Program 1

Write a program to find the largest prime factor of a given integer

The Largest prime factor is a very simple concept. Let us break it down:

- Every number has many different factors.
- Factors are numbers that completely divide a particular number to get zero as a remainder.

Example1:- (Even Numbers)

- If we look at the number 6, it has four factors: 1, 2, 3, 6.
- However, of these factors, 1, 2 and 3 are prime numbers.
- As 3 is greater than 1, 2. 3 is said to be the largest prime factor of number 6.

Example1:- (Odd Numbers)

- If we look at the number 15, it has four factors: 1, 3, 5, 15.
- However, of these factors, 1, 3 and 5 are prime numbers.
- As 5 is greater than 1 &3, 5 is said to be the largest prime factor of number 15.

Example 3:- (Prime Numbers)

- If we look at the number 13, it has 2 factors: 1,13.
- However, of these factors, 1 and 13 are prime numbers.
- As 13 is greater than 1 so 13 is said to be the largest prime factor of number 13.

Program

```python
#Read the input
n=input("Enter the number\n")

#convert to int
n=int(n)
maxPrime=-1

#Run this loop for Even Numbers
#check the given number is even or not
while n%2==0:
    maxPrime=n
    #Reduce the number dividing by 2
    n=n/2

#Run this loop for odd numbers
#num**2 to find the squareroot of given number
#i starts from 3 and incremented by 2
#because we need to check only for odd numbers
for i in range(3, int(n**0.5)+1,2):
    #to check even number
    while n%i==0:
        maxPrime=i
        #Reduce the number dividing by i
        n=n/i
```

RV College of Engineering

Autonomous
Institution Affiliated
To Visvesvaraya
Technological
University, Belagavi

Approved by AICTE,
New Delhi, Accredited
By NAAC, Bengaluru
And NBA, New Delhi

Lab Manual for 1 Semester

Python Programming Lab [22PL1B01]
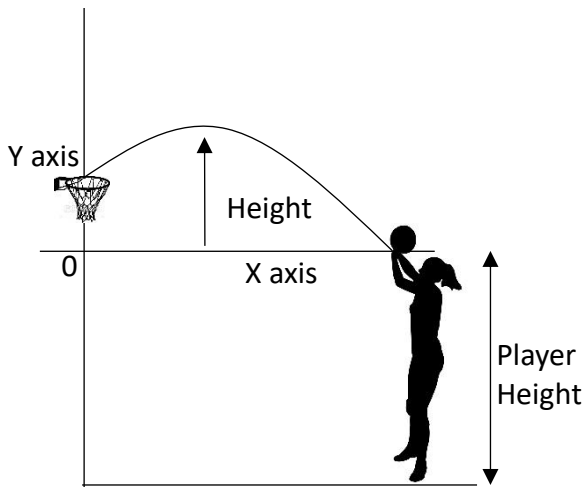
```
#if n is greater assign maxPrime = n
if n>2:
    maxPrime=n

#To print max prime factor
print("Max Prime factor :   ",int(maxPrime))
```

Output

```
Enter the number
10
Max Prime factor :    5
```

RV College of Engineering

Autonomous
Institution Affiliated
To Visvesvaraya
Technological
University,
Belagavi

Approved by AICTE,
New Delhi,
Accredited
By NAAC, Bengaluru
And NBA, New Delhi

Lab Manual for 1 Semester

Python Programming Lab [22PL1B01]

Program 1

Write a program to find the height of the ball thrown by a basketball player

Formula: `h(t)=-16t² +vt`
Where   `h(t) is the height at t seconds`
             `t time in seconds`
             `v is the velocity in which the ball is thrown`

`Time taken by the ball to reach maximum height is`
Formula   `t=` $\dfrac{-b}{2a}$
             `t time in seconds`
             `a is the value 16`
             `b is the velocity`

If 5 feet basketball player thrown the ball velocity at 32 feet/second then calculation is as follows

`h(t)=-16t² +vt`
`h(t)=-16t² +32t`

`find t      t=` $\dfrac{-b}{2a}$
            `t=` $\dfrac{-(32)}{2X(-16)}$ `=` $\dfrac{-32}{-32}$ `= 1`
            `now t = 1`

Substitute the value of t in formula
            `h(t)  =-16t² + 32t`
            `h(1)  =-16(1)² + 32(1)`
            `h(1)  =-16+32`
            `h(1)  =16 feet`
so the height of player is 5 feet `h(1)     =16 + 5 = 21 Feets`

Program

```python
#declare a value
a=-16
#read velocity from user
b=int(input("Enter the velocity  :  "))

#read player height
pHeight=float(input("Enter player height : "))

#calculate time use formula
t=float(-b/(2*a))
print("Time : ",t," seconds")

#to calculate the height use formula
h=(a*(t**2))+(b*t)

#print the result
print("Height is :  ",h," feet")

#add the player height with ball height
h=h+ pHeight
print("Total Height is :  ",h," feet")
```

output

```
Enter the velocity  :  32
Enter player height :  5
Time :  1.0  seconds
Height is :   16.0  feet
Total Height is :   21.0  feet
```

RV College of Engineering

Autonomous
Institution Affiliated
To Visvesvaraya
Technological
University,
Belagavi

Approved by AICTE,
New Delhi,
Accredited
By NAAC, Bengaluru
And NBA, New Delhi

Lab Manual for 1 Semester

Python Programming Lab [22PL1B01]

Program 3

Write a program to find the Golden ratio

The golden ratio, which is also referred to as the golden mean, divine proportion, or golden section, exists between two quantities if their ratio is equal to the ratio of their sum to the larger quantity between the two. With reference to this definition, if we divide a line into two parts, the parts will be in the golden ratio if:
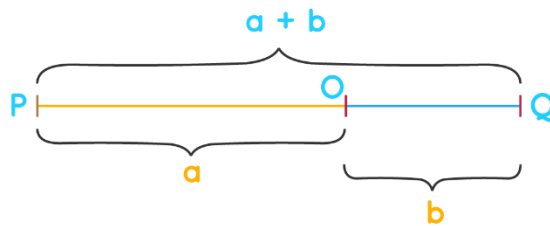
$$\frac{a}{b} = \frac{a + b}{a} = 1.618.... = \phi$$
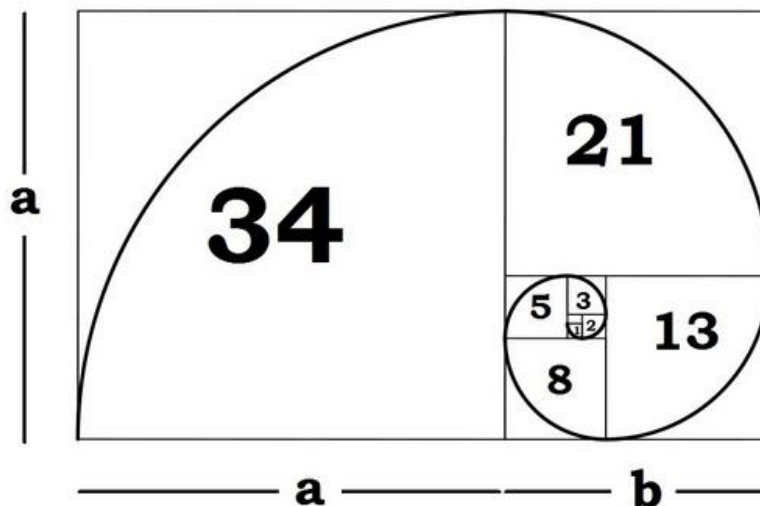
$$x = \frac{1 + \sqrt{(5)}}{2} = 1.618034...$$

Program:

```python
#read number of series you need
n=int(input("Enter number of series : "))


# Golden series
# Iterative method, with values saved in a list
fiblist = [0,1]
for i in range(0, n):
    fiblist.append(fiblist[i] + fiblist[i+1])
print("Series are",fiblist)


#computing the ratio of successive terms in the list of Fibonacci
numbers
gratio=[fiblist[i] / float(fiblist[i-1]) for i in range(2,len(fiblist))]
print("Golden ratio : ",gratio)
```

Output:

```
Enter number of series : 5
Series are [0, 1, 1, 2, 3, 5, 8]
Golden ratio :  [1.0, 2.0, 1.5, 1.6666666666666667, 1.6]
```

RV College of Engineering

Autonomous
Institution Affiliated
To Visvesvaraya
Technological
University, Belagavi

Approved by AICTE,
New Delhi, Accredited
By NAAC, Bengaluru
And NBA, New Delhi

Lab Manual for 1 Semester

Python Programming Lab [22PL1B01]

Program 4

Read a paragraph from the user and count the number of words, and frequency of Words appearing, and search for the specific word.

Program

```python
#read the string / paragraph
str =input("Enter the paragraph\n")

#print the string / paragraph
print("Entered Paragraph\n"+str)

#The split() method splits a string into a list.
#The len() funcion finds the list count
wordCount=len(str.split())
print("Total Number of words :  ", wordCount)#print the word count

counts = dict()# Create an empty dictionary
words = str.split()# The split() method splits a string into a list.

#Run a loop to iteratively to check the words
for word in words:
    if word in counts:#Check whether the word present in the dictionary or not
        #if word is present increase the word count
        counts[word] =counts[word]+ 1
    else:
        #If word is not present add new word to dictionary
        counts[word] = 1

#Run loop to display the words count
for key in list(counts.keys()):
    print(key, ":", counts[key])#print thr dictionary content and occrance
using counts[]

#input string / word to search
searchWord=input("Enter the word to search :   ")
result = str.find(searchWord)#find() function finds the word in the string and
return the value

if(result!=-1):#if Found disply success message
    print(searchWord +"  Word found in string")
else:#if not Found disply unsuccessfull message
    print(searchWord + " !!!!! Word not found in string")
```

Output

```
Enter the paragraph
banana orange orange banana apple
Entered Paragraph
banana orange orange banana apple
Total Number of words :    5
banana : 2
orange : 2
apple : 1
Enter the word to search :   apple
apple   Word found in string
```

```python
''' Create an Employee Database using dictionaries and perform the

insert, search, display, and Delete operations. '''


# Creating the Dictionary

Employee = dict()




while True:


    print("===== Employee Database =====\n")

    print(" 1. Create Employee\n 2. Add New Employee\n 3. Search Employee\n 4. Delete Employee\n
5. Display\n")

    print("============================")


    Choice = int(input("Enter the Choice: "))


    if Choice == 1:
        n = int(input("Enter the Number of Employees: "))
        for i in range(n):
            print("-------------------------------------")
            print("Enter the Employee {0} Details".format(i+1))
            print("-------------------------------------")
            EmpId = int(input("Enter the EmployeeId: "))


            EmpDetails = []

            EmpName = input("Enter the Employee Name: ")

            EmpDOB = input("Enter the DOB: ")

            Designation = input("Enter the Disignation: ")


            EmpDetails.append(EmpName)
```

```python
        EmpDetails.append(EmpDOB)

        EmpDetails.append(Designation)

        Employee[EmpId] = EmpDetails

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


elif Choice == 2:

    EmpId = int(input("Enter the EmployeeId: "))


    EmpDetails = []

    EmpName = input("Enter the Employee Name: ")

    EmpDOB = input("Enter the DOB: ")

    Designation = input("Enter the Disignation: ")


    EmpDetails.append(EmpName)

    EmpDetails.append(EmpDOB)

    EmpDetails.append(Designation)

    Employee[EmpId] = EmpDetails

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


elif Choice == 3:

    EId = int(input("Enter the EmployeeId to Display: "))

    print(Employee.get(EId))

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




elif Choice == 4:

    EId = int(input("Enter the EmployeeId to Delete: "))

    print(Employee.pop(EId))

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


elif Choice == 5:
```

```python
            Status = bool(Employee)

        if  Status == False:

            print("\n No Employee Details Found to Print \n")

        else:

            print(Employee)


else:

    print("Invalid Choice")

    break
```

```python
''' Implement Set and Tuple Operations '''
# create empty set and tuple
setdata=set()
tupledata=tuple()

#run infinite loop for menu
while 1:
    choice=input("Enter your choice \nS : Set Operation\nT : Tuple Operations\nN : Terminate\n")
    if choice=="s":
        while 1:
            print("Choose the Set operation")
            print("1 : Add/Insert")
            print("2 : Remove/Delete")
            print("3 : Update/Append")
            print("4 : Display/View")
            print("0 : Exit")
            operations=int(input())
            if operations == 1:
                data=input("Enter the elements to add : ")#read the data from the user
                setdata.add(data)#adds data to set
                print(setdata)
            elif operations == 2:
                data=input("Enter the elements to delete : ")#read the data from the user
                setdata.discard(data)#delets perticular data from the set
                print(setdata)
            elif operations == 3:
                data=input("Enter the elements to update : ")#read the data from the user
                setdata.update(data)#Update data
                print(setdata)
            elif operations == 4:
                print(setdata)#print set
```

```python
        elif operations == 0:
            break
        else:
            print("Invalid Choice")
elif choice == "t":
    while 1:
        print("Choose the Tuple operation")
        print("1 : Add/Insert")
        print("2 : Delete Tuple")
        print("3 : display/View")
        print("0 : Exit\n")
        operations=int(input())
        if operations == 1:
            data=input("Enter the elements to add : ")#read the data from the user
            tupledata+=(data,)#New data is appended to the tuple

        elif operations == 2:
            del tupdata #delets entire tuple
            print("Tuple Deleted")

        elif operations == 3:
            print(tupledata)#prints the tuple data

        elif operations == 0:
            break
        else:
            print("Invalid Choice")
elif choice == "n":
    break
```