الجُمْهُورِيّةُ اَلْعَرَبِيَّةُ اَلسُّورِيَّة
وِزَارَةُ التَّعْلِيمِ الْعَالِيْ وَالْبَحث العِلْمِيْ
جَامِعَةُ تِشرِيْن - السَّنَة الخَامِسَة
كِلِيّة الهَندَسةِ الميكانِيكيّة والكَهرَبَائِيَّة
هَنْدَسَةُ الإِتّصَالَاتِ وَالإِلكترُونِيّاتْ

First Network Programming Homework

إِشْرَافْ:
الدّكتور المُهَندِسْ مُهنّد عِيسَى

إِعدَادْ وَتَقدِيمْ:

المقداد بسّام مسلّم
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العَام الدّراسِي
2023 - 2024
1444 - 1445

Question 1: Python Basic

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 } .

Solve:

```python
import termcolor
import pyfiglet
# Definition of the first list
L1 = ['HTTP', 'HTTPS', 'FTP', 'DNS']
# Definition of the second list
L2 = [80, 443, 21, 53]
# convert it to dictionary
d = dict(zip(L1, L2))
# Show the output to verify the answer
print(d)
print(termcolor.colored(pyfiglet.figlet_format("supervised by Dr. Muhannad Issa"), color="green"))
```

Output:

```
PS C:\Users\admin\Desktop\networkhomework> & C:/Users/admin/AppData/Local/Programs/Python/Python311/python.exe c:/Users/admin/Desktop/networkhomework/question
1A.py
{'HTTP': 80, 'HTTPS': 443, 'FTP': 21, 'DNS': 53}
```

Explanation:

The zip function is used to pair the corresponding elements from the previous two lists and then convert the resulting pairs into a dictionary named "d".

Python File Name:

question1A.py

.....

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

Solve:

```python
import termcolor
# تعريف تابع يقوم بحساب عاملي أي عدد
def factorial_question1B(n):
    factorial_sum = 1
    for i in range(1, n + 1):
        factorial_sum = factorial_sum * i
    return factorial_sum
# ادخال عدد من قبل المستخدم أكبر من صفر
num = int(input("Enter a number greater than or equal to zero "))
# هنا تتم معالجة حالة ادخال عدد أقل من صفر
if num < 0:
    print("I told you earlier to enter a number greater than zero because there is no factorial for negative numbers")
# حالة الادخال الصحيح والحساب
else:
    print(termcolor.colored("The Factorial of", color="red"), end=" ")
    print(f"{num} is : {factorial_question1B(num)}")
```

Output:

```
PS C:\Users\admin\Desktop\networkhomework> & C:/Users/admin/AppData/Local/Programs/Python/Python311/python.exe c:/Users/admin/Desktop/networkhomework/quesion1
B.py
Enter a number greater than or equal to zero -5
I told you earlier to enter a number greater than zero because there is no factorial for negative numbers
PS C:\Users\admin\Desktop\networkhomework> & C:/Users/admin/AppData/Local/Programs/Python/Python311/python.exe c:/Users/admin/Desktop/networkhomework/quesion1
B.py
Enter a number greater than or equal to zero 4
The Factorial of 4 is : 24
```

Explanation:

Using range makes us very comfortable with the ability to pass through numbers from one up to the entered number.

It is worth noting that the end of range increases the entered number by one digit because its mechanism of action is to reach the number that precedes the end of its definition.

Python File Name:

question1B.py

.....

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.

Solve:

```python
# تعريف القائمة المكتوبة في السؤال
L = ['Network', 'Bio', 'Programming', 'Physics', 'Music']
# المرور على عناصر القائمة عنصر تلو العنصر
for word in L:
    # شرط التحقق فيما إذا كان العنصر طولة أكبر من 1 ويبدأ بالحرف المطلوب
    if len(word) > 0 and word.startswith('B'):
        print(f"'{word}' : start with letter 'B'")
    else:
        print(f"sorry, '{word}' does not start with letter 'B' ")

```

Output:

```
PS C:\Users\admin\Desktop\networkhomework> & C:/Users/admin/AppData/Local/Programs/Python/Python311/python.exe c:/Users/admin/Desktop/networkhomework/question
1C.py
sorry, 'Network' does not start with letter 'B'
'Bio' : start with letter 'B'
sorry, 'Programming' does not start with letter 'B'
sorry, 'Physics' does not start with letter 'B'
sorry, 'Music' does not start with letter 'B'
```

Explanation:

We Define the list, then go through its elements through a loop, then check for the presence of an element that begins with the letter B, then print it. If it does not exist, we print a message that it does not exist.

Python File Name:

question1C.py

.....

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}

Solve:

```
# في البداية أحتاج إلى قاموس فارغ مع التزام بأسم القاموس حسب السؤال
d = {}
# باستخدام "رينج" سأبدا من 0 وأنتهي ب 10 لأنها تصل للعنصر قبل الأخير الموجود ضمن قوسيها
for almekdad in range(11):
    # بما أن الانديكس يبدأ من صفر فإن كل انديكس هو مفتاح تكون قيمته هو الانديكس مضافًا له واحد
    d[almekdad] = almekdad + 1
# طباعة القاموس للتحقق
print(d)
```

Output:

```
PS C:\Users\admin\Desktop\networkhomework> & C:/Users/admin/AppData/Local/Programs/Python/Python311/python.exe c:/Users/admin/Desktop/network
homework/question1D.py
{0: 1, 1: 2, 2: 3, 3: 4, 4: 5, 5: 6, 6: 7, 7: 8, 8: 9, 9: 10, 10: 11}
```

Explanation:

The solution to the question is explained in the first image within the code, which indicates an understanding of dictionaries.

Python File Name:

question1D.py

.....

Question 2: Convert From Binary To Decimal PAGE 1 / 1

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.

Solve:

```python
Decimal_numbers = [1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, 65536, 131072,
                   262144, 524288, 1048576, 2097152, 4194304, 8388608, 16777216, 33554432, 67108864, 134217728,
                   268435456, 536870912, 1073741824, 2147483648, 4294967296, 8589934592, 17179869184, 34359738368,
                   68719476736, 137438953472, 274877906944, 549755813888, 1099511627776, 2199023255552, 4398046511104,
                   8796093022208, 17592186044416, 35184372088832, 70368744177664, 140737488355328, 281474976710656,
                   562949953421312, 1125899906842624, 2251799813685248, 4503599627370496, 9007199254740992,
                   18014398509481984, 36028797018963968, 72057594037927936, 144115188075855872, 288230376151711744,
                   576460752303423488, 1152921504606846976, 2305843009213693952, 4611686018427387904, 9223372036854775808,
                   18446744073709551616]

binary_num = str(input("HELLO, Please Enter a binary number: "))

if all(char in {'0', '1'} for char in binary_num):
    sum = 0
    for i in range(len(binary_num)):
        if binary_num[-i-1] == '1':
            sum += Decimal_numbers[i]
    print("Decimal Number for the Binary input is : ", sum)
else:
    print("OOPS, I think you made random entries, my friend. Stick to binary numbers that contain only zeros and ones")
```

Output:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  COMMENTS

PS C:\Users\admin\Desktop\networkhomework> & C:/Users/admin/AppData/Local/Programs/Python/Python311/python.exe c:/Users/admin/Desktop/networkhomework/question2.py
HELLO, Please Enter a binary number: 11111111001111
Decimal Number for the Binary input is :  16335
```

Explanation:

A list containing numbers from 1 to multiples of one was defined because the solution method is not similar to anyone and because it is the traditional method used in mental arithmetic, A value is entered by the user and read as text We check that the text is composed of zeros and ones After that, we start from the right of the text and multiply each character after converting it to a number by its counterpart from the matrix of decimal numbers from the left.

Python File Name:

question2.py

.....

Question 3: Working With Files "Quiz Program" PAGE 1 / 3

Type python quiz program that takes a text or json or csv file as input for (20(Questions-Answers)).

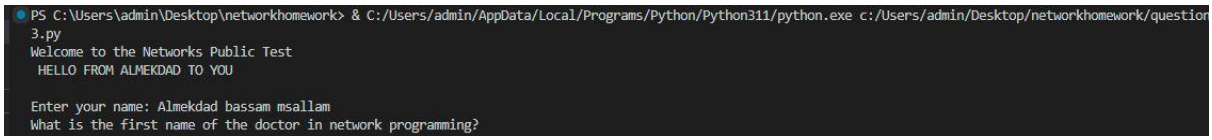
It asks the questions and finally computes and prints user results and store user name and result in separate file csv or json file.

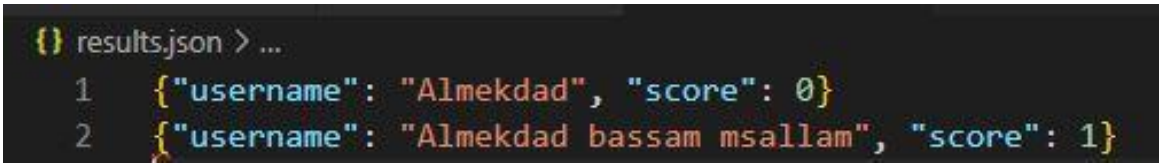
Solve:

```python
# استيراد مكتبة الجيسون ومن الضروري الانتباه لتثبيتها قبل العمل بها
# من الجدير بالذكر أن ملف الأسئلة المُختار تم اختياره من أرض الواقع بمادة الشبكات
import json
# التابع سيقوم بالحصول على ملف الأسئلة عند اعطائه اسم الملف لاحقًا
def view_all_question(file_path):
    with open(file_path, 'r') as file:
        questions = json.load(file)
    return questions
# التابع سيقوم بحفظ نتيجة الاختبار ضمن ملف وفي كل مرة ينزل سطر
def save_student_result(username, score):
    result = {"username": username, "score": score}
    with open("results.json", 'a') as file:
        json.dump(result, file)
        file.write('\n')
# التابع سيقوم بعرض نتيجة الطالب على الشاشة
def admin_view_results():
    with open("results.json", 'r') as file:
        results = file.readlines()
        for result in results:
            print(result.strip())
# تابع يقوم بأخذ بارامتر الأسئلة التي تم قراءتها
def quiz_programme(questions):
    # تبدأ نتيجة الطالب النهائية من صفر وهذا أمر إجباري ومنطقي
    score = 0
    total_questions = len(questions)
    # بكل مرة يتم المرور على الأسئلة سؤال سؤال
    for question in questions:
        #عرض السؤال على الطالب
        print(question['question'])
        #انتظار إجابة الطالب
        user_answer = input("iam sure that answer is: ").strip().lower()
        # بحال تطابق الإجابة مع قيمة المتغير يتم احتساب علامة للطالب
        if user_answer == question['answer'].strip().lower():
            score += 1
    # بنهاية الأمر يعود من التابع قيمتان رئيسيتان هما العلامة ومجموع الأسئلة
    return score, total_questions

# بداية عرض البرنامج بشاشة ترحيب
print("Welcome to the Networks Public Test \n HELLO FROM ALMEKDAD TO YOU \n")
# انتظار ادخال اسم الطالب
username = input("Enter your name: ")
# قراءة الأسئلة
questions = view_all_question("questions.json")
user_score, total_questions = quiz_programme(questions)
# عرض النتيجة على الشاشة باستخدام التوابع السابقة
print(f"Your score is: {user_score} from {total_questions}, THANK YOU")
# حفظ النتيجة
save_student_result(username, user_score)
```

Question 3: Working With Files "Quiz Program" PAGE 2 / 3

Output:





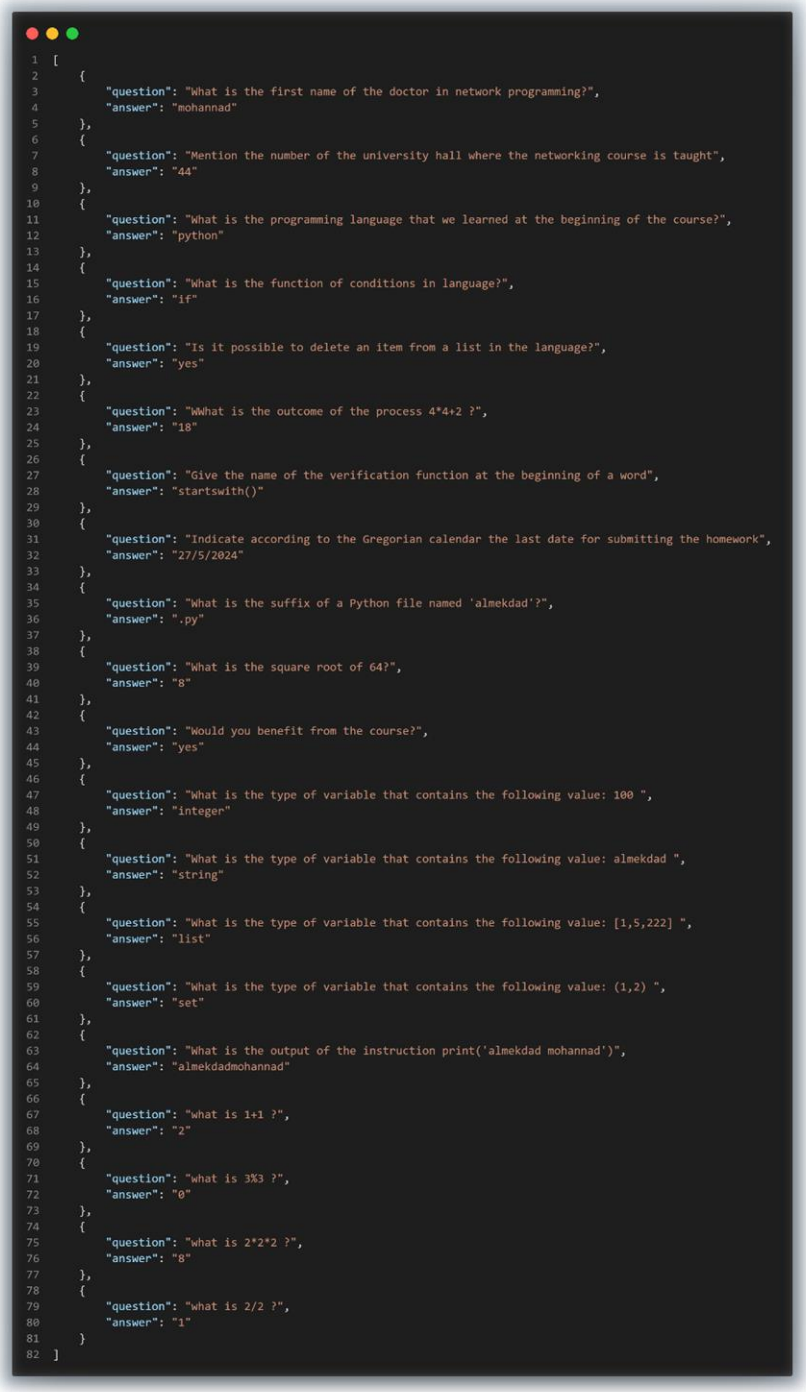
Explanation:

The explanation has been written on the pictures and a screenshot of the Jason file will be attached.

Note that the questions were written manually and they talk about the network programming subject at Tishreen University under the supervision of Dr. Muhannad Issa.

Question 3: Working With Files "Quiz Program" PAGE 3 / 3

Questions json file:



```json
[
    {
        "question": "What is the first name of the doctor in network programming?",
        "answer": "mohannad"
    },
    {
        "question": "Mention the number of the university hall where the networking course is taught",
        "answer": "44"
    },
    {
        "question": "What is the programming language that we learned at the beginning of the course?",
        "answer": "python"
    },
    {
        "question": "What is the function of conditions in language?",
        "answer": "if"
    },
    {
        "question": "Is it possible to delete an item from a list in the language?",
        "answer": "yes"
    },
    {
        "question": "WWhat is the outcome of the process 4*4+2 ?",
        "answer": "18"
    },
    {
        "question": "Give the name of the verification function at the beginning of a word",
        "answer": "startswith()"
    },
    {
        "question": "Indicate according to the Gregorian calendar the last date for submitting the homework",
        "answer": "27/5/2024"
    },
    {
        "question": "What is the suffix of a Python file named 'almekdad'?",
        "answer": ".py"
    },
    {
        "question": "What is the square root of 64?",
        "answer": "8"
    },
    {
        "question": "Would you benefit from the course?",
        "answer": "yes"
    },
    {
        "question": "What is the type of variable that contains the following value: 100 ",
        "answer": "integer"
    },
    {
        "question": "What is the type of variable that contains the following value: almekdad ",
        "answer": "string"
    },
    {
        "question": "What is the type of variable that contains the following value: [1,5,222] ",
        "answer": "list"
    },
    {
        "question": "What is the type of variable that contains the following value: (1,2) ",
        "answer": "set"
    },
    {
        "question": "What is the output of the instruction print('almekdad mohannad')",
        "answer": "almekdadmohannad"
    },
    {
        "question": "what is 1+1 ?",
        "answer": "2"
    },
    {
        "question": "what is 3%3 ?",
        "answer": "0"
    },
    {
        "question": "what is 2*2*2 ?",
        "answer": "8"
    },
    {
        "question": "what is 2/2 ?",
        "answer": "1"
    }
]
```

Python File Name:

question3.py

.....

Question 4: Object-Oriented Programming - Bank Class PAGE 1 / 2

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.

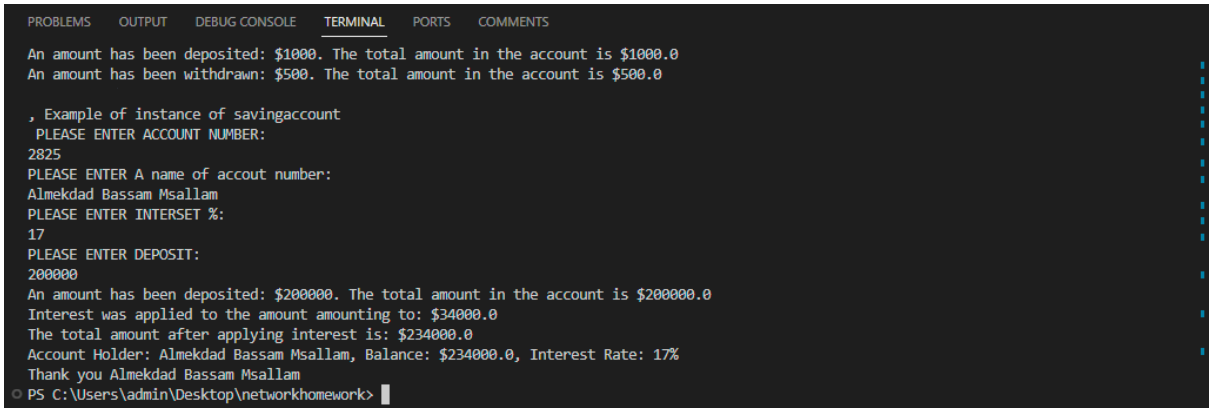
- Create an instance of SavingsAccount , and call apply_interest() and print() functions.

Solve:

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

    def deposit(self, amount):
        if amount > 0:
            self.balance += amount
            print(
                f"An amount has been deposited: ${amount}. The total amount in the account is ${self.balance}")
        else:
            print("It is impossible for the deposit to be a negative number, please contact the customer service center")

    def withdraw(self, amount):
        if 0 < amount <= self.balance:
            self.balance -= amount
            print(
                f"An amount has been withdrawn: ${amount}. The total amount in the account is ${self.balance}")
        else:
            print(
                f"Wrong entry, or the total value of the account is less than the amount to be withdrawn. The total value of the account is: ${self.balance}")

    def get_balance(self):
        return self.balance


class SavingsAccount(BankAccount):
    def __init__(self, account_number, account_holder, interest_rate, balance=0.0):
        super().__init__(account_number, account_holder, balance)
        self.interest_rate = interest_rate

    def apply_interest(self):
        interest = self.balance * (self.interest_rate / 100)
        self.balance += interest
        print(
            f"Interest was applied to the amount amounting to: ${interest}")
        print(f"The total amount after applying interest is: ${self.balance}")

    def __str__(self):
        return f"Account Holder: {self.account_holder}, Balance: ${self.balance}, Interest Rate: {self.interest_rate}%"


account = BankAccount("2825", "Almekdad Bassam Msallam")
account.deposit(1000)
account.withdraw(500)

print("\n, Example of instance of savingaccount\n PLEASE ENTER ACCOUNT NUMBER: ")
x = input()
print("PLEASE ENTER A name of accout number: ")
y = input()
print("PLEASE ENTER INTERSET %: ")
z = int(input())
print("PLEASE ENTER DEPOSIT: ")
zz = int(input())
savings_account = SavingsAccount(x, y, z)
savings_account.deposit(zz)
savings_account.apply_interest()
print(savings_account)
print(f"Thank you {y} ")
```

Question 4: Object-Oriented Programming - Bank Class PAGE 2 / 2

Output:



Explanation:

The deposit tracker takes the value of the deposit amount and checks whether the amount entered is a positive value. If it is a positive value, it is added to the total account.

The withdrawal follower takes the value of the withdrawal amount and checks whether the amount to be withdrawn is a lower value or settles the amount in the total account, otherwise an error message appears.

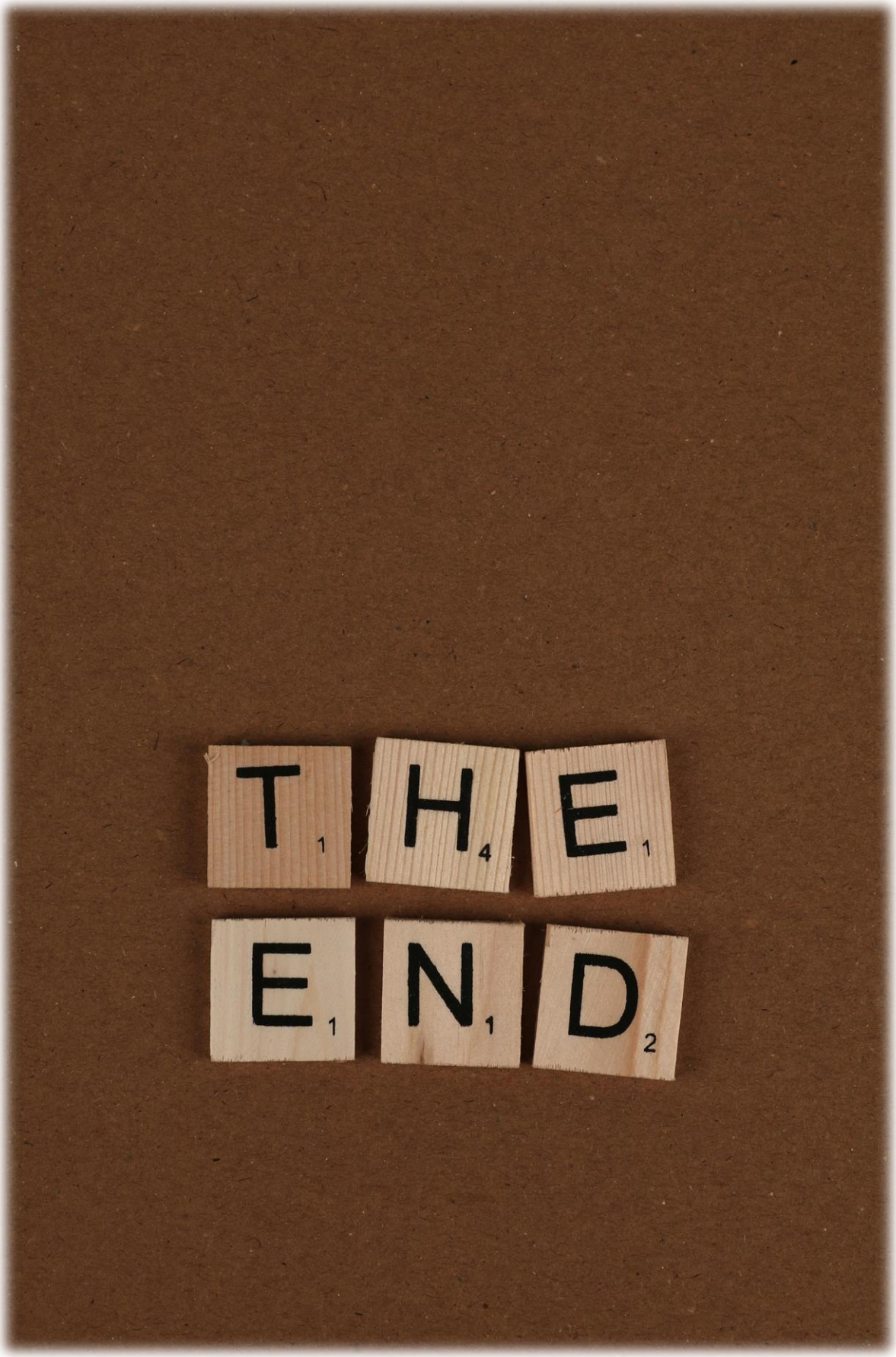
The interest calculation function is a simple function, just multiply the value of the entered amount by the interest value as a percentage and return the value.

There are only examples, and the possibility of user-made choices as a form of better and more durable code could be added.

Python File Name:

question4.py

.....


THE
END