Name: بانه بلال إبراهيم , Number:2826, Submitted To GitHub

Question 1:

A--If you have two lists, L1=['HTTP','HTTPS','FTP','DNS'] L2=[80,443,21,53], convert it to generate this dictionary d={'HTTP':80,'HTTPS':443,'FTP':21,'DNS':53 }

باستخدام التابع zip() عن طريقdictionary comprehension

يكون الكود كالتالي:

```
L1 = ['HTTP', 'HTTPS', 'FTP', 'DNS']
L2 = [80, 443, 21, 53]

d = {key: value for key, value in zip(L1, L2)}
print("d=",d)
```

وتكون نتيجة تنفيذ الكود:

```
C:\Users\BANA.IB\PycharmProjects\pythonProject\.venv\Scripts\python.exe
d= {'HTTP': 80, 'HTTPS': 443, 'FTP': 21, 'DNS': 53}

Process finished with exit code 0
```

B- Write a Python program that calculates the factorial of a given number entered by user.

لحساب عاملي (!) عدد مدخل من قبل المستخدم، قمت في الكود التالي ببناء تابع اسمه "factorial" يحسب قيمة عاملي العدد المدخل ثم يأخذ دخل المستخدم ويخزن ضمن المتحول "num" ثم نقوم باستدعاء التابع ونمرر له البارمتر "num" فتكون النتيجة قيمة عاملي العدد تخزن ضمن "result" ، ومن ثم نقوم بطباعة النتيجة عن طريق تعليمة الطباعة:

```
def factorial(n):
    if n == 0:
        return 1
    else:
        return n * factorial(n-1)

num = int(input("Enter a number: "))
result = factorial(num)
print(f"The factorial of {num} is {result}")
```

فتكون نتيجة تنفيذ التابع عند ادخال العدد 4 مثلاً:

```
C:\Users\BANA.IB\PycharmProjects\pythonProject\.venv\Scripts
Enter a number: 4
The factorial of 4 is 24

Process finished with exit code 0
```

وعند ادخال العدد 0:

```
C:\Users\BANA.IB\PycharmProjects\py
Enter a number: 0
The factorial of 0 is 1
```

C- L=['Network' , 'Bio' , 'Programming', 'Physics' , 'Music'] In this exercise, you will implement a Python program that reads the items of the previous list and identifies the items that starts with 'B' letter, then print it on screen. Tips: using loop, 'len ()' , startswith() methods.

لطباعة الكلمات التي تبدأ بحرف "B" من عناصر هذه المصفوفة، قمت باستخدام حلقة امرر فيها عناصر القائمة وعن طريق التابع "startswith" مع تمرير بارمتر حرف "B" نحصل على الخرج المطلوب، فيكون الكود كالتالي:

```
1  L = ['Network', 'Bio', 'Programming', 'Physics', 'Music']
2  for i in L:
3      if i.startswith('B'):
4          print(i)
5
6
```

وتكون نتيجة تنفيذ التابع:

```
C:\Users\BANA.IB\PycharmProjects\pythonProject\.venv\Sc
Bio

Process finished with exit code 0
```

D- Using Dictionary comprehension, Generate this dictionary
d={0:1,1:2,2:3,3:4,4:5,5:6,6:7,7:8,8:9,9:10,10:11}

نلاحظ في القاموس المطلوب طباعته، القيمة أقل بواحد من المفتاح، وعن طريق "dictionary comprehension" تمرر الأرقام بالتتالي ضمن العظمى "11"

وباستخدام تعليمة الطباعة نحصل على الخرج المطلوب، فيكون الكود كالتالي:

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```
d = {x: x+1 for x in range(11)}
print("d=",d)
```

وتكون نتيجة التنفيذ:

```
C:\Users\BANA.IB\PycharmProjects\pythonProject\.venv\Scripts\python.exe "C:\Us
d= {0: 1, 1: 2, 2: 3, 3: 4, 4: 5, 5: 6, 6: 7, 7: 8, 8: 9, 9: 10, 10: 11}

Process finished with exit code 0
```

Question 2: Convert from Binary to Decimal

Write a Python program that converts a Binary number into its equivalent Decimal number. The program should start reading the binary number from the user. Then the decimal equivalent number must be calculated. Finally, the program must display the equivalent decimal number on the screen. Tips: solve input errors.

الكود التالي يحول العدد الثنائي المدخل إلى مكافئه العشري:

```
1 usage
def binary_to_decimal(binary):
    decimal = 0
    for digit in binary:
        if digit != '0' and digit != '1':
            return "Invalid input. Please enter a valid binary number."
        decimal = decimal * 2 + int(digit)
    return decimal

binary_number = input("Enter a binary number: ")
decimal_number = binary_to_decimal(binary_number)

print(f"The decimal equivalent of {binary_number} is: {decimal_number}")
```

هذا البرنامج يقرأ العدد الثنائي المدخل من قبل المستخدم ويحوله إلى مكافئه العشري ثم يعرض النتيجة، بالإضافة إلى أنه يتضمن معالجة للأخطاء في حال أدخل المستخدم قيمة غير مقبولة (غير ثنائية).

في حال إدخال العدد 4 مثلاً، قيمة غير ثنائية وبالتالي ستكون نتيجة التنفيذ:

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```
C:\Users\BANA.IB\PycharmProjects\pythonProject\.venv\Scripts\python.exe "C:\Users\BA
Enter a binary number: 4
The decimal equivalent of 4 is: Invalid input. Please enter a valid binary number.

Process finished with exit code 0
```

وتكون نتيجة تنفيذ الكود عند إدخال 1111:

```
C:\Users\BANA.IB\PycharmProjects\pythonProject\.venv\Scripts\python.exe
Enter a binary number: 1111
The decimal equivalent of 1111 is: 15

Process finished with exit code 0
```

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Question 3: Working with Files" Quiz Program"

Type python quiz program that takes a text or json or csv file as input for (20 (Questions, Answers)). It asks the questions and finally computes and prints user results and store user name and result in separate file csv or json file

```python
import csv

questions_file_name= "quiz_questions.csv"
answers_file_name= "quiz_answers.csv"

user_answers = []

questions_file = open(questions_file_name, mode="r", newline="", encoding="utf-8")
dict = csv.DictReader(questions_file, fieldnames=["q", "a"])

for question in dict:
    if (question["q"] == "q"): continue
    answer = input(question['q'] + "? ")
    is_correct = answer == question['a']

    user_answers.append(
        {"q": question["q"], "a": answer, "correct": is_correct}
    )
questions_file.close()

answers_file = open(answers_file_name, mode = "w", newline="", encoding="utf-8")
writer = csv.DictWriter(answers_file, fieldnames=["q", "a", "correct"])
writer.writeheader()
writer.writerows(user_answers)
answers_file.close()


```

انشاء ملف باسم quiz_question.csv مؤلف من عمودين (سؤال وجواب)، كل سطر يحتوي سؤال وجوابه:

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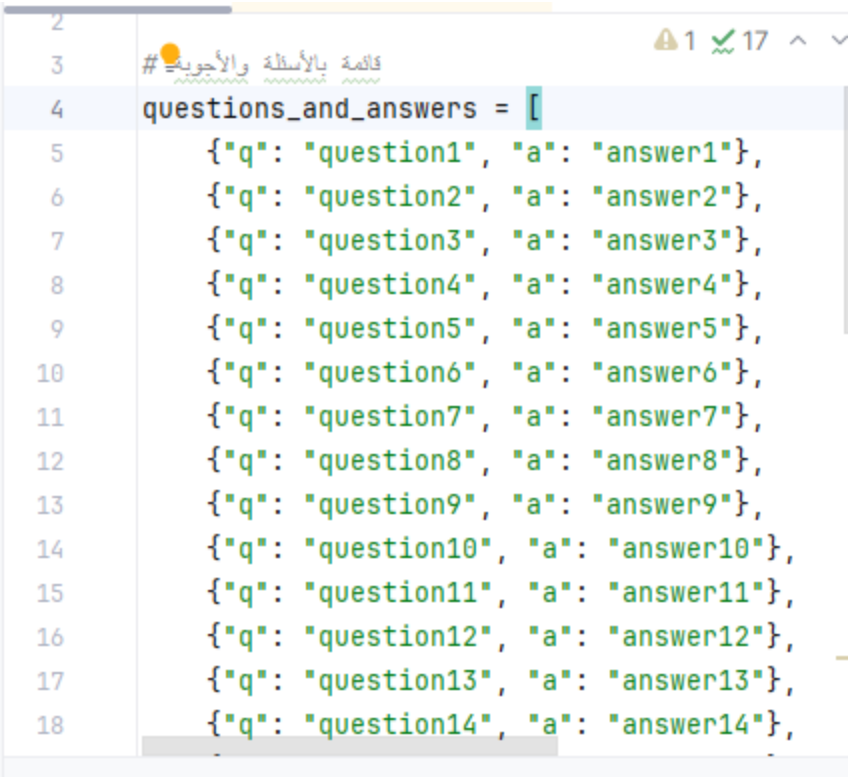

```
#قائمة بالأسئلة والأجوبة
questions_and_answers = [
    {"q": "question1", "a": "answer1"},
    {"q": "question2", "a": "answer2"},
    {"q": "question3", "a": "answer3"},
    {"q": "question4", "a": "answer4"},
    {"q": "question5", "a": "answer5"},
    {"q": "question6", "a": "answer6"},
    {"q": "question7", "a": "answer7"},
    {"q": "question8", "a": "answer8"},
    {"q": "question9", "a": "answer9"},
    {"q": "question10", "a": "answer10"},
    {"q": "question11", "a": "answer11"},
    {"q": "question12", "a": "answer12"},
    {"q": "question13", "a": "answer13"},
    {"q": "question14", "a": "answer14"},
```

بعد تنفيذ البرنامج يطلب من المستخدم ادخال اسمه، يسأل الأسئلة بالتتالي، يحسب النتيجة، يعرض النتيجة للمستخدم، ويخزن اسمه ونتيجته في ملف اسمه quiz_answers_csv كالتالي:

Name: بانه بلال إبراهيم , Number:2826, Submitted To GitHub

```
q,a,correct
question1,answer2,False
question2,vcdv,False
question3,fgnf,False
question4,chsn,False
question5,vcbv,False
question6,j,False
question7,hgjhg,False
question8,ghf,False
question9,hghj,False
question10,ggdh,False
question11,gf,False
question12,h,False
question13,vhn,False
question14,b,False
```

يكون خرج تنفيذ التابع: بحيث يسأل 20 سؤال..

```
question1? answer1
question2? answer2
question3? answer3
question4? answer4
question5? answer5
question6?
```

Question 4: Object-Oriented Programming - Bank Class

Define a class BankAccount with the following attributes and methods: Attributes: account_number (string), account_holder (string), balance (float, initialized to 0.0) Methods:deposit(amount), withdraw(amount) , get_balance() - Create an instance of BankAccount, - Perform a deposit of $1000, - Perform a withdrawal of $500. - Print the current balance after each operation. - Define a subclass SavingsAccount that inherits from BankAccount and adds interest_rate Attribute and apply_interest() method that Applies interest to the balance based on the interest rate. And Override print() method to print the current balance and rate. - Create an instance of SavingsAccount , and call apply_interest() and print() functions

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```python
# Define BankAccount class
2 usages
class BankAccount:
    def __init__(self, account_number, account_holder):
        self.account_number = account_number
        self.account_holder = account_holder
        self.balance = 0.0

    3 usages
    def deposit(self, amount):
        self.balance += amount

    1 usage
    def withdraw(self, amount):
        if self.balance >= amount:
            self.balance -= amount
        else:
            print("Insufficient funds")

    3 usages
    def get_balance(self):
        return self.balance

# Create an instance of BankAccount
bank_acc = BankAccount( account_number: "123456",  account_holder: "Bana")

# Perform deposit and withdrawal
```

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```python
# Perform deposit and withdrawal
bank_acc.deposit(1000)
print("Balance after deposit: $", bank_acc.get_balance())
bank_acc.withdraw(500)
print("Balance after withdrawal: $", bank_acc.get_balance())

# Define SavingsAccount subclass
1 usage
class SavingsAccount(BankAccount):
    def __init__(self, account_number, account_holder, interest_rate):
        super().__init__(account_number, account_holder)
        self.interest_rate = interest_rate

    1 usage
    def apply_interest(self):
        interest_amount = self.balance * (self.interest_rate / 100)
        self.deposit(interest_amount)

    1 usage
    def print_info(self):
        print("Current balance: $", self.get_balance())
        print("Interest rate: ", self.interest_rate)

# Create an instance of SavingsAccount
savings_acc = SavingsAccount( account_number: "789012", account_holder: "Sam", interest_rate: 5)
savings_acc.deposit(2000)
savings_acc.apply_interest()
savings_acc.print_info()
```

وتكون نتيجة تنفيذ خرج التابع:

```
C:\Users\BANA.IB\PycharmProjects\pythonProject\.venv\Scripts\python.exe
Balance after deposit: $ 1000.0
Balance after withdrawal: $ 500.0
Current balance: $ 2100.0
Interest rate:  5

Process finished with exit code 0
```