2 3 4

1 2 3

1 2

1

**Question No. 23: Write a Python program to construct the following pattern**

1

22

333

4444

55555

666666

7777777

88888888

999999999

In [23]:

**for** num **in** range(10):

**for** i **in** range(num):

print (f'**{num}** ', end = '')

print('')

1

2 2

3 3 3

4 4 4 4

5 5 5 5 5

6 6 6 6 6 6

7 7 7 7 7 7 7

8 8 8 8 8 8 8 8

9 9 9 9 9 9 9 9 9