**AMITY INTERNATIONAL SCHOOL**

**PRACTICAL LIST 2018-19**

**CLASS XI, COMPUTER SCIENCE (PYTHON)**

1. WAP to calculate the area and circumference of a circle if radius is given.
2. WAP to find the simple interest if principal, rate and time are given
3. Write a program to find the sum of first three multiples of a given number n
4. Write a program to read your name, age and class and display message as -

**Welcome <name>**

**I am <age> years old and studying in class <class>**

**Last year I was <n> years old.**

1. WAP to find the denomination of currency in Re 1,2,5,10,50,100,500 and 1000 in a given amount entered by user.
2. WAP to make a simple calculator that reads two numbers and an operator. On selection of an operator, perform operation and print the result as shown below-

**Enter first number: 5**

**Enter second number: 7**

**Enter operator: \***

**Result: 5 \* 7 = 35**

1. A farm has chickens and rabbits. Farm owner counts number of heads and legs and wishes to find out number of chickens and rabbits? Write a program to solve this classic ancient Chinese puzzle. If farm owner counts 35 heads and 94 legs. Calculate and print how many rabbits and chickens he has?
2. You are driving a little too fast and the police officer stops you and issues a ticket. Write code to compute the result, encoded as an integer value: 0=no ticket, 1=small ticket, 2=big ticket.

If speed is 60 or less, the result is 0. If speed is between 61 and 80 inclusive, the result is 1. If speed is 81 or more, the result is 2. Unless it is your birthday, on that day, your speed can be 5 higher in all cases.WAP to model above scenario.

1. An electricity board charges according to the following rules:
   1. For the first 100 units – 40 p per unit (p = Paise)
   2. For the next 200 units - 50 p per unit
   3. Beyond 300 units - 60 p per unit
   4. All users have to pay meter charge also, which is Rs 50.
   5. Write a program to read the number of units consumed and print out the charges.

***Sample output***

***Input units: 150***

***Charges Rs. 115 [calculated as (100\*.4 + 50\*.50 +50)]***

1. WAP that reads n digit number. After reading the number, compute and display the sum of the odd positioned digits, multiply all even positioned digits and add these two numbers.
2. Write a program which will find all such numbers which are divisible by 7 but are not multiple of 5, between 2000 and 3200 (both included).

The numbers obtained should be printed in a comma-separated sequence on a single line.

1. Develop a program to classify students amongst various categories as per their age entered. Read age of N students and count no of students falling in each category as described below print a report as follows –

**Group A: 12 yrs and above but less than 15 yrs - XX**

**Group B: 15 yrs and above but less than 17 yrs - XX**

**Group C: 17 yrs and above but less than 19 yrs - XX**

**Group D: Lesser than 12 yrs - XX**

1. Every book published by an international publisher should carry an International standard book Number(ISBN).It is 10 character 4 part number as shown below:-

**0-07-041183-2**

The first part denotes the region, the second represents the publisher, the third identifies the book and fourth is the digit. The check digit is computed as follows:-

Sum=(1\*first digit)+(2\*second digit)+(3\*third digit)+……(9\*ninth digit)

Check digit is the remainder when sum is divided by 11. Write a program that reads a given ISBN number and checks whether it represents a valid ISBN.

1. Write a program to find if a number entered is a palindrome or not.
2. A very famous numerical algorithm exists to find out the highest common factor (also called the greatest common divisor) of two numbers. The algorithm was invented by Euclid; it is therefore called the Euclid’s algorithm.

Here is how the algorithm works. Say you wish to find out the HCF of two numbers A and B. Simply repeat the following steps until both numbers become equal:

If A is greater than B, change A to A-B and do not modify B

If B is greater than A, change B to B-A and do not modify A

The value of A (and B) when both become equal will be the Highest Common Factor!

**Let’s try this out with two numbers, A=18 and B=42.**

**B is greater than A, so B becomes 24 and A remains as 18. So, we have:**

**A = 18, B = 24**

**If we repeat this process, we get:**

**A = 18, B = 6 A = 12, B = 6 A = 6, B = 6**

**Finally, both A and B become equal (both have value 6). The HCF of 18 and 42 is 6.**

1. According to a study, the approximate level of Intelligence of a person can be calculated using the following formula:

i=2(y+0.5x)

Write program, which will produce a table of values of i,y and x where y varies from 1 to 6 and for each value of y , x varies from 5.5 to 12.5 in steps of 0.5.

1. Write a program to play the "Guess the number"-game, where the number to be guessed is randomly chosen between 1 and 20. This is how program should work when executed

**(Only three chances allowed)**

**Hello! What is your name?**

**Tanuj**

**Well, Tanuj, I have chosen of a number between 1 and 20.**

**Take a guess.**

**10**

**Your guess is too low.**

**Take a guess.**

**15**

**Your guess is too low.**

**Take a guess.**

**18**

**Good job, Tanuj! You guessed my number in 3 guesses!**

1. WAP to print the sum of n terms of the following series -

**A) x+ x2/2 + x3/3 + x4/4 +....+ xn/n**

**B) 1/ (sqrt(2) + 2 / sqrt(3) + 3/ sqrt(4) +.......n/sqrt(n+1)**

1. Read today's date as DD,MM,YYYY format and print it as DD- MMM - YY

**Eg Input date-**

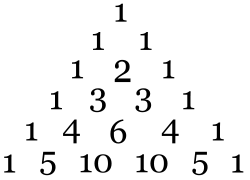
**Enter day 25**

**Enter month 04**

**Enter year 2014**

**Result: 25-APR -14**

1. WAP to print a Pascaline triangle of n lines.



1. Read two strings and check if string1 is prefix, postfix or nothing from the string2.

(Use **re** module)

**For Eg-**

**string1: ever**

**string2: evergreen**

**Output: prefix**

1. Write a program to read a string and print

i)Frequency of all characters ii) Word of highest length

iii) The string in title case iv) Read full name as a string and print only the initials.

Eg-

Enter name: **M**ohan **D**as **K**aram **C**hand **Gandhi**

Output string **M D K C Gandhi.**

1. Data can be represented in memory in different ways Binary, Decimal, Octal, and Hexadecimal. Input number in decimal and desired type (Specify B for Binary O for Octal, H for Hexadecimal) for output.

Write a program to perform the conversions-

**SAMPLE INPUT 12**

**DESIRED TYPE B**

**Result: 1100**

**SAMPLE INPUT 25**

**DESIRED TYPE O**

**Result: 41**

1. In Cryptography, a Caesar cipher is a very simple encryption techniques in which each letter in the plain text is replaced by a letter some fixed number of positions down the alphabet list in a cyclic manner. For example, with a shift of 3, A would be replaced by D, B would become E, and so on. The method is named after Julius Caesar, who used it to communicate with his generals. ROT-13 ("rotate by 13 places").

Create menu driven program to encrypt and decrypt which takes in a **string and rotation** (rotate by n places) and encrypts the string then decrypts the string. The program should be menu driven. Also if **rotation** is not specified then the encryption should take place by 13.

1. Write a program that takes a list of numbers prints a histogram to the screen.

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Take a list of numbers and find frequency of each number and plots a histogram as shown above.

1. Consider the following algorithm to generate a sequence of numbers and store them into a list. Start with an integer n. If n is even, divide by 2. If n is odd, multiply by 3 and add 1. Repeat this process with the new value of n, terminating when n = 1.

**For example, the following sequence of numbers will be generated for n = 22:**

**22 11 34 17 52 26 13 40 20 10 5 16 8 4 2 1**

Now do the following on above created list-

* 1. Print total number of elements in the list
  2. Print the sorted list by applying all the sorting techniques and find efficiency of each sorting tech ique
  3. Delete all occurrences of multiples of 10 and print it .

1. Write a program to sort a given list of numbers using Bubble Sort algorithm and print the total number of operations taking place while sorting the given list.
2. Write a program to sort the given list of numbers using Insertion sort algorithm and print the total number of operations taking place while sorting the given list.
3. Write a program which takes 2 digits, X, Y as input and generates a 2-dimensional array. The element value in the i-th row and j-th column of the array should be i\*j.

Note: i=0,1.., X-1; j=0,1,¡Y-1.

**Example**

**Suppose the following inputs are given to the program:**

**3,5**

**Then, the output of the program should be:**

**[[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]**

1. Given below two dictionaries:

**relatives ={"Lisa" : "daughter", "Bart" : "son", "Marge" : "mother", "Homer" : "father", "Santa" : "dog"}**

**ages = {“Lisa” : 8, “Bart”:10,”Marge”:35,”Homer”:40,”Santa”:2}**

Write a code that combines the two dictionaries to generate the following output:

**The Simpsons:**

**Homer is a father and is 40 years old**

**Lisa is a daughter and is 8 years old**

**Bart is a son and is 10 years old**

**Santa is a dog and is 2 years old**

**Marge is a mother and is 35 years old**

1. Write a program that takes a list of words and creates a dictionary with word as the key and number of occurrences of the word as the value.

For example if list is given as ['the','of','an','is','an','the']

Then the dictionary should be d={'the':2,'of':1,'an':2,'is':1}

1. Write a program that takes a list of words and creates a dictionary with frequency (no of occurrences) of word as key and list of words for that frequency as value.

For example if list is given as ['the','of','an','is','an','the']

Then dictionary should be {2:['the','an'],1:['of','is']}

33.Write a program to create a dictionary of names of flowers as keys and the colours in which they exist as values in tuples, for example D={'rose':('red','black','pink'),'lily':('white','violet')} . Now write a code to print

a) The flower which exists in maximum number of colors  
b) The colour in which most of the flowers exist

34.There are 36 possible combinations, if we throw two dice. A simple pair of loops over range (6) +1 will enumerate all combinations. The sum of the two dice is more interesting than the actual combination. Create a dictionary of all combinations, using the sum of numbers on the two dice as the key. Each value of dictionary will be a tuple with all possible combination.

**Section B- SQL Questions**

Q1. Create the table given with the structure given as

**No(primary key), Qty** as integer values,

**Title, author, subject and publisher** as string values

**Price(not null)** as decimal value.

Now after inserting the records as shown in the table write the SQL query for (i) to (vii)

**RELATION: BOOKHOUSE**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Title** | **Author** | **Subject** | **Publisher** | **Qty.** | **Price** |
| 1 | Data Structure | Lipschute | DS | McGraw | 4 | 217.00 |
| 2 | DOS Guide | Nortron | OS | PHI | 3 | 175.00 |
| 3 | Turboc C++ | Robort Lafore | Prog | Galgotia | 5 | 270.00 |
| 4 | Dbase Dummies | Palmer | DBMS | PustakM | 7 | 130.00 |
| 5 | Mastering Windows | Cowart | OS | BPB | 1 | 225.00 |
| 6 | Computer Studies | French | FND | Galgotia | 2 | 75.00 |
| 7 | COBOL | Stern | Prog | John W | 4 | 1000.00 |
| 8 | Guide Network | Freed | NET | Zpress | 3 | 200.00 |
| 9 | Basic for Beginners | Norton | Prog | BPB | 3 | 40.00 |
| 10 | Advanced Pascal | Schildt | Prog | McGraw | 4 | 350.00 |

I)Display title of all books with price between 100 and 300

Ii)Display title and author of all the books having type “Prog” and published by BPB.

iii) Display number of books and average price for each type of publisher

Iv) Display title, price in descending order of price

V) Display all the books where title starts with “D” and qty is more than 3.

Vi)Display publisher wise total stock value (Qty \* price)

Vii)Display title of the book which is costliest.

Q2 Create the table **Order** given with the structure given as

**Orderno(primary key),Orders ,Payments** as integer values,

**Cname(company name, distinct values),cloc(company location),**as string values

**OrderDate(Not null )** as date type value

After inserting the records shown in the table write the SQL query for (1) to (5)

**Table : Order**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Orderno** | **Orderdate** | **CName** | **Cloc** | **Orders(inRs)** | **Payments(inRs)** |
| **1** | **12/02/2008** | **Avlon** | **Delhi** | **100000** | **90000** |
| **2** | **21/11/2008** | **Parason** | **Jaipur** | **230000** | **230000** |
| **3** | **15/10/2008** | **Trident** | **Raipur** | **120000** | **100000** |
| **4** | **13/1/2008** | **Avlon** | **Jaipur** | **240000** | **240000** |
| **5** | **17/7/2008** | **Trident** | **Delhi** | **340000** | **310000** |
| **7** | **16/6/2008** | **Nalco** | **Chennai** | **140000** | **140000** |

1. Add a new column Discount\_percent to hold decimal values.
2. Display all distinct companies listed in the table
3. Add values under Discount\_percent column such that 10% discount is given to those companies who have made full payments.
4. Find number of companies and average orders given to the company city wise.
5. List all orders given between 1/1/2008 to 12/10/2008.

Q.3. Given below a table **FAMILY.** Write SQL queries for the following:

# TABLE: FAMILY

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Family\_name | **Female\_Members** | **Male\_Members** | **Income** | **Occupation** |
| **Mirsa** | **2** | **2** | **20000** | **Service** |
| **Tyagraja** | **1** | **2** | **28000** | **Business** |
| **Joshi** | **2** | **3** | **18000** | **Service** |
| **Khan** | **3** | **2** | **25000** | **Service** |
| **Gupta** | **2** | **1** | **10000** | **Farming** |
| **Rao** | **1** | **3** | **30000** | **Business** |
| **Yadav** | **1** | **2** | **20000** | **Farming** |
| **Chaddha** | **3** | **1** | **50000** | **Business** |

1. Display **occupation** and **average income** as per their occupation.
2. Display **family** having **lowest income**.
3. List all those **families** where female members are *less than 3*, in *ascending order* of their **income.**
4. How many types of **occupation** are listed in table.
5. Display a *report* showing **total members** and **average per capita income** of each family.

.

Q4. Create a table consignor with CnorId defined as primary key in Consignor table and defined as foreign key in consignee table. After inserting the shown records,  **write SQL query for (i) to (v)**

**RELATION: CONSIGNOR**

|  |  |  |  |
| --- | --- | --- | --- |
| **CnorID** | **CnorName** | **CnorAddress** | **City** |
| **ND01** | **R. Singhal** | **24, ABC Enclave** | **New Delhi** |
| **ND02** | **Amit Kumar** | **123, Palm Avenue** | **New Delhi** |
| **MU15** | **R. Kohli** | **5/A, South Street** | **Mumbai** |
| **MU50** | **S. Kaur** | **27-K, Westend** | **Mumbai** |

**RELATION: CONSIGNEE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CneeID** | **CnorID** | **CneeName** | **CneeAddress** | **CneeCity** |
| **MU05** | **ND01** | **Rahul Kishore** | **5, Park Avenue** | **Mumbai** |
| **ND08** | **ND02** | **P. Dhingra** | **16/J, Moore Enclave** | **New Delhi** |
| **KO10** | **MU15** | **A P Roy** | **2A, Central Avenue** | **Kolkata** |
| **MU32** | **ND02** | **S. Mittal** | **P 245, AB Colony** | **Mumbai** |
| **ND48** | **MU50** | **B P Jain** | **13, Block D, A Vihar** | **New Delhi** |

1. Display name of all the consignors from Mumbai
2. List the all the CnorName,Cneename and Cneecity
3. List all the city and no of consignee belonging to that city
4. List all the CnorName and Cneename where consignor city is same as CneeCity
5. Arrange the rows in ascending order of city from Consignee table

Q.5 Create the tables **Doctor** and **Patient** by choosing the appropriate data types for all attributes. Insert the shown records in these tables and write the required queries for 1-5

**TABLE : DOCTOR**

|  |  |  |  |
| --- | --- | --- | --- |
| **Doc\_no** | **Name** | **Department** | **Cons\_fee** |
| **D1** | **Dr. Garg** | **Cardiology** | **500** |
| **D3** | **Dr. Rakesh Jain** | **Pediatric** | **250** |
| **D4** | **Dr. Ajay Kumar** | **Physician** | **150** |
| **D6** | **Dr. Seema Patil** | **Cardiology** | **450** |
| **D9** | **Dr. Abha Verma** | **Pediatric** | **300** |

**TABLE : PATIENT**

|  |  |  |  |
| --- | --- | --- | --- |
| **pno** | **Name** | **Dt\_birth** | **Doc\_no** |
| **P2** | **Suraj** | **12-11-1969** | **D1** |
| **P4** | **Feroj** | **23-2-1980** | **D6** |
| **P5** | **Jai Prakash** | **3-10-1990** | **D4** |
| **P7** | **Anshul** | **1-6-2005** | **D3** |
| **P9** | **Zarina** | **4-9-2004** | **D9** |

1. List department wise number of doctors in the department along with their average consultation fee.
2. List the name of doctors who are taking consultation fee more than the average consultation fee.
3. List Doctor Name along with the name of patient they are treating.
4. Name the youngest patient.
5. Display patient name and their age as on today.

**Section C- Mongo DB**

**Consider the following structure of 'restaurants' collection:**

{

"**address": {**

**"building": "1007",**

**"coord": [ -73.856077, 40.848447 ],**

**"street": "Morris Park Ave",**

**"zipcode": "10462"**

**},**

**"borough": "Bronx",**

**"cuisine": "Bakery",**

**"grades": [**

**{ "date": { "$date": 1393804800000 }, "grade": "A", "score": 2 },**

**{ "date": { "$date": 1378857600000 }, "grade": "A", "score": 6 },**

**{ "date": { "$date": 1358985600000 }, "grade": "A", "score": 10 },**

**{ "date": { "$date": 1322006400000 }, "grade": "A", "score": 9 },**

**{ "date": { "$date": 1299715200000 }, "grade": "B", "score": 14 }**

**],**

**"name": "Morris Park Bake Shop",**

**"restaurant\_id": "30075445"**

**}**

1.Write a MongoDB query to display all the documents in the collection restaurants.

2.Write a MongoDB query to display the fields restaurant\_id, name, borough and cuisine for all the documents in the collection restaurant.

3.Write a MongoDB query to display the fields restaurant\_id, name, borough and cuisine, but exclude the field \_id for all the documents in the collection restaurant.

4.Write a MongoDB query to display the fields restaurant\_id, name, borough and zip code, but exclude the field \_id for all the documents in the collection restaurant

5.Write a MongoDB query to display all the restaurant which is in the borough Bronx.

6.Write a MongoDB query to display the first 5 restaurant which is in the borough Bronx

7.Write a MongoDB query to display the next 5 restaurants after skipping first 5 which are in the borough Bronx.

8.Write a MongoDB query to find the restaurants who achieved a score more than 90.

9.Write a MongoDB query to find the restaurants that achieved a score, more than 80 but less than 100.

10.Write a MongoDB query to find the restaurants that do not prepare any cuisine of 'American' and their grade score more than 70 and latitude less than -65.754168