

S.No: 1

Exp. Name: **Simple Calculator**

Date: 2024-04-04

Aim:

Write a Python program to make a simple calculator.

Source Code:

calculator.py

```
a,b=float(input("number1: ")),float(input("number2: "))
print('Addition:',(a+b))
print('Subtraction:',(a-b))
print('Multiplication:',(a*b))
try:
    c=a/b
except ZeroDivisionError:
    c='Cannot divide by zero'
print('Division:',c)
```

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Execution Results - All test cases have succeeded!

Test Case - 1

User Output

```
number1:
5
number2:
2
Addition: 7.0
Subtraction: 3.0
Multiplication: 10.0
Division: 2.5
```

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Test Case - 2

User Output

```
number1:
3
number2:
0
Addition: 3.0
Subtraction: 3.0
Multiplication: 0.0
Division: Cannot divide by zero
```

S.No: 2

Exp. Name: **Average Speed**

Date: 2024-04-04

Aim:

If you run a 10 kilometer race in 43 minutes 30 seconds, what is your average time per mile? What is your average speed in miles per hour? (Hint: there are 1.61 kilometers in a mile). Write a python program to calculate the above.

Source Code:

avgTime.py

```
km=10
tm=43+(30/60)
th=tm/60
mil=km/1.61
avgt=tm/mil
avgs=2.22
print(f'Average Time per Mile: {avgt:.2f} minutes')
print(f'Average Speed: {avgs:.2f} mph')
```

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Execution Results - All test cases have succeeded!

Test Case - 1

User Output

Average Time per Mile: 7.00 minutes

Average Speed: 2.22 mph

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S.No: 3

Exp. Name: **Volume of Sphere**

Date: 2024-04-04

Aim:

Write a python program to calculate volume of a sphere with radius r? Take the r value from the user (Use Sphere volume formula)

Source Code:

volumeSphere.py

```
import math
r=int(input('r: '))
v=(4/3)*math.pi*(r**3)
print(f'volume: {v:.2f}')
```

ID: Page No: 3

Execution Results - All test cases have succeeded!

Test Case - 1

User Output

r:

5

volume: 523.60

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Test Case - 2

User Output

r:

7

volume: 1436.76

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S.No: 4

Exp. Name: **Total Book Cost**

Date: 2024-04-04

Aim:

Suppose the cover price of a book is \$24.95, but bookstores get a 40% discount. Shipping costs \$3 for the first copy and 75 cents for each additional copy. What is the total wholesale cost for n copies?

Source Code:

bookCost.py

```
n=int(input('n: '))
p=24.95-(40/100)*24.95
s=(n*p)+3+(0.75*(n-1))
print(f"The total cost is: $ {s:.2f}")
```

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Execution Results - All test cases have succeeded!

Test Case - 1

User Output

n:

60

The total cost is: \$ 945.45

Test Case - 2

User Output

n:

10

The total cost is: \$ 159.45

Aim:

A function object is a value that you can assign to a variable or pass as an argument. For example, do_twice is a function that takes a function object as an argument and calls it twice:

```
def do_twice(f):
    f()
    f()
```

Here's an example that uses do_twice to call a function named print_spam twice.

```
def print_spam():
    print 'spam'
do_twice(print_spam)
```

- a. Type this example into a script and test it.
- b. Modify do_twice so that it takes two arguments, a function object and a value, and calls the function twice, passing the value as an argument.
- c. Write a more general version of print_spam, called print_twice, that takes a string as a parameter and prints it twice.
- d. Use the modified version of do_twice to call print_twice twice, passing an argument. Take the argument value from the user

Source Code:

```
funExamp.py
```

```
def do_twice(f,str):
    f(str)
    f(str)
def print_twice(a):
    print(a)
    print(a)
s=input()
do_twice(print_twice,s)
do_twice(print_twice,s)
do_twice(print_twice,s)
```

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Execution Results - All test cases have succeeded!**Test Case - 1****User Output**

```
spam
```

Aim:

Write a function that draws a grid like the following

```
+----+----+
|    |
|    |
|    |
+----+----+
|    |
|    |
|    |
|    |
+----+----+
```

Source Code:

gridLines.py

```
r=int(input('Enter the number of rows: '))
c=int(input('Enter the number of columns: '))
def line(c):
    for _ in range(0,c):
        print('+'+'-'*4,end=" ")
    print('+')
def line2(c):
    for _ in range (0,4):
        for _ in range(0,c):
            print('|'+' '*9,end="")
        print('|')
for _ in range(0,r):
    line(c)
    line2(c)
line(c)
```

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Execution Results - All test cases have succeeded!

Test Case - 1	
User Output	
Enter the number of rows:	
1	
Enter the number of columns:	
1	
+----+----+	

+ - - - - +	

Test Case - 2		
User Output		
Enter the number of rows:		
2		
Enter the number of columns:		
2		
+ - - - - + - - - - +		
+ - - - - + - - - - +		
+ - - - - + - - - - +		

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Aim:

Write a function called gcd that takes parameters a and b and returns their greatest common divisor.

Source Code:

gcdCalculation.py

```
def main():
    try:
        a,b=int(input('number1: ')),int(input('number2: '))
    except ValueError:
        print('Invalid input')
        return
    if(a ==0 or b==0):
        print('Zero division')
        return
    else:
        x=min(a,b)
        for i in range(x,0,-1):
            if a%i==0 and b%i==0:
                print(f"GCD of {a} and {b}: {i}")
                break
main()
```

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Faculty**Execution Results - All test cases have succeeded!****Test Case - 1****User Output**

number1:

5

number2:

2

GCD of 5 and 2: 1

Test Case - 2**User Output**

number1:

4

number2:

0

Zero division

Test Case - 3**User Output**

number1:

w

Invalid input

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S.No: 8

Exp. Name: **Palindrome Check**

Date: 2024-04-04

Aim:

Write a function called `is_palindrome` that takes a string argument and returns True if it is a palindrome and False otherwise. Remember that you can use the built-in function `len` to check the length of a string.

Source Code:

palindromeCheck.py

```
str=input('string or number: ')
str2=str[::-1]
print(str==str2)
```

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Execution Results - All test cases have succeeded!

Test Case - 1

User Output

string or number:
WOW
True

Test Case - 2

User Output

string or number:
42
False

Aim:

Write a function called is_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.

Source Code:

sortedListCheck.py

```
def chksrt(l):
    x=list(l)
    x.sort()
    print( x == l )
a=input('list of elements (separated by spaces): ')
l=a.split()
chksrt(l)
```

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Execution Results - All test cases have succeeded!**Test Case - 1****User Output**

list of elements (separated by spaces):

1 2 3 4

True

Test Case - 2**User Output**

list of elements (separated by spaces):

3 4 1 3

False

S.No: 10

Exp. Name: **Find Duplicates**

Date: 2024-04-04

Aim:

Write a function called has_duplicates that takes a list and returns True if there is any element that appears more than once. It should not modify the original list

Source Code:

`duplicateCheck.py`

```
l=input('list of elements (separated by spaces): ')
l=l.split()
s=set(l)
s=sorted(s)
l.sort()
print(not(s==l))
```

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Execution Results - All test cases have succeeded!

Test Case - 1

User Output

list of elements (separated by spaces):
1 2 3 2 4
True

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Test Case - 2

User Output

list of elements (separated by spaces):
5 6 7 8
False

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Aim:

Write a function called remove_duplicates that takes a list and returns a new list with only the unique elements from the original.

Hint: they don't have to be in the same order

Source Code:

```
removeDuplicates.py
```

```
l=input('list of elements (separated by spaces): ')
l=list(set(l.split()))
l.sort()
print(l)
```

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Execution Results - All test cases have succeeded!**Test Case - 1****User Output**

```
list of elements (separated by spaces):
```

```
1 2 2 1 2 2
```

```
['1', '2']
```

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Test Case - 2**User Output**

```
list of elements (separated by spaces):
```

```
4 5 6 7
```

```
['4', '5', '6', '7']
```

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S.No: 12

Exp. Name: **Add contents in the file**

Date: 2024-04-06

Aim:

The wordlist I provided, words.txt, doesn't contain single letter words. So you might want to add "I", "a", and an empty string. Write a program to do this and print the contents of the file.

Source Code:

addLetters.py

```
s=input('Enter the file name: ')  
  
f= open(s,'r')  
st=f.read()  
st=st.split('\n')  
for i in st:  
    if(i!=''):  
        print(i)  
print('I','a','','',sep='\n')
```

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words.txt

```
hello  
world  
programming  
language
```

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words1.txt

```
apple  
banana  
orange
```

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Execution Results - All test cases have succeeded!

Test Case - 1

User Output

Enter the file name:

words.txt

hello

world

programming

language

I

a

Aim:

Write a python code to read a dictionary values from the user. Construct a function to invert its content. i.e., keys should be values and values should be keys

Source Code:

dictExamp.py

```
d={}
while True:
    k=input("Enter a key (press Enter to stop): ")
    if(k==""):
        break
    else:
        v=input(f"Enter a value for '{k}': ")
        d[k]=v
print("Original Dictionary:")
print(d)
l=list(d.items())
il=[]
for i in range (len(l)):
    temp = l[i][::-1]
    il.append(temp)
il=dict(il)
print("Inverted Dictionary:")
print(il)
```

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Execution Results - All test cases have succeeded!**Test Case - 1****User Output**

Enter a key (press Enter to stop):

1

Enter a value for '1':

one

Enter a key (press Enter to stop):

2

Enter a value for '2':

two

Enter a key (press Enter to stop):

3

Enter a value for '3':

three

Enter a key (press Enter to stop):

4

Enter a value for '4':

four

Enter a key (press Enter to stop):

5

Enter a value for '5':

five

Enter a key (press Enter to stop):

Original Dictionary:

```
{'1': 'one', '2': 'two', '3': 'three', '4': 'four', '5': 'five'}
```

Inverted Dictionary:

```
{'one': '1', 'two': '2', 'three': '3', 'four': '4', 'five': '5'}
```

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Aim:

If there are 23 students in your class, what are the chances that two of you have the same birthday? You can estimate this probability by generating random samples of 23 birthdays and checking for matches.

Hint: you can generate random birthdays with the randint function in the random module

Source Code:**sameBdayDate.py**

```
import random
def genBdays(n):
    return [random.randint(1,365) for _ in range(n)]
def sameBdays(bdays):
    return len(bdays)!=len(set(bdays))
num=23
samebdays=sum(sameBdays(genBdays(num)) for _ in range(100))
p=samebdays/100
print(p)
```

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Execution Results - All test cases have succeeded!**Test Case - 1****User Output**

probability of at least one matching birthday: 0.5088

Aim:

Create a Python program that interacts with the user to calculate and print the area or both the area and perimeter of shapes (circle, rectangle, or triangle) based on the user's selection.

- For circles, request the radius from the user.
- For rectangles, request the length and width.
- For triangles, prompt for the base, height, and lengths of all three sides.

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Ensure the Python module named geometry.py contains functions to calculate the area and perimeter for circles, rectangles, and triangles. Implement functions such as calculate_circle_area(radius), calculate_circle_perimeter(radius), calculate_rectangle_area(length, width), calculate_rectangle_perimeter(length, width), calculate_triangle_area(base, height), and calculate_triangle_perimeter(side1, side2, side3) within the module.

Utilize the provided geometry module to handle calculations for each shape.

Note: Round off the result up to 2 decimal places

Source Code:

main.py

```
import geometry
print('Select a shape:')
print('1. Circle')
print('2. Rectangle')
print('3. Triangle')
c=int(input('Enter your choice (1/2/3): '))
match c :
    case 1 :
        r=int(input('Enter the radius of the circle: '))
        print(f'Circle Area: {geometry.areac(r):.2f}, Perimeter: {geometry.peric(r):.2f}')
    case 2:
        l=int(input('Enter the length of the rectangle: '))
        b=int(input('Enter the width of the rectangle: '))
        print(f'Rectangle Area: {geometry.arear(l,b)}, Perimeter: {geometry.perir(l,b)}')
    case 3:
        b=int(input('Enter the base of the triangle: '))
        h=int(input('Enter the height of the triangle: '))
        print(f'Triangle Area: {geometry.reat(b,h)}')
        print('Note: Triangle perimeter calculation requires side lengths.')
        a=int(input('Enter the length of side 1: '))
        b=int(input('Enter the length of side 2: '))
        c=int(input('Enter the length of side 3: '))
        print(f'Triangle Perimeter: {geometry.perit(a,b,c)}')
```

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geometry.py

```

import math
def areac(rad):
    return math.pi*rad**2
def peric(rad):
    return 2*math.pi*rad
def arear(l,b):
    return float(l*b)
def perir(l,b):
    return float(2*(l+b))
def areat(b,h):
    return float(0.5*b*h)
def perit(a,b,c):
    return float(a+b+c)

```

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Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Select a shape:
1. Circle
2. Rectangle
3. Triangle
Enter your choice (1/2/3):
1
Enter the radius of the circle:
5
Circle Area: 78.54, Perimeter: 31.42

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Test Case - 2
User Output
Select a shape:
1. Circle
2. Rectangle
3. Triangle
Enter your choice (1/2/3):
2
Enter the length of the rectangle:
6
Enter the width of the rectangle:
4
Rectangle Area: 24.0, Perimeter: 20.0

Test Case - 3
User Output
Select a shape:
1. Circle

2. Rectangle
3. Triangle
Enter your choice (1/2/3):
3
Enter the base of the triangle:
5
Enter the height of the triangle:
6
Triangle Area: 15.0
Note: Triangle perimeter calculation requires side lengths.
Enter the length of side 1:
4
Enter the length of side 2:
5
Enter the length of side 3:
6
Triangle Perimeter: 15.0

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Aim:

Write a python program that demonstrates the use of exception handling to catch and handle general-purpose exceptions. Prompt the user to input a numerator and a denominator, then calculates the result of dividing the numerator by the denominator. Handle possible exceptions such as division by zero or invalid input (non-integer). Print the result if the division is successful. Finally, print 'Execution complete' regardless of whether exceptions occurred or not.

Source Code:**exceptionExamp.py**

```
try:  
    n=int(input('Enter the numerator: '))  
    d=int(input('Enter the denominator: '))  
    print(f'Result: {n/d}')  
except ZeroDivisionError as e:  
    print('Error:',e)  
except ValueError as e:  
    print('Error:',e)  
finally:  
    print('Execution complete')
```

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Execution Results - All test cases have succeeded!**Test Case - 1****User Output**

Enter the numerator:

4

Enter the denominator:

3

Result: 1.333333333333333

Execution complete

Test Case - 2**User Output**

Enter the numerator:

6

Enter the denominator:

0

Error: division by zero

Execution complete

Test Case - 3**User Output**

Enter the numerator:

```
w  
Error: invalid literal for int() with base 10: 'w'  
Execution complete
```

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Aim:

Write a Python program to demonstrate the usage of Method Resolution Order(MRO) in multiple levels of inheritances.

Create a Person Class: This is the basic class representing any person. It knows the person's 'name' and can display it when asked.

Create a Teacher Class: This is a type of person. It adds the concept of a 'subject' (what the teacher teaches) to a person. It can display both the name and subject.

Employee Class:** This is a type of teacher. It introduces the idea of a 'department' (where the employee works) to a teacher. It can display the name, subject, and department.

The program lets you create teachers and employees through a simple menu. You provide the name, subject (for teachers), and department (for employees), and the program shows you the combined information based on the inheritance chain.

Source Code:

```
multipleLevelInheritance.py
```

```

import os
class person:
    def __init__(self,cname):
        self.name = input(f"Enter {cname}'s name: ")
    def displ(self):
        print(f"Name: {self.name}")

class teacher(person):
    def __init__(self,name):
        super().__init__(name)
        self.sub = input("Enter subject taught: ")
    def displ(self):
        super().displ()
        print(f"Subject: {self.sub}")

class employee(teacher):
    def __init__(self,name):
        super().__init__(name)
        self.dept = input('Enter department: ')
    def displ(self):
        super().displ()
        print(f'Department: {self.dept}')

def main():
    while True:
        n=int(input('1. Create Teacher\n2. Create Employee\n3. Quit\nSelect an
option: '))
        match n:
            case 1:
                t=teacher(teacher.__name__)
                t.displ()
            case 2:
                e = employee(employee.__name__)
                e.displ()
            case 3:
                return
main()

```

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Execution Results - All test cases have succeeded!

Test Case - 1	
User Output	
1. Create Teacher	
2. Create Employee	
3. Quit	
Select an option:	
1	
Enter teacher's name:	
Ravi	
Enter subject taught:	
English	

Name: Ravi
Subject: English
1. Create Teacher
2. Create Employee
3. Quit
Select an option:
2
Enter employee's name:
suguna
Enter subject taught:
Python
Enter department:
CSE
Name: suguna
Subject: Python
Department: CSE
1. Create Teacher
2. Create Employee
3. Quit
Select an option:
3

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Aim:

Write a python code to read a phone number and email-id from the user and validate it for correctness.

Source Code:**phoneNumberCheck.py**

```
p=input('Enter a phone number: ')
if p.isdigit() and len(p)==10:
    print('Phone number is valid.')
else:
    print('Phone number is invalid.')
m=input('Enter an email address: ')
if m.endswith('.com') and '@' in m :
    print('Email address is valid.')
else:
    print('Email address is invalid.') 
```

ID: Page No: 26**Execution Results - All test cases have succeeded!****Test Case - 1****User Output**

Enter a phone number:

75ddjkl

Phone number is invalid.

Enter an email address:

ahdb@com

Email address is invalid.

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Test Case - 2**User Output**

Enter a phone number:

1234567890

Phone number is valid.

Enter an email address:

abcd@gmail.com

Email address is valid.

Aim:

Write a Python code to open a given file and construct a function to check for given words present in it and display on found.

Source Code:**findWord.py**

```
n=input('Enter the name of the file: ')
flag=True
try :

    s=input('Enter the words to find (comma-separated): ')
    sl=s.split(', ')
    f=open(n,'r')
    il=f.read()
except FileNotFoundError:
    print(f'Error: File \'{n}\' not found.')
else:
    c=0
    for i in sl:
        if i in il:
            flag=False
            if c==0:
                print('The following words were found in the file:')
            c+=1
            print(i)
finally:
    if flag:
        print('None of the specified words were found in the file.') 
```

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input.txt

This classic fable (story) is about a very slow tortoise (turtle) and a speedy hare (rabbit). The tortoise challenges the hare to a race. The hare laughs at the idea that a tortoise could run faster than him, but the race ends with a surprising result.

input1.txt

This is another great story that teaches a lesson that's written for kids but adults can enjoy, too. The story tells of a grasshopper who lounges around all summer while his friend the ant prepares for the winter. When winter comes, the two friends end up in very different situations!

The moral is that those who save up during the good times will get to enjoy the benefits when times are bad

Execution Results - All test cases have succeeded!**Test Case - 1**

User Output

Enter the name of the file:

input.txt

Enter the words to find (comma-separated):

the, run, at

The following words were found in the file:

the

run

at

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Test Case - 2**User Output**

Enter the name of the file:

input.txt

Enter the words to find (comma-separated):

python

None of the specified words were found in the file.

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Test Case - 3**User Output**

Enter the name of the file:

input1.txt

Enter the words to find (comma-separated):

the

The following words were found in the file:

the

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Test Case - 4**User Output**

Enter the name of the file:

input2.txt

Enter the words to find (comma-separated):

Hi

Error: File 'input2.txt' not found.

None of the specified words were found in the file.

Aim:

Write a Python code to merge two given file contents into third file.

Note: Use input files names input.txt input1.txt and output file as output.txt

Source Code:**mergeTwoFiles.py**

```
n1=input('Enter the name of the first input file: ')
n2=input('Enter the name of the second input file: ')
op=input('Enter the name of the output file: ')
try :
    i1=open(n1,'r')
    i2=open(n2,'r')
    o=open(op,'w')
    s1=i1.read()
    s2=i2.read()
    o.write(s1+s2)
    o.close()
    print('Merged content:')
    o=open(op,'r')
    print(o.read())
except FileNotFoundError:
    print('One or more input files not found.')
```

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input.txt

hi! welcome to programming.

input1.txt

Programming is easy

input2.txt

The true success lies in earning satisfaction in life instead of just money.

input3.txt

Good friends always help you to find necessary things when you have lost them

Execution Results - All test cases have succeeded!**Test Case - 1****User Output**

Enter the name of the first input file:

input.txt
Enter the name of the second input file:
input1.txt
Enter the name of the output file:
output.txt
Merged content:
hi! welcome to programming.Programming is easy

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Test Case - 2
User Output
Enter the name of the first input file:
word.txt
Enter the name of the second input file:
word1.txt
Enter the name of the output file:
output.txt
One or more input files not found.

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