First Network Programming Homework

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Question 1: Python Basics?

A-If you have two lists, L1=[‘HTTP’,’HTTPS’,’FTP’,’DNS’]
L2=[80,443,20,53], convert it to generate this
dictionary d={‘HTTP’:80,’HTTPS’:443,’FTP’:20,’DNS’:53 }

Answer 1.A:

Code:

```
print("A's Answer:")

L1 = ['HTTP', 'HTTPS', 'FTP', 'DNS']
L2 = [80, 443, 20, 53]

d = {}

for i in range(0, 4):
    d [L1[i]] = L2[i]

print("dict is :", d)
```

Explanation:

●Here, created an empty dictionary variable.

●Then, created a for loop for the size of lists.

●Finally, gave an item of first list (L1) as a key for the dictionary, and gave an item of the second list (L2) as a value for the dictionary.

Result:

```
A's Answer:
dict is : {'HTTP': 80, 'HTTPS': 443, 'FTP': 20, 'DNS': 53}
```

B- Generate and print a list of primary numbers from 1 to 1000.

Answer 1.B:

Code:

```
print("B's Answer:")

prime_list = []


# started loop from 2, because 1 is not a prime number
for number in range(2, 1001):

    # number checking loop (this loop is to check if the
      #number is dividable by all smaller numbers)
    for j in range(2, number+1):

        # if j reached the number we're checking, this means
       #the condition is not broken, and the number is a prime
        if j == number:
            prime_list.append(number)

        # this means the number is not prime, so we break the
       #number checking loop
        elif number % j == 0:
            break

print("prime list is :", prime_list)
```

Explanation:

●Here, created an empty list for prime numbers.

●Then, created a for loop for range(2, 1001) and that’s because 1 is not a prime number.

●Then created another for loop to check if the current number is dividable by all numbers smaller than it, if it’s dividable by another number smaller than it and that number is not 1, then number is not prime, don’t add it to list, and break the second for loop, and continue in the first for loop to check the next number.

●And if the second for loop reached the number we’re checking, then the number is prim because it’s only dividable by 1, and add it to list.

Result:

```
B's Answer:
prime list is : [2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67
```

C- L=[‘Network’ , ’Math’ , ’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 ‘Ph’ letter, then print it on screen.

Answer 1.C:

Code:

```
print("C's Answer:")

L = ['Network', 'Math', 'Programming', 'Physics', "Music"]

# for all items in the list, item here represent each string
#element in the list
for item in L:
    if item.startswith("Ph"):
        print(item)
```

Explanation:

●Here, created a for loop for the size of lists.

●Then checked all items using String function(startswith()), and printed the item that starts with “Ph”

Result:

```
C's Answer:
Physics
```

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

Answer 1.D:

Code:

```
print("D's Answer:")

d = {}

for i in range(2, 12):
    d [i-1] = i

print(d)
```

Explanation:

●Here, created an empty dictionary variable.

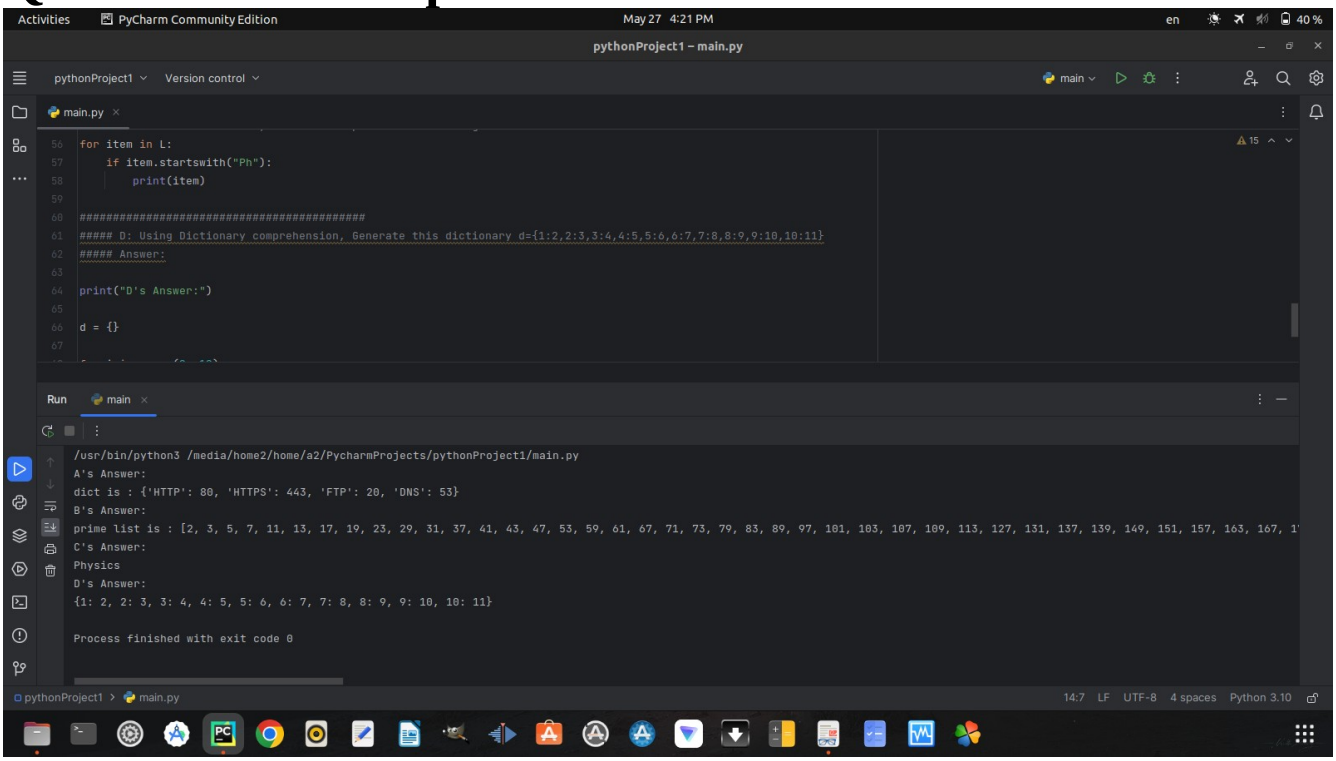
●Then, created a for loop from 2 to 12.

●Finally, gave an item of value: (i-1) as a key for the dictionary, and gave an item of value (i) as a value for the dictionary.

Result:

```
D's Answer:
{1: 2, 2: 3, 3: 4, 4: 5, 5: 6, 6: 7, 7: 8, 8: 9, 9: 10, 10: 11}
```

Question 1 full output:



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.

Answer 2:
Code:

```
while True:

    binary_number = input("Enter a binary number to convert to decimal: (Enter \'e\' to end program):")

    # this condition to check if user entered the letter "e" to exit program(break #while loop)
    if binary_number.__eq__("e"):
        break

    decimal_number = 0
    j = 1

    input_error = False

    #the loop is reversed, that's to count the decimal from right to left(smallest #binary value to biggest)
    for i in reversed(binary_number):

        # this condition is solve input error(check if user entered a non-binary #value)
        if i != "0" and i != "1":
            print("INPUT_ERROR ", "please enter a binary number")
```

```
            input_error = True
            break

        if i == "1":
            decimal_number += j

        # j increases itself for the next loop round like that: 2, 4, 8, 16, 32, 64,
         #128, 256, ........
        j *= 2

    # here the program failed because the user enter an incorrect value, so no
        #output
    if not input_error:
        print("Binary value:", binary_number)
        print("Decimal value:", decimal_number)
```

Explanation:

●Here, created a forever while loop, so the program goes on and on until the user enter ‘e’ to end it.

●First if is to check if user entered ‘e’ to end the program.

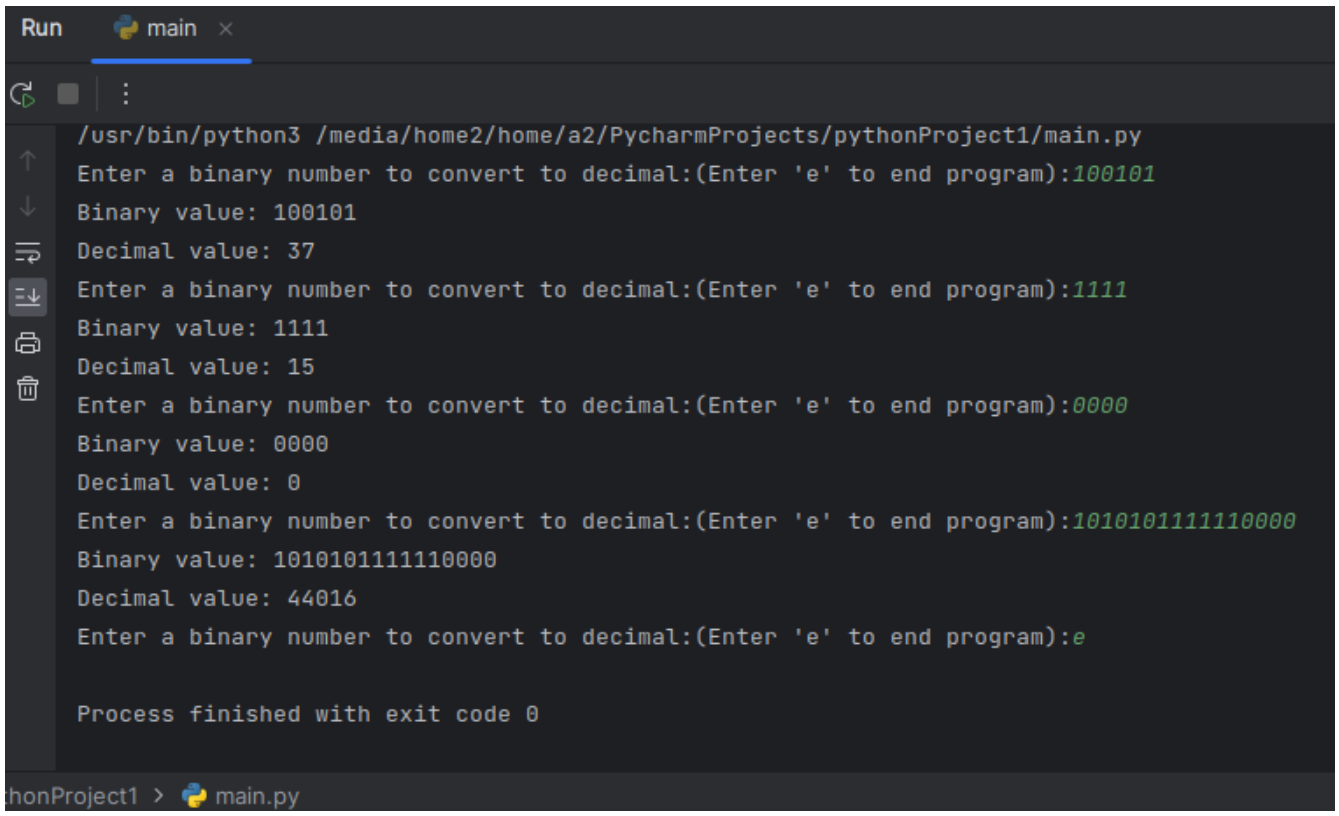
●Then there’s a for loop for the entered binary number, and it’s reversed, because we read a binary number from right(smallest) to left(biggest).

●Then we check the entered value to ensure it’s a binary(0 or 1), and if it’s not a binary value the program ends, if it’s a binary value the program calculates the equivalent decimal value like this:

decimal_number = (i0*j0) + (i2*j2) + ……. + (in*jn)

●Finally the program outputs the values.

Result:


Run
main
/usr/bin/python3 /media/home2/home/a2/PycharmProjects/pythonProject1/main.py
Enter a binary number to convert to decimal:(Enter 'e' to end program):100101
Binary value: 100101
Decimal value: 37
Enter a binary number to convert to decimal:(Enter 'e' to end program):1111
Binary value: 1111
Decimal value: 15
Enter a binary number to convert to decimal:(Enter 'e' to end program):0000
Binary value: 0000
Decimal value: 0
Enter a binary number to convert to decimal:(Enter 'e' to end program):1010101111110000
Binary value: 1010101111110000
Decimal value: 44016
Enter a binary number to convert to decimal:(Enter 'e' to end program):e
Process finished with exit code 0
honProject1 > main.py

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 3:

Code:

```
import json

#Result variable to store user's name, answers and final
      #mark
results = {}
final_mark = 0

#Opening the json file
file = open("quiz.json")
quiz = json.load(file)

#Entering student name
user_name = input("Enter your name: ")
#First value is user's name
results ["Name"] = user_name

#There's only two values a user can enter: t for true, f for
      #false
print("Answer \"t\" for True and \"f\" for False")

j = 1
```

```
#For loop for items in json file(quiz)
for item in quiz:

    #Answer enter by user
  answer = input(item)
    #Correct answer from json file, which is first element of
    #list
  correct_answer = quiz[item][0]

    #If user entered a value that's not t or f, show a warning
  if not answer.__eq__("t") and not answer.__eq__("f"):
     print("please answer with \"t\" for True, and \"f\" for
False")
     answer = input(item)

    #If user answered correctly, increase the mark
  if answer.__eq__(correct_answer):
     print("Correct")
     final_mark += 5
     answer = "correct"

    #If user answered incorrectly, don't change the mark,
    #and output the right answer
  else:
     if correct_answer.__eq__("f"):
        print("Wrong, correct answer is: ", quiz[item][1])
     elif correct_answer.__eq__("t"):
        print("Wrong, correct answer is true")

     answer = "Wrong"

    #Add that user answer correctly or incorrectly to
    #question X in results
  results["Question"+str(j)] = answer
  j += 1
```

```
results["Result"] = final_mark

print("Thanks for taking the test, your result is: ",
str(final_mark)+"/100")

# write results variable to a json file
with open("results.json", "w") as write_file:
    json.dump(results, write_file)

json_string = json.dumps(results)
```

Explanation:

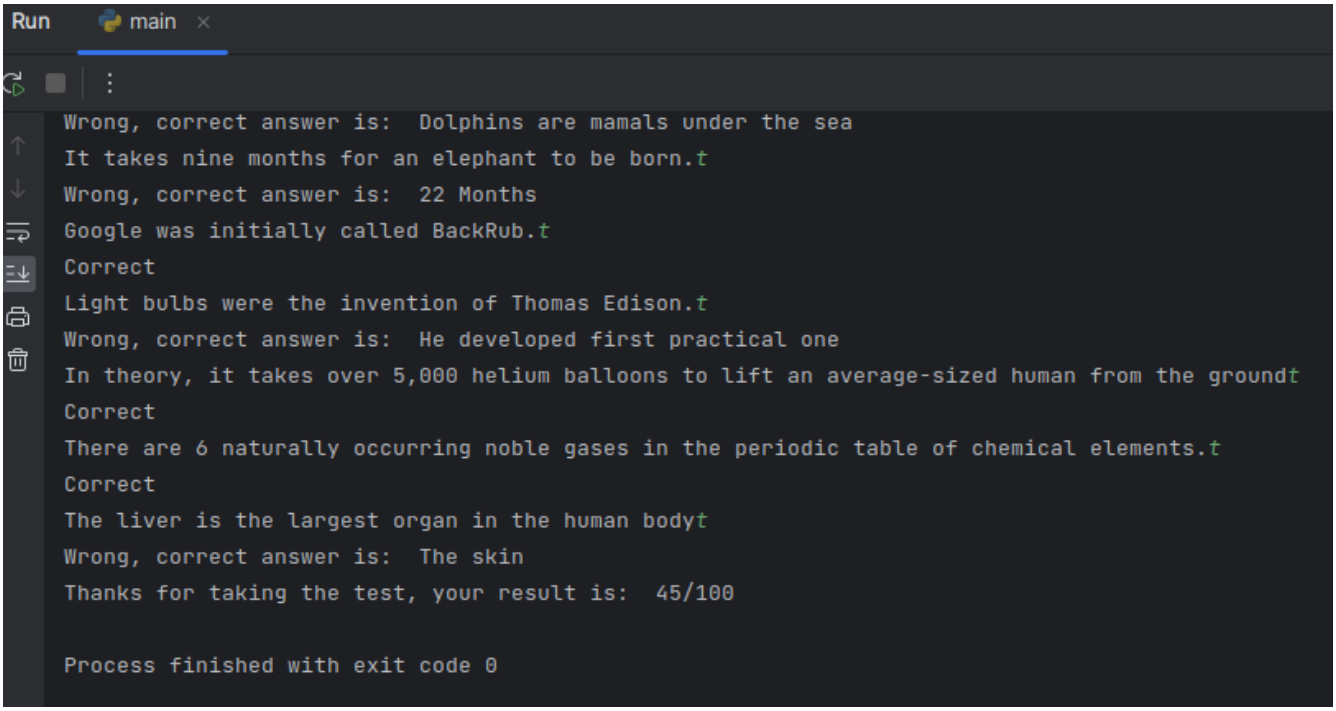
●Here, created a json file with 20 true or false questions, true questions have a list of one item which is “t” for True, false questions have a list of two items, first one is “f” for false, and second item is the correct answer.

●First, opened json file, then created an empty result variable which will contain: “username, questions and users answer, final mark”

●Then, created for loop for items in json file, and for each item there’s an input for the user, then a check if user entered a value that’s not “t” or “f”, then another check for user’s answer, if it’s correct increase mark by 5, if it’s wrong don’t change the mark, and output the correct answer.

●Finally, output user’s mark, and write results variable to a new json file.

Result:


Run
main
Wrong, correct answer is: Dolphins are mamals under the sea
It takes nine months for an elephant to be born.t
Wrong, correct answer is: 22 Months
Google was initially called BackRub.t
Correct
Light bulbs were the invention of Thomas Edison.t
Wrong, correct answer is: He developed first practical one
In theory, it takes over 5,000 helium balloons to lift an average-sized human from the groundt
Correct
There are 6 naturally occurring noble gases in the periodic table of chemical elements.t
Correct
The liver is the largest organ in the human bodyt
Wrong, correct answer is: The skin
Thanks for taking the test, your result is: 45/100
Process finished with exit code 0