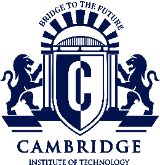
**CAMBRIDGE INSTITUTE OF TECHNOLOGY**

**K.R. PURAM, BENGALURU-560036**

**Application Development Using Python (18CS55)**

**Write Python program that accepts principle, rate of interest, time and compute the simple interest.**

P = 1000

R = 1

T = 2

# simple interest

SI = (P \* R \* T) / 100

print("simple interest is", SI)

**OUTPUT:**

simple interest is 20.0

**Write Python program to display palindrome numbers in a given range.**

print('palindrome numbers:')

for num in range(100):

temp=num

reverse=0

while(temp > 0):

Reminder = temp % 10

reverse = (reverse \* 10) + Reminder

temp = temp //10

if(num == reverse):

print(num)

**OUTPUT:**

Palindrome numbers:0 1 2 3 4 5 6 7 8 9 11 22 33 44 55 66 77 88 99

**Write python program to check if number is odd or even**.

num = int(input('Enter the number: '))

if (num % 2) == 0:

print(str(num),'is Even')

else:

print(str(num),'is odd')

**OUTPUT:**

Enter the number: 4

4 is Even

Enter the number: 9

9 is odd

**Write a Python program to convert Decimal number to Binary number.**

dec = 344

print("The decimal value of", dec, "is:")

print(bin(dec), "in binary.")

**OUTPUT:**

The decimal value of 344 is:

0b101011000 in binary.

**Write a Python program to accept a string and display vowels and consonants characters of the string.**

message="it is rainy day"

vowels = 0

consonants = 0

for i in message:

if(i == 'a' or i == 'e' or i == 'i' or i == 'o' or i == 'u' or i == 'A' or i == 'E' or i == 'I' or i == 'O' or i == 'U'):

vowels = vowels + 1

else:

consonants = consonants + 1

print("Total Number of Vowels in this String = ", vowels)

print("Total Number of Consonants in this String = ", consonants)

**OUTPUT:**

Total Number of Vowels in this String = 5

Total Number of Consonants in this String = 10

**Write Python program that accepts a distance in centimeters and prints the corresponding value in feet and inches**

centimeter=int(input("Enter the height in centimeters:"))

inches = 0.394 \* centimeter

feet = 0.0328 \* centimeter

print("The length in feet",round(feet,2))

print("The length in inches",round(inches,2))

**OUTPUT:**

Enter the height in centimeters: 500

The length in feet 16.4

The length in inches 197.0

**Write a Python program that accepts a sentence and find the number of words, digits, uppercase letters and lowercase letters.**

string=input("Enter string:")

lower=0

upper=0

digit=0

for i in string:

if(i.islower()):

lower += 1

elif(i.isupper()):

upper += 1

elif (i.isdigit()):

digit += 1

print("The number of lowercase characters is:",lower)

print("The number of uppercase characters is:",upper)

print("The number of special digits and characters is:",digit)

**OUTPUT:**

Enter string:It is raining from 5am

The number of lowercase characters is: 16

The number of uppercase characters is: 1

The number of special digits and characters is: 1

**Develop a Python program that accepts a sentence from the user and display the longest word of that sentence with its length.**

s=input("Enter sentence : ")

words=s.split()

length=len(words[0])

for w in words:

if length < len(w):

longest=w

length=len(w)

print("The longest word is", longest, " and its length is ",length)

**OUTPUT:**

Enter sentence: it is rainy outside.

The longest word is outside. and its length is 8

**Create a function to print out a blank tic-tac-toe board.**

theboard={'top-L':' ','top-M':' ','top-R':' ','mid-L':' ','mid-M':' ','mid-R':' ','low-L':' ','low-M':' ','low-R':' '}

def printBoard(Board):

print(Board['top-L']+'|'+ Board['top-M']+'|'+Board['top-R'])

print('-+-+-')

print(Board['mid-L']+'|'+ Board['mid-M']+'|'+Board['mid-R'])

print('-+-+-')

print(Board['low-L']+'|'+ Board['low-M']+'|'+Board['low-R'])

turn='X'

for i in range(9):

printBoard(theboard)

print('turn for '+turn+'.move on each space?')

move=input()

theboard[move]=turn

if turn=='X':

turn='0'

else:

turn='X'

printBoard(theboard)

**OUTPUT:**

| |

-+-+-

| |

-+-+-

| |

turn for X.move on each space?

mid-M

| |

-+-+-

|X|

-+-+-

| |

turn for 0.move on each space?

low-L

| |

-+-+-

|X|

-+-+-

0| |

**Write a Python program to demonstrate the working of stack (push, pop) operations by creating corresponding function for push and pop operations. Display the appropriate message in case of overflow and underflow situations.**

stack = []

stack.append('a')

stack.append('b')

stack.append('c')

print('Initial stack')

print(stack)

print('\nElements popped from stack:')

print(stack.pop())

print(stack.pop())

print(stack.pop())

print('\nStack after elements are popped:')

print(stack)

**OUTPUT:**

Initial stack

['a', 'b', 'c']

Elements popped from stack:

c

b

a

Stack after elements are popped:

[]

**Using Python, build phone book which contains name of the person with their phone numbers. Then, accept a name of the person and display the corresponding phone number of the person if found, else error message.**

phone\_book={‘Nithin':'9843291962','Akshay':'9986789888','Ankit':'8744578982','Hruthik':'7019916787','Chethan': '7658904387'}

name = input("Enter Name: ")

try:

print(f"Name: {name}\nPhone No: {phone\_book[name]}")

except KeyError:

print("Name Not Found")

**OUTPUT:**

Enter Name: Nithin

Name: Nithin

Phone No: 9843291962

Enter Name: ANU

Name Not Found

**Write a Python program to check whether a given number is prime or not.**

num = 11

if num > 1:

for i in range(2, int(num/2)+1):

if (num % i) == 0:

print(num, "is not a prime number")

break

else:

print(num, "is a prime number")

else:

print(num, "is not a prime number")

**OUTPUT:**

11 is a prime number

4 is not a prime number

**Write a Python program to find largest of three numbers using nested-if.**

num1 = float(input("Enter first number: "))

num2 = float(input("Enter second number: "))

num3 = float(input("Enter third number: "))

if (num1 >= num2) and (num1 >= num3):

largest = num1

elif (num2 >= num1) and (num2 >= num3):

largest = num2

else:

largest = num3

print("The largest number is", largest)

**OUTPUT:**

Enter first number: 13

Enter second number: 6

Enter third number: 45

The largest number is 45.0

**Write Python program to find sum of first n natural numbers.**

n = int(input("Enter the number: "))

print(f"Sum of the first {n} natural numbers is {(n\*(n+1))//2}")

**OUTPUT:**

Enter the number: 4

Sum of the first 4 natural numbers is 10

**Write a Python program to find factorial of a given number.**

num = 7

factorial = 1

for i in range(1,num + 1):

factorial = factorial\*i

print("The factorial of",num,"is",factorial)

**OUTPUT:**

The factorial of 7 is 5040

**Write Python program to check if given number is Armstrong or not (Ex: 153 = 1^3 + 5^3 + 3^3, therefore 153 is Armstrong number).**

num = input("Enter a number: ")

sum = 0

for i in num:

n=int(i)

sum += n\*\*3

if sum == int(num):

print(num,"is an Armstrong number")

else:

print(num,"is not an Armstrong number")

**OUTPUT:**

Enter a number: 153

153 is an Armstrong number

Enter a number: 148

148 is not an Armstrong number

**Define a Python function with suitable parameters to generate first N Fibonacci numbers.**

def fact(num):

OUTPUT:

How many terms? 10

Fibonacci sequence:0 1 1 2 3 5 8 13 21 34

n1, n2 = 0, 1

count = 0

if num==0 or num<0:

print("Please enter a positive integer")

else:

print("Fibonacci sequence:")

while count < num:

print(n1)

n = n1 + n2

n1 = n2

n2 = n

count += 1

num = int(input("How many terms? "))

fact(num)

**Write a Python program to count the number of occurrences of characters in a string using dictionary.**

import pprint

message = 'It was a bright cold day in April, and the clocks were striking thirteen.'

count = {}

for character in message:

count.setdefault(character, 0)

count[character] = count[character] + 1

pprint.pprint(count)

**OUTPUT:**

{' ': 13,

',': 1,

'.': 1,

'A': 1,

'I': 1,

'a': 4,

'b': 1,

'c': 3,

'd': 3,

'e': 5,

'g': 2,

'h': 3,

'i': 6,

'k': 2,

'l': 3,

'n': 4,

'o': 2,

'p': 1,

'r': 5,

's': 3,

't': 6,

'w': 2,

'y': 1}

**Write a Python program which accepts an IPv4 address and checks for the validity of byte values used (Ex: 192.186.1.2 is valid, 290.168.320.2 is invalid).**

from ipaddress import ip\_address, IPv4Address

def validIPAddress(IP: str) -> str:

try:

return "IPv4" if type(ip\_address(IP)) is IPv4Address else "IPv6"

except ValueError:

return "Invalid"

if \_\_name\_\_ == '\_\_main\_\_' :

Ip = "192.168.0.1"

print(validIPAddress(Ip))

Ip = "2001:0db8:85a3:0000:0000:8a2e:0370:7334"

print(validIPAddress(Ip))

Ip = "256.32.555.5"

print(validIPAddress(Ip))

Ip = "250.32:555.5"

print(validIPAddress(Ip))

**OUTPUT:**

IPv4

IPv6

Invalid

Invalid

**Write a Python program to accept n names and display the sorted name alphabetical order.**

names=[]

print("enter the name")

while True:

name=input()

if name=='':

break

names.append(name)

names.sort()

print("the sorted names are:")

for item in names:

print(item)

**OUTPUT:**

**enter the name**

grapes

mango

banana

**the sorted names are:**

banana

grapes

mango

**You are creating a fantasy video game. The data structure to model the player’s inventory will be a dictionary where the keys are string values describing the item in the inventory and the value is an integer value detailing how many of that item the player has. For example, the dictionary value {'rope': 1, 'torch': 6, 'gold coin': 42, 'dagger': 1, 'arrow': 12} means the player has 1 rope, 6 torches, 42 gold coins, and so on. Write a function named displayInventory() that would take any possible “inventory” and display it like the following inventory: 12 arrow, 42 gold coin, 1 rope, 6 torch, 1 dagger Total number of items: 63.**

stuff = {'rope': 1, 'torch': 6, 'gold coin': 42, 'dagger': 1, 'arrow': 12}

def displayInventory(inventory):

print("Inventory:")

item\_total = 0

for k, v in inventory.items():

print(str(v) + ' ' + k)

item\_total += v

print("Total number of items: " + str(item\_total))

displayInventory(stuff)

**OUTPUT:**

Inventory:

1 rope

Total number of items: 1

6 torch

Total number of items: 7

42 gold coin

Total number of items: 49

1 dagger

Total number of items: 50

12 arrow

Total number of items: 62

**Write a Python program to record marks of n students and display marks which are greater than the class average.**

print("enter the marks:(else -1)")

marks=[]

sum=0

while True:

mark=int(input(f"Student {len(marks)}: "))

if mark==-1:

break

sum += mark

marks.append(mark)

avg=sum/len(marks)

print("The marks greater than class average")

for i in marks:

if i>avg:

print(i)

**OUTPUT:**

enter the marks:(else -1)

Student 0: 56

Student 1: 98

Student 2: 77

Student 3: 65

Student 4: 80

Student 5: 79

Student 6: -1

The marks greater than class average

98

77

80

79

**Write a Python program which accepts n states name and number of Covid-19 positive cases and display the top 5 states with highest number cases and top 5 states with lowest cases.**

covid={}

for i in range(10):

l=input("enter the state name and cases").split()

covid[l[0]]=int(l[1])

print(covid)

l=list(covid.values())

l.sort()

for i in range(2):

for j,k in covid.items():

if(l[i]==k):

print(j,k)

l.sort(reverse=True)

for i in range(2):

for j,k in covid.items():

if(l[i]==k):

print(j,k)

**Output:**

enter the state name and cases a 21

enter the state name and cases b 55

enter the state name and cases c 90

enter the state name and cases d 3

enter the state name and cases e 66

enter the state name and cases f 888

enter the state name and cases g 72

enter the state name and cases h 12

enter the state name and cases i 09

enter the state name and cases j 88

{'a': 21, 'b': 55, 'c': 90, 'd': 3, 'e': 66, 'f': 888, 'g': 72, 'h': 12, 'i': 9, 'j': 88}

d 3

i 9

f 888

c 90