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## First Network Programming Homework

### Question 1: Python Basics?

- 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}

**Answer:**

```
l1 = ['HTTP', 'HTTPS', 'FTP', 'DNS']  
l2 = [80, 443, 21, 53]  
d = dict(zip(l1, l2))  
print(d)
```

A screenshot of a Windows PowerShell terminal window. The title bar shows 'Python' and standard window controls. The terminal text includes the Windows PowerShell prompt, copyright information, and the execution of a Python script. The output of the script is a dictionary: {'HTTP': 80, 'HTTPS': 443, 'FTP': 21, 'DNS': 53}.

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER  
Windows PowerShell  
Copyright (C) 2009 Microsoft Corporation. All rights reserved.  
  
PS C:\Users\Techno.Home> & C:/Users/Techno.Home/AppData/Local/Programs/Python/Python38/python.exe c:/Users/Techno.Home/Desktop/1.py  
{'HTTP': 80, 'HTTPS': 443, 'FTP': 21, 'DNS': 53}  
PS C:\Users\Techno.Home>
```



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

*Answer:*

```
def fact(n):  
    if n==0:  
        return 1  
    else:  
        return n*fact(n-1)  
n=int(input("Enter a number to find it's factorial\n"))  
fact_n=fact(n)  
print(f"the factorial of {n} is: {fact_n}")
```

A screenshot of a Windows PowerShell terminal window. The title bar shows 'Python' and standard window controls. The terminal text includes: 'Windows PowerShell', 'Copyright (C) 2009 Microsoft Corporation. All rights reserved.', the command 'PS C:\Users\Techno.Home> & C:/Users/Techno.Home/AppData/Local/Programs/Python/Python38/python.exe c:/Users/Techno.Home/Desktop/1.py', the input 'Enter a number to find it's factorial', the user input '4', the output 'the factorial of 4 is: 24', and the prompt 'PS C:\Users\Techno.Home>'.

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER  
Windows PowerShell  
Copyright (C) 2009 Microsoft Corporation. All rights reserved.  
  
PS C:\Users\Techno.Home> & C:/Users/Techno.Home/AppData/Local/Programs/Python/Python38/python.exe c:/Users/Techno.Home/Desktop/1.py  
Enter a number to find it's factorial  
4  
the factorial of 4 is: 24  
PS C:\Users\Techno.Home>
```



**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.

**Answer:**

```
l = ['Network','Bio','Programming','Physics','Music']
for i in range (0,len(l)):
    if l[i].startswith('B'):
        print(l[i])
```

A screenshot of a Windows PowerShell terminal window. The title bar shows 'Python' and standard window controls. The terminal text includes: 'Windows PowerShell', 'Copyright (C) 2009 Microsoft Corporation. All rights reserved.', the command 'PS C:\Users\Techno.Home> & C:/Users/Techno.Home/AppData/Local/Programs/Python/Python38/python.exe c:/Users/Techno.Home/Desktop/1.py', and the output 'Bio'. The prompt 'PS C:\Users\Techno.Home>' is shown at the bottom.



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

**Answer:**

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

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  JUPYTER  
Windows PowerShell  
Copyright (C) 2009 Microsoft Corporation. All rights reserved.  
  
PS C:\Users\Techno.Home> & C:/Users/Techno.Home/AppData/Local/Programs/Python/Python38/python.exe c:/Users/Techno.Home/Desktop/1.py  
{0: 1, 1: 2, 2: 3, 3: 4, 4: 5, 5: 6, 6: 7, 7: 8, 8: 9, 9: 10, 10: 11}  
PS C:\Users\Techno.Home>
```



## 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.

**Answer:**

```
def B_2_D_Converter(bi_num):  
    dec_num = 0  
    for digit in bi_num:  
        if digit != '0' and digit != '1':  
            return None  
        dec_num = dec_num * 2 + int(digit)  
    return dec_num  
bi_num = input("Enter a Binary number to know it's Decimal  
equivalent\n")  
dec_num = B_2_D_Converter(bi_num)  
if dec_num is not None:  
    print(f"the decimal equivalent for '{bi_num}' is {dec_num}")  
else:  
    print("invalid input")
```

A screenshot of a Windows PowerShell terminal window. The window title is "Windows PowerShell". The text shows the user running a command to execute a Python script. The script prompts for a binary number, and the user enters "011001". The script then outputs "the decimal equivalent for '011001' is 25".

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER  
Windows PowerShell  
Copyright (C) 2009 Microsoft Corporation. All rights reserved.  
  
PS C:\Users\Techno.Home> & C:/Users/Techno.Home/AppData/Local/Programs/Python/Python38/python.exe c:/Users/Techno.Home/Desktop/1.py  
Enter a Binary number to know it's Decimal equivalent  
011001  
the decimal equivalent for '011001' is 25  
PS C:\Users\Techno.Home>
```



### 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.

**Answer:**

#### JSON File

```
{
  "Questions": [
    {
      "Question": "Q1",
      "Answer": "A1"
    },
    {
      "Question": "Q2",
      "Answer": "A2"
    }
  ]
}
```

#### Python File

```
import json
def load_questions(f_name):
    with open(f_name, 'r') as file:
        data = json.load(file)
        return data["Questions"]
def quiz(questions):
    score = 0
    total_questions = len(questions)
    for i, q in enumerate(questions, 1):
        print(f"Question {i}: {q['Question']}")
        user_answer = input("your answer: ")
        if user_answer.lower() == q['Answer'].lower():
            score += 1
    return score, total_questions
def main():
    questions =
load_questions('c:/Users/Techno.Home/Desktop/quiz.json')
    user_name = input("enter your name !\n")
    score, total_questions = quiz(questions)
```



```
result = {
    'name': user_name,
    'score': score,
    'total_questions': total_questions
}
with open('c:/Users/Techno.Home/Desktop/user_result.json', 'w') as
file:
    json.dump(result, file, indent=4)
    print(f"Finished !\nyour score is {score}/{total_questions}")
if __name__ == "__main__":
    main()
```

A screenshot of a Jupyter Notebook terminal window. The window has tabs for PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL, and JUPYTER. The TERMINAL tab is active, showing the following text: Copyright (C) 2009 Microsoft Corporation. All rights reserved. PS C:\Users\Techno.Home> & C:/Users/Techno.Home/AppData/Local/Programs/Python/Python38/python.exe c:/Users/Techno.Home/Desktop/1.py enter your name ! Mohammad Said Fadel Question 1: Q1 your answer: A1 Question 2: Q2 your answer: A1 Finished ! your score is 1/2 PS C:\Users\Techno.Home> 

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER
Copyright (C) 2009 Microsoft Corporation. All rights reserved.
PS C:\Users\Techno.Home> & C:/Users/Techno.Home/AppData/Local/Programs/Python/Python38/python.exe c:/Users/Techno.Home/Desktop/1.py
enter your name !
Mohammad Said Fadel
Question 1: Q1
your answer: A1
Question 2: Q2
your answer: A1
Finished !
your score is 1/2
PS C:\Users\Techno.Home>
```

```
C: > Users > Techno.Home > Desktop > {} user_result.json > ...
1  {
2      "name": "Mohammad Said Fadel",
3      "score": 1,
4      "total_questions": 2
5  }
```



## 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.

**Answer:**

```
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):
        self.balance += amount
        print(f"amount of deposite is: {amount}$\nyour new balance is:
{bank_account.get_balance()}$")
    def withdraw(self, amount):
        if amount <= self.balance:
            self.balance -= amount
            print(f"amount of withdrawel is: {amount}$\nyour new
balance is: {bank_account.get_balance()}$")
        else:
            print(f"!! insufficient funds !!\n your balance is
{bank_account.get_balance()}$")
    def get_balance(self):
        return self.balance
    def get_accountholder(self):
        return self.account_holder
```



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER
```

Windows PowerShell  
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```
PS C:\Users\Techno.Home> & C:/Users/Techno.Home/AppData/Local/Programs/Python/Python38/python.exe c:/Users/Techno.Home/Desktop/1.py
amount of deposite is: 1000$
your new balance is: 1000.0$
amount of withdrawel is: 500$
your new balance is: 500.0$
Dear Mohannad Issa
your current balance is: 2100.0$ with a rate of: 5.0%
PS C:\Users\Techno.Home>
```