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# SE 113 LAB 7 SAMPLE SOLUTION
# filename: lab7.py
import math

# Q1 Starts Here
def my_function(x): # this part is the function definition
    if (x % 2) == 0:
        print(x, 'is an even number.\n')
    else:
        print(x, 'is an odd number.\n')

num = int(input('Enter a number to check whether it is even or odd: '))
my_function(num) # this part is the function call

# Q1 Ends Here
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# Q2.a Starts Here
def sine_function(d):
    radian = int(d) / 360.0 * 2 * 3.14
    sine = math.sin(radian)
    return sine

degree = input('Write a degree to learn the sine value: ')
print('Sine of', degree, 'is', sine_function(degree), '\n')

# Q2.a Ends Here
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# Q2.b Starts Here
def logarithm_function(b, n):
    return math.log(n,b)

#OR alternatively:
#def logarithm_function(b, n):
#    log = math.log(n)/math.log(b)
#    return log

number = int(input('Enter a value to calculate the logarithm: '))
base = int(input('Enter the base: '))
result = logarithm_function(base, number)
print('The result is:', result, '\n')

# Q2.b Ends Here
# -----

# Q3 Starts Here
def fibonacci(n):
    num1 = 0 # first term of the Fibonacci sequence
    num2 = 1 # second term of the Fibonacci sequence

    if n < 0: # check if the number of terms is valid OR this part can be omitted by the assumption
        print("Enter a non-negative integer")
        return None
    elif n == 0:
        return num1
    elif n == 1:
        return num2
    else:
        count = 1
        while count < n:
            nth = num1 + num2
            num1 = num2
            num2 = nth
            count += 1
        return nth

n = int(input('To calculate the value of Fibonacci number F(n), enter an integer value for n: '))
result = fibonacci(n)
print('Fibonacci number F(n), where n =', n, 'is', result, '\n')

# Q3 Ends Here
# -----

# T0-D0 @ Home a Starts Here
print("To decide whether a given number is even or odd, Enter 1.")
print("To calculate sine of a given degree, Enter 2.")
print("To calculate the logarithm of a given number, Enter 3.")
print("To calculate the Fibonacci value for a given number, Enter 4.\n")

select = input("Select an operation: ")

if select == "1":
    num = int(input('Enter a number to check whether it is even or odd: '))
    my_function(num)

elif select == "2":
    degree = input('Write a degree to learn the sine value: ')
    print('Sine of', degree, 'is', sine_function(degree), '\n')

elif select == "3":
    number = int(input('Enter a value to calculate the logarithm: '))
    base = int(input('Enter the base: '))
    result = logarithm_function(base, number)
    print('The result is:', logarithm_function(base, number), '\n')

elif select == "4":
    n = int(input('To calculate the value of Fibonacci number F(n), enter an integer value for n: '))
    print('Fibonacci number F(n), where n =', n, 'is', fibonacci(n), '\n')

else:
    print("Wrong choice...\n")

# T0-D0 @ Home a Ends Here
# -----

# T0-D0 @ Home b Starts Here
while True:
    print("To decide whether a given number is even or odd, Enter 1.")
    print("To calculate sine of a given degree, Enter 2.")
    print("To calculate the logarithm of a given number, Enter 3.")
    print("To calculate the Fibonacci value for a given number, Enter 4.")
    print("To Exit, Enter 0. \n")
    select = input("Select an operation: ")

    if select == "0":
        print("Exiting the program...")
        break

    elif select == "1":
        num = int(input('Enter a number to check whether it is even or odd: '))
        my_function(num)

    elif select == "2":
        degree = input('Write a degree to learn its sine value: ')
        print('Sine of', degree, 'is', sine_function(degree), '\n')

    elif select == "3":
        number = int(input('Enter a value to calculate its logarithm: '))
        base = int(input('Enter the base: '))
        result = logarithm_function(base, number)
        print('The result is:', logarithm_function(base, number), '\n')

    elif select == "4":
        n = int(input('To calculate the value of Fibonacci number F(n), enter an integer value for n: '))
        print('Fibonacci number F(n), where n =', n, 'is', fibonacci(n), '\n')

    else:
        print("Wrong choice...\n")

# T0-D0 @ Home b Ends Here
# -----
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