RAGHU ENGINEERING COLLEGE

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ACADEMIC YEAR - 2022-23

II B.Tech- I-Semester(AR20)

FACULTY LABORATORY MANUAL

For

PYTHON PROGRAMMING LAB
AR20- B.Tech.(Common to DS and AI & ML Specializations)
COURSE CODE: 20CS3205

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IDLE INSTALLATION PROCESS

SOFTWARE INSTALLATION PROCESS

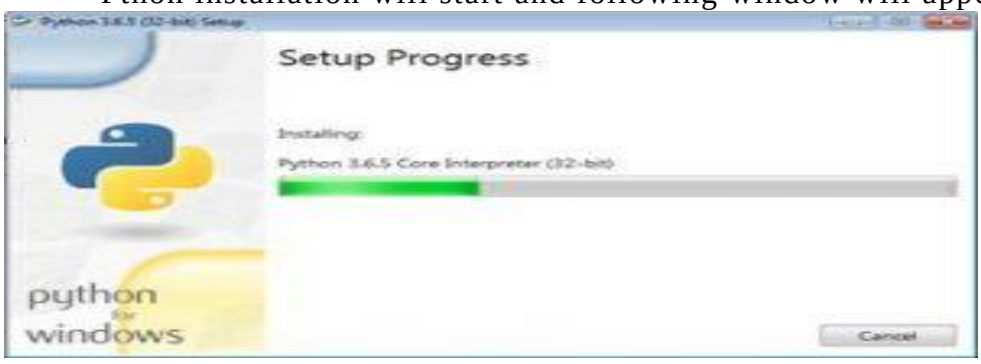
Installing on Windows

- Open website https://www.python.org/ from your web browser.

- Click at Downloads. Different options will be shown. You can choose the version you want to download as per your operating system.
- We can click at all releases if we want to download an older version of Python.
- Double click at Python installer donwloaded on your computer. Dialog box will appear as follow:

- Click at Run button to continue installation. Dialog Box will appear as

- Click at Install Now.
- Pthon installation will start and following window will appear



- When installation gets completed following window will appear

- Click close to close this window.

Exercise 1- Basics (Variables, Assignment)

1. **Correct the below code and execute it:**

```
val=789
print(“Given value is: “,VAL)
print(“Python is a case sensitive language”)
```

Objective:
To learn the concepts of Variables usage with print

Requirement Analysis:

- Spyder IDE installation
- Write the code
- Verify the error
- Execute the code

Program:

```
val=789
print("Given value is: ",val)
print("Python is a case sensitive language")
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

=============== RESTART: F:/skill course python/HACKER RANK/P1.py ==============
Given value is:  789
Python is a case sensitive language
```

2. Write a program to assign same value to multiple variables in a single line of statement.

Objective
To implement variable assignment
Requirement Analysis :

- Input two variables
- Assign the values while reading the input
- The datatype can be any type
- Print them using separate print statement

Program

```
x=y=int(input("Enter a value"))
print("x=",x)
print("y=",y)
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

=============== RESTART: F:/skill course python/HACKER RANK/P3.py ==============
Enter a value12
x= 12
y= 12
```

Exercise 2- Input Output

1. Write a program to read Regd. No, name from the student and display it on the screen.

Objective :
To learn input and output functionality in python
Requirement Analysis :

- Declare a variable for Regd No and read using input statement
- Declare a variable student name and read using input statement
- Print each value separately using print statement

Program

```
Regd_no=input("Enter Student Roll Number :")
Student_name=input("Enter Student Name : ")
print("Regd. No:" + Regd_no+ "")
print("Name:" + Student_name +"")
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

=============== RESTART: F:/skill course python/HACKER RANK/P4.py ==============
Enter Student Roll Number :18VV1D5809
Enter Student Name : Penta Siva Sai Geethika
Regd. No:18VV1D5809
Name:Penta Siva Sai Geethika
```

2. Write a program to display the below message: Hello, \nREI\n students

Objective :
To learn escape sequence
Requirement Analysis :
Use escape sequence \n appropriately using print statement

Program

```
print("Hello, \\nREI\\n students")
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

=============== RESTART: F:/skill course python/HACKER RANK/P6.py ==============
Hello, \nREI\n students
```

Exercise 3- Operators

1. Write a program that asks the user for a weight in kilograms and converts it to pounds. There are 2.2 pounds in a kilogram

Objective
To learn usage of arithmetic operators
To implement round built in function to solve the given problem using conversion

Requirement Analysis:

- Read a variable kg using input function

- Convert into pounds using the given formula
- Assign the value to pounds
- Print the output

Program

```
kg=float(input("Enter Weight in Kilograms "))
pounds = kg * 2.2
print(kg,"kilograms = ",round(pounds , 3), "pounds ")
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

=============== RESTART: F:/skill course python/HACKER RANK/P7.py ==============
Enter Weight in Kilograms 78
78.0 kilograms =  171.6 pounds
```

2. Write a program that asks the user to enter three numbers (use three separate input statements). Create variables called total and average that hold the sum and average of the three numbers and print out the values of total and average.

Objective

To implement input statements
To understand variable concept
To apply arithmetic operators

Requirement Analysis:

- Read first number using input function
- Read second number using input function
- Read third number using input function
- Compute sum for the above variables
- Compute average for the sum
- Print the sum and average

Program

```
first_number=int(input("Enter First Number : "))
second_number=int(input("Enter Second Number : "))
third_number=int(input("Enter Third Number : "))
sum_numbers=first_number+second_number+third_number
print("Sum of three numbers is : ",sum_numbers)
print("Average value is : ",round((sum_numbers/3),2))
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

=============== RESTART: F:/skill course python/HACKER RANK/P8.py ==============
Enter First Number : 23
Enter Second Number : 34
Enter Third Number : 54
Sum of three numbers is :  111
Average value is :  37.0
```

Exercise 4- Conditional Statements

1. Write a program that asks the user to enter a length in feet. The program should then give the user the option to convert from feet into inches, yards, miles, millimeters, centimeters, meters, or kilometers. Say if the user enters a 1, then the program converts to inches, if they enter a 2, then the program converts to yards, etc.

Use below conversion formulas:

1. inches=multiply the length value with 12
2. yards=divide the length value by 3
3. miles=divide the length value by 5280
4. millimeters=for an approximate result, multiply the length value by 305
5. centimeters=multiply the length value with 30.48
6. meters=for an approximate result, divide the length value by 3.281
7. kilometers=for an approximate result, divide the length value by 3281

Objective
To learn and implement operators in C++
Requirement Analysis :
Read the length using input
Use the given formulas to calculate the result
Display the result in appropriate format

Program

```
print("Converter ")
print("-----------------------")
print("List of options ")
print("-----------------------")
print("1. To Inches")
print("2. To Yards")
print("3. To miles")
print("4. To Millimeters")
print("5. To Centimeters")
print("6. To Meters")
print("7. To Kilometers")
print("-----------------------")
print()
option=int(input("Enter your option :"))
length=float(input("Enter length in feet : "))

if(option==1):
   result=length*12
   print("Given length in inches is %.4f"%(result))
elif(option==2):
   result=length/3
   print("Given length in yards is %.4f"%result)
elif(option==3):
   result=length/5280
   print("Given length in miles is %.4f"%result)
elif(option==4):
   result=length*305
   print("Given length in millimeters is %.4f"%result)
elif(option==5):
   result=length*30.48
   print("Given length in centimeters is %.4f"%result)
elif(option==6):
   result=length/3.281
   print("Given length in meters is %.4f"%result)
else:
   result=length/3281
print("Given length in kilometers is %.4f"%result)
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:\skill course python\HACKER RANK\P11.py ==============
Converter
----------------------
List of options
-----------------------
1. To Inches
2. To Yards
3. To miles
4. To Millimeters
5. To Centimeters
6. To Meters
7. To Kilometers
------------------------

Enter your option :2
Enter length in feet : 23
Given length in yards is 7.6667
Given length in kilometers is 7.6667
```

2. Write a program to check whether given character is alphabet or not, if yes check whether vowel or consonant.

Objective

To learn and implement operators

Requirement Analysis :

- Read the character
- Compare the input with appropriate values
- Display the result

Program

```
alpha=input("Enter a character : ")
if((alpha>='A' and alpha<='Z') or (alpha>='a' and alpha<='z')):
   if(alpha=='a' or alpha=='A' or alpha=='e' or alpha=='E' or alpha=='i' or alpha=='I' or alpha=='o' or alpha=='O' or alpha=='u' or alpha=='U'):
      print("vowel")
   else:
      print("consonant")
else:
   print("Not an alphabet")
```

Output

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P12.py ==============
Enter a character : a
vowel
```

Exercise 5- Looping Statements

1. Write a program to print the following pattern when n (no. of rows) is given as input, If n=4,

```
*
* *
* * *
* * * *
```

Objective :

- To learn usage of loops

- Apply the problem solving technique using loops concepts

Requirement Analysis:

- Take input no of rows the user need to print
- Assign the symbol “*” to a variable
- Print using for loop with range function

Program

```
rows=int(input("Enter number of rows "))
star="*"
for i in range(1,rows+1):
   print(star*i)
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P13.py ==============
Enter number of rows 4
*
**
***
****
```

2. Write a program to print next immediate prime number of the given number.

Objective:

To Learn looping concept and apply prime number logic to print next prime value

Requirement Analysis :

- Read a number
- Set count←0
- Check if the number is divisible by the values ranging from 1 to the number
- If divisible increase count value
- If count is 2 print the value along with the message

Program

```
number=int(input("Enter any number :"))
count=0
val=number+1
while(1):
   count=0
   for i in range(1,val+1):
      if(val%i==0):
         count=count+1
   if(count==2):
      print("The next immediate prime numbers is",val)
      break
   else:
      val=val+1
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P15.py ==============
Enter any number :23
The next immediate prime numbers is 29
```

Exercise 6- Lists

1. Write a program to compute cumulative product of a list of numbers

Objective :

To learn lists concepts , decision making , loops

Requirement Analysis:

- Read a string
- Declare empty list
- For every value in the string
- Compare if the string is not empty , then add it to the list
- To find the product set a variable j←1
- Iterating through the loop multiply every value of list with j and append it to the newlist

Program

```
string=input("Enter list of numbers with a separator space : ")
mlist=[]
for i in string:
    if i!=" ":
        mlist.append(int(i))
new_list=[]
j=1
for i in range(0,len(mlist)):
    j*=mlist[i]
    new_list.append(j)

print(new_list)
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P19.py ==============
Enter list of numbers with a separator space : 123456
[1, 2, 6, 24, 120, 720]
```

2. Write a program to find the sum of corner elements in the given matrix

Objective :

To learn matrix concepts

Requirement Analysis:

- Declare an empty matrix
- Read the size
- Read the input .
- Since the input is in the form a string (every row)
- Split it and convert every value to an int and add it to the list
- For corner elements sum iterate for rows and columns values
- Compare if the of row index and column index is 0 or n-1 if equal then add it to sum

Program

```
mat=[]
n=int(input("Enter size"))
for x in range(n):
    str1=input()
    list1=str1.split()
    nl=[int(x) for x in list1]
    mat.append(nl)
sum1=0
for x in range(len(nl)):
    for y in range(len(nl)):
        if((x==0 or x==n-1) and (y==0 or y==n-1)):
            sum1+=mat[x][y]
```

```
print("Sum of corner elements ",sum1)
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P20.py ==============
Enter size3
1 2 3
4 5 6
7 8 9
Sum of corner elements  20
```

Exercise 7- Dictionaries

1. Write a program to count the numbers of characters in the string and store them in a dictionary data structure.
   Sample Input hello python
   Sample Output
   : 1, e : 1, h : 2, l : 2, n : 1, o : 2, p : 1, t : 1, y : 1

Objective:
To learn dictionaries
Requirement Analysis :

- Read a string
- Create an empty dictionary
- Store the count of each string in the dictionary using key value pair
- Display items of dictionary using dictionary function

Program

```
str1=input("Enter a string to count characters :")
str1=sorted(str1)
d={}
for x in str1:
   d[x]=str1.count(x)
for u,v in d.items():
   print(u,':',v)
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P28.py ==============
Enter a string to count characters :GEETHIKA
A : 1
E : 2
G : 1
H : 1
I : 1
K : 1
T : 1
```

2.Write a program to use split and join methods in the string and trace a birthday with a Dictionary data structure. If birthday is not found, display a message ‘Not found’. **Sample Input**
25/08/1991 XYZ 12/02/1990 ABC 01/01/1989 PQR
25-08-1991
Sample Output
The DOB 25/08/1991 found whose name is XYZ

Objective:
To learn dictionaries
Requirement Analysis:

- Read a string
- Split it and assign to a variable as list values

- Create an empty dictionary
- Assign the values of first list value as key and second list value as value in the dictionary
- Replace the '-' character with '/'
- For every key value pair in the dictionary compare the user input
- If matching then display else show the message "DoB not found"

Program

```
str1=input("Enter DOB and strings :")
l1=str1.split(' ')
d=dict()
flag=0
for i in range(0,len(l1)-1,2):
    d[l1[i]]=l1[i+1]
s=input("Enter the DOB to find : ")
s=s.replace('-','/')
for x,y in d.items():
    if(x==s):
        print('The DOB',x,'found whose name is',y)
        flag=1
        break
if(flag==0):
    print("DOB is not found!!")
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P29.py ==============
Enter DOB and strings : 12/07/1996
Enter the DOB to find : GEETHIKA
DOB is not found!!
```

Exercise 8- Strings

1. Write a program to find the reverse of each word in the given list of strings and display them.

Objective:

To learn strings and lists

Requirement Analysis:

Read the input from user
Use split function and store in the list
Create an empty list
Compare if it contains alphabet values , if true append to a list by reversing it else append the actual value without reversing
Print the values in the newlist

Program

```
s=input("Enter the text :")
list1=s.split()
list2=[]
for x in range(0,len(list1)):
    if(list1[x].isalpha()==True):
        list2.append(list1[x][::-1])
    else:
        list2.append(list1[x])
for y in list2:
    print(y,end=' ')
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P31.py ==============
Enter the text :GEETHIKA
AKIHTEEG
```

2. Given a string, the task is to write a program to extract overlapping consecutive string slices from the original string according to size K. K and string is to be given by user.

Objective :

To learn string concepts and functions

Requirement Analysis:

- Read the text from user
- Read the size of text of overlap from user
- Create an empty list
- Compare the overlapping size with string size
- If overlapping size is more the string size show “Invalid k value “ message
- Else append the values from string from I value to i+overlapping size using for loop

Program

```
string=input("Input the string : ")
size=int(input("Enter the size to find overlapping :"))
newlist=[]
if(size>len(string)):
   print('Invalid k value')
else:
   for i in range(len(string)-size+1):
      newlist.append(string[i:i+size])
   print(newlist)
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P32.py ==============
Input the string : GEETHIKA
Enter the size to find overlapping :5
['GEETH', 'EETHI', 'ETHIK', 'THIKA']
```

Exercise 9- Functions

1. Write a function called ‘*first_diff*’ that is given two strings and returns the first location in which the strings differ. If the strings are identical, it should return -1.

Objective

To learn functions concept and use them

Requirement Analysis :

- Define a function as first_diff with two string inputs
- Write the appropriate logic for finding difference between two string :
- Read the input from user
- Call the function with user input

Program

```
def first_diff(string1,string2):
   x=string1.split()
   y=string2.split()
```

```
    if(len(x) < len(y)):
        length=len(x)
    else:
        length=len(y)
    for i in range(length):
        if x[int(i)] == y[int(i)]:
            print("The location of string same")
        else:
            b=x[i]
            print("The location of string different at : ",int(i),"-->",b)

string1="hello you are learning python now"
string2="hello you are good at learning"
first_diff(string1, string2)
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P35.py ==============
The location of string same
The location of string same
The location of string same
The location of string different at :  3 --> learning
The location of string different at :  4 --> python
The location of string different at :  5 --> now
```

2. Write a function '*ball_collide'* that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding.

   Hint: Represent a ball on a plane as a tuple of (x, y, r), r being the radius. If (distance between two balls centers) <= (sum of their radii) then (they are colliding)

Objective :

To learn and implement function concepts

Requirement Analysis:

- Import math function
- Define the function with three values are tuple . In the function write the formula using math.sqrt function
- Assign the values for two ball tuples
- Make the function call by giving the values are parameters

Program

```
import math
def ball_collide(ball_tuple1,ball_tuple2):
    d=math.sqrt((ball_tuple1[0]-ball_tuple2[0])**2 +

(ball_tuple1[1]-ball_tuple2[1])**2)
    if(d<=(ball_tuple1[2]+ball_tuple2[2])):
        return True
    else:
        return False

ball_tuple1=(-2,-2,3)
ball_tuple2=(1,1,3)

collision=ball_collide(ball_tuple1,ball_tuple2)
if(collision):
    print("Balls are collide.")
```

```
else:
   print("Balls are not collide.")
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P36.py ==============
Balls are collide.
```

Exercise 10- Class

1. Write a python program to illustrate class variable and instance variable for implementing Robot. In this program the user need to implement the robots and display the number of robots at each time.

Objective :

To learn classes and objects

Requirement Analysis :

- Create a class Robot
- Define a constructor with name as parameter .Initialize the value in the constructor
- Define a destructor and write the logic to decrease the robot population
- Define a method sayHi and show the appropriate message
- Define a method showmany and show the count of robots
- Invoke the functions

Program

```
class Robot:

   population = 0

   def __init__(self, name):

      self.name = name
      print('(Initializing {0})'.format(self.name))
      Robot.population += 1

   def __del__(self):

      print('{0} is being destroyed!'.format(self.name))

      Robot.population -= 1

      if Robot.population == 0:
         print('{0} was the last one.'.format(self.name))
      else:
         print('There are still {0:d} robots working.'.format(Robot.population))

   def sayHi(self):

      print('Greetings, my masters call me {0}.'.format(self.name))

   def howMany():

      print('We have {0:d} robots.'.format(Robot.population))
   howMany = staticmethod(howMany)

droid1 = Robot('R1-D1')
```

```
droid1.sayHi()
Robot.howMany()

droid2 = Robot('R2-D2')
droid2.sayHi()
Robot.howMany()

print("\nRobots can do some work here.\n")

print("Robots have finished their work. So let's destroy them.")
del droid1
del droid2

Robot.howMany()
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/p40.py ==============
(Initializing R1-D1)
Greetings, my masters call me R1-D1.
We have 1 robots.
(Initializing R2-D2)
Greetings, my masters call me R2-D2.
We have 2 robots.

Robots can do some work here.

Robots have finished their work. So let's destroy them.
R1-D1 is being destroyed!
There are still 1 robots working.
R2-D2 is being destroyed!
R2-D2 was the last one.
We have 0 robots.
```

2. Write a class called Time whose only field is a time in seconds. It should have a method called *convert_to_minutes* that returns a string of minutes and seconds formatted as in the following example: if seconds is 230, the method should return '5:50'.

Objective :
To learn classes and object concepts
Requirement Analysis:

- Create a class time
- Define a constructor to initialize the values
- Define a function convert and write the logic of computing minutes and seconds and hours
- Create an object and make the function call

Program

```
class Time:
    def __init__(self,seconds):
        self.seconds=seconds

    def convert(self):
        self.seconds = self.seconds % (12 * 3600)
        hour = self.seconds // 3600
```

```
    self.seconds %= 3600
    minutes = self.seconds // 60
    self.seconds %= 60
    return "%d:%02d:%02d" % (hour, minutes, self.seconds)

a=Time(230)
print(a.convert())
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/p41.py ==============
0:03:50
```

Exercise 11- Inheritance

1. Create a class Person which is having field '*name*', and its sub class Student consists of a method *nameLength()* which returns number of characters in the value assigned to name field.

Objective :

To learn classes and object

Requirement Analysis:

- Define a class person
- Define a constructor to initialize the name
- Define and write the function to find length

Program

```
class Person():
   def __init__(self,name):
      self.name=name
   def nameLength(self):
      print("Length of the name:%d characters"%(len(self.name)))

p1=Person(input("Enter a string : "))
p1.nameLength()
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P43.py ==============
Enter a string : GEETHIKA
Length of the name:8 characters
```

2. Create a class called 'Bank' which consists of a method *getroi()*, override *getroi()* method in it's sub classes SBI, ICICI classes to return different rate of interest values.

Objective :

To learn Inheritance

Requirement Analysis:

- Create a class Bank and define a method getroi and return the interest value
- Create a child class ICICI inheriting from Bank and redefine the getroi method to return interest value
- Create another child class SBI inheriting from Bank and redefine the getroi method to return interest value
- Create two child objects for SBI and ICICI and make the function call

Program

```
class Bank:
    def getroi(self):
        return 12
class ICICI(Bank):
    def getroi(self):
        return 9;

class SBI(Bank):
    def getroi(self):
        return 7;

ic=ICICI()
sb=SBI()
print("ICICI Rate of Interest :",ic.getroi())
print("SBI Rate of Interest : ",sb.getroi())
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P45.py ==============
ICICI Rate of Interest : 9
SBI Rate of Interest :  7
```

Exercise 12- Exception Handling

1. Write a program to perform addition of two numbers in a try block and wrote except block to handle ValueError if invalid data is given for input() function.

Objective :
To learn Exception handling
Requirement Analysis

- Read two inputs from user
- Place the sum statement under try block
- Use except for ValueError and print the appropriate message

Program

```
val1=input("Give an input : ")
val2=input("Give another input : ")
try:
    print("Result is : ",int(val1)+int(val2))
except ValueError as ve:
    print("Character conversion with int() is invalid!!")
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/p46.py ==============
Give an input : 25
Give another input : 56
Result is :  81
```

2. Write a program to display an element of a list given by asking an index value from the user and also write except block to handle IndexError.

Objective :
To learn exception handling
Requirement Analysis :

- Read the input and process the input to list
- Read the index from user
- Put the statement of displaying the value in the try block

- Handle with except IndexError
- Display a proper message

Program

```
string=input("Enter list of values : ")
nlist=string.split(" ")
print("Enter the index to show the value : ")
ind=int(input())
try:

    print(nlist[ind] , " is the element at position",ind)

except IndexError:
    print("There is no element Index doesn't exists !..")
```

Output:

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

============== RESTART: F:/skill course python/HACKER RANK/P48.py ==============
Enter list of values : 52,25,65,45,84
Enter the index to show the value :
2
There is no element Index doesn't exists !..
```