Assignment #1

Ques 1:.Write a program to create a function *calculation(),* such that it can accept two variables from the user and return the sum and difference of the numbers. Also, it must return both in a single return call.

Ques 2 .Define a function that accepts any roll number and returns whether the roll number is present or not in the list .
(Hint : Use a list to store sample roll numbers.
Get input from a user and check if the number
exist in the list or not, if exists return present
else return not present)

Ques 3. Define a function which counts vowels and consonants in a word.

Ques 4. A company generates a total revenue of some amount (say x) and has some operational costs associated with it(say y). The net profit generated by this company is given by the formula :

Profit (p) = 3x^2 -100y

Write a program that takes the revenue and operational costs as input, and returns the profit generated. Use the lambda function to calculate the profit.

Ques 5.Using Python, create a module that contains area calculation functions of different shapes (triangle, circle and rectangle). You need to utilize this module in your main program that prompts users to enter the shape type and depending on user input it should return the accurate area calculation results.

Next, you need to create functions within your main program that calculate and display the volume and surface area of a cylinder.

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Ques 6. Write a Python function that evaluates the mathematical functions $f(x)=\cos(2x)$, $f'(x)=-2\sin(2x)$, and $f''(x)=-4\cos(2x)$. Return these three values. Write out the results of these values for $x=\pi$.

[Hint: use in- built *math()* module]

Q7. Write a function called fizz_buzz that takes a number.

a.If the number is divisible by 3, it should return “Fizz”.

b.If it is divisible by 5, it should return “Buzz”.

c.If it is divisible by both 3 and 5, it should return “FizzBuzz”.

d. Otherwise, it should return the same number.

Q8.Write a function that returns the sum of multiples of 3 or 5 between 0 and limit (parameter). For example, if the limit is 20, it should return the sum of 3, 5, 6, 9, 10, 12, 15, 18, 20.

Q9. Write a python program using functions that inputs three vectors from a user and performs the following operations on them:

a. Finds their vector sum and returns the result.
b. Finds their vector dot product and checks for the associativity, and returns the appropriate message along with the value of the dot product.
c. Return all the three norms for the inputted vectors.
d. Finds the Identity and inverse of each of the vectors if they exist.
e. Write a function that checks for orthogonality of the vectors and return True and Name of the vectors which are orthogonal; It should return False if none of the vectors are orthogonal.

Q10. Write a program that inputs two matrices of a given dimension(to be taken from the user), and performs all the basic arithmetic functions on them(+,-,*,/)

Write a different function for each operation and within the function print the result of the operation.