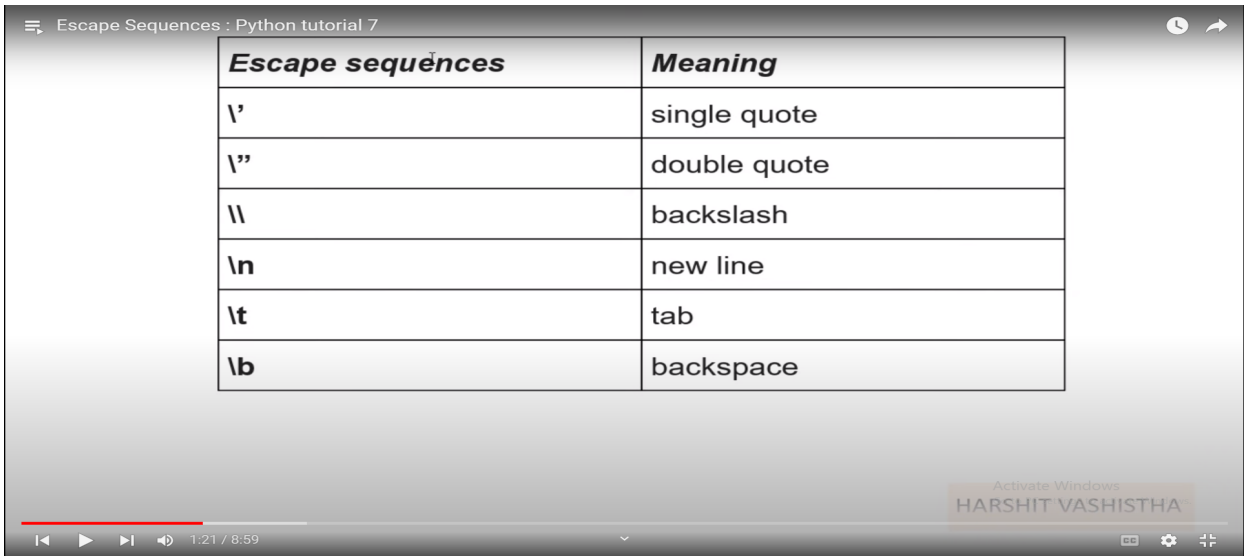


https://www.youtube.com/channel/UCdoHYNcVRdqNaH5ifupXFMQ/videos

OPPE 1 - RAM

1)

You have n gold coins with you. You wish to divide this among three of your friends under the following conditions:

(1) All three of them should get a non-zero share.

(2) No two of them should get the same number of coins.

(3) You should not have any coins with you at the end of this sharing process.

The input has four lines. The first line contains the number of coins with you. The next three lines will have the share given to your three friends. All inputs shall be non-negative integers. If the division satisfies these conditions, then print the string `FAIR`. If not, print `UNFAIR`.

2)

Given a matrix M, your task is to create a new matrix by inserting a column of ones before the first column of M. For example, this is the required transformation:

$$\begin{bmatrix}1 & 2 & 3\\4 & 5 & 6\end{bmatrix} \rightarrow \begin{bmatrix}1 & 1 & 2 & 3\\1 & 4 & 5 & 6\end{bmatrix}$$

Write a function named `add_ones` that accepts a matrix M as argument and returns a new matrix by inserting a column of ones before the first column of M.

---

(1) The matrix need not be square.

(2) You do not have to accept input from the user or print output to the console. You just have to write the function definition.

Logic: How to frame the algorithm??
Need some reference??

3)

A number is called a **double palindrome** if both the number and its square are palindromes. For example, 11 is a double palindrome as both 11 and 121 are palindromes. Accept a positive integer n as input and print all the double palindromes less than or equal to n in ascending order.

4)

A string `str_1` is a substring of another string `str_2`, if `str_1` is present as a sequence of consecutive characters in `str_2`. For example, `got` is a substring of `gottingen`, whereas `got` is *not* a substring of `goat`.

Accept a sequence of comma separated words as input. Print that **word** in the sequence which is a substring of every other word in the sequence.

If you do not find any word that is a common substring of all words in the sequence, print `None`. Assume that all the words will be in lower case. You can also assume that the sequence will have at least two words.

Note: By the term word, we mean a single element in the sequence, and not a substring of one of the elements. For example, in the third test case, the substring `'al'` is present in every word of the sequence. But `'al'` by itself is not a word (element) in the sequence. Hence, the answer for this test case is None.

Feb 2022 | OPPE

1)

`L` is a list of runs scored by a batsman in cricket matches in his career. Each entry corresponds to the batsman's score in a match. A score is termed a century if it is greater than or equal to 100. A streak is a sequence of consecutive centuries. For example, in the list

```
L = [150, 20, 0, 100, 120, 201, 50, 101, 141, 40, 20]
```

There are three streaks with lengths 3, 2 and 1.

Write a function named **`longest_streak`** that accepts a list `L` of non-negative integers as argument. It should return the length of the longest streak in the list. You can assume that `L` will have at least one element that is greater than or equal to 100. So, the value you return should be greater than or equal to 1.

You do not have to accept input from the user or print the output to the console. You just have to write the function definition.

2)

We shall define the distance between two points $P_1 = (x_1, y_1)$ and $P_2 = (x_2, y_2)$ in 2-D space as follows:

$$D(P_1, P_2) = |x_1 - x_2| + |y_1 - y_2|$$

where, $|a - b|$ is the absolute value of the difference between two numbers a and b.

Write a function named `equidistant` that accepts a list of `points`, a point `P` and a positive integer `d` as arguments. It should return the number of points in the list `points` that are at a distance `d` from the point `P`.

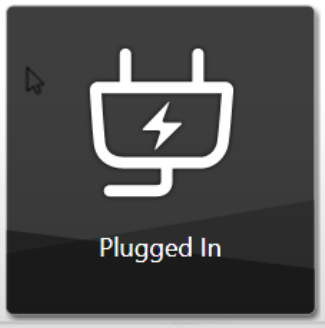
Each point is represented as a tuple – `(x, y)`. The list `points` is a list of tuples.

You do not have to accept input from the user or print output to the console. You just have to write the function definition.

3)

You are given a book that has n pages. The pages of the book are numbered from 1 to n. Each page of the book has a page-number written at the bottom of the page. Find the number of times each digit appears in the page-numbers of the book. For example, if the book has 15 pages, this is the number of times each digit appears:

```
{
    0: 1,
    1: 8,
    2: 2,
    3: 2,
    4: 2,
    5: 2,
    6: 1,
    7: 1,
    8: 1,
    9: 1
}
```



Write a function named `digit_count` that accepts the number of pages as argument. It should return a dictionary `D` that has the following structure. The keys of this dictionary are digits, the values are the frequencies of occurrence of the corresponding digits.

You do not have to accept input from the user or print output to the console. You just have to write the function definition.

OPPE 2

1)

Write a function named `primes_galore` that accepts a list `L` of non-negative integers as argument and returns the number of primes that are located at prime indices in `L`. Zero-indexing is used throughout this problem.

For example:

```
L = [1, 3, 11, 18, 17, 23, 6, 8, 10]
```

The prime indices in the list are $2, 3, 5, 7$. Of these, there are prime numbers at the indices 2 and 5. Therefore, the function should return the value 2 in this case.

You do not have to accept input from the user or print the output to the console. You just have to write the function definition.

2)

You are given a CSV file that contains the marks of students in various subjects. The first line of the file is the header. The first column of the file holds the names of students. All other columns correspond to some subject. Sample file:

```
Name,CompSci,Architecture,Physics
Ram,80,74,85
Nitin,94,44,98
Mayur,45,40,88
Usha,63,36,56
Keerthi,72,59,69
Fatima,56,52,48
```

Your task is to read the file and store the details as a list of dictionaries. Each element in the list corresponds to one row of the file. If the file has n lines, the list should have $n - 1$ elements. For example, the first entry in the list corresponds to the second row in the file:

```
{
    "Architecture": 74,
    "CompSci": 80,
    "Name": "Ram",
    "Physics": 85
}
```

The elements should be appended to the list in the order in which they appear in the file.

Write a function named `file_to_list` that accepts the filename as argument. It should return the list in the format given above.

---

(1) You do not have to accept input from the user or print the output to the console. You just have to write the function definition.

(2) The number of columns will keep varying across test cases. The first column of each file is guaranteed to be "Name".

(3) Make sure that the subject marks is of type `int`.

3)

Write a function named **`mat_product`** that accepts five square matrices – A, B, C, D and E – as input arguments. It should return the product of these five matrices:

$$A \times B \times C \times D \times E$$

Note that the order of multiplication matters!

(1) You can assume that the dimensions of all five square matrices will be the same. You can write any additional functions required to solve the problem.

(2) You do not have to accept input from the user or print the output to the console. You just have to write the function definition.

4)

Write a function named **`mat_sum`** that accepts three matrices – **`A`**, **`B`** and **`C`** – as arguments. If the dimensions of all three matrices are not the same, it should return -1. If the dimensions match, `mat_sum` should return the sum of the three matrices: **`A + B + C`**

You do not have to accept input from the user or print the output to the console. You just have to write the function definition.

From python group

You will be able to resubmit before due date.

Due: 27 Nov 2022 09:30 IST
Time Left: 01:44:33

The `scores_dataset` is a list of dictionaries one of whose entries is given below for your reference:

```
{'SeqNo': 1, 'Name': 'Devika', 'Gender': 'F', 'City': 'Bengaluru',
 'Mathematics': 85, 'Physics': 100, 'Chemistry': 79, 'Biology': 75,
 'Computer Science': 88, 'History': 60, 'Civics': 88, 'Philosophy': 95}
```

A student X can mentor another student Y in `subject` if the following condition is satisfied:

$$10 \leq X.\text{subject} - Y.\text{subject} \leq 20$$

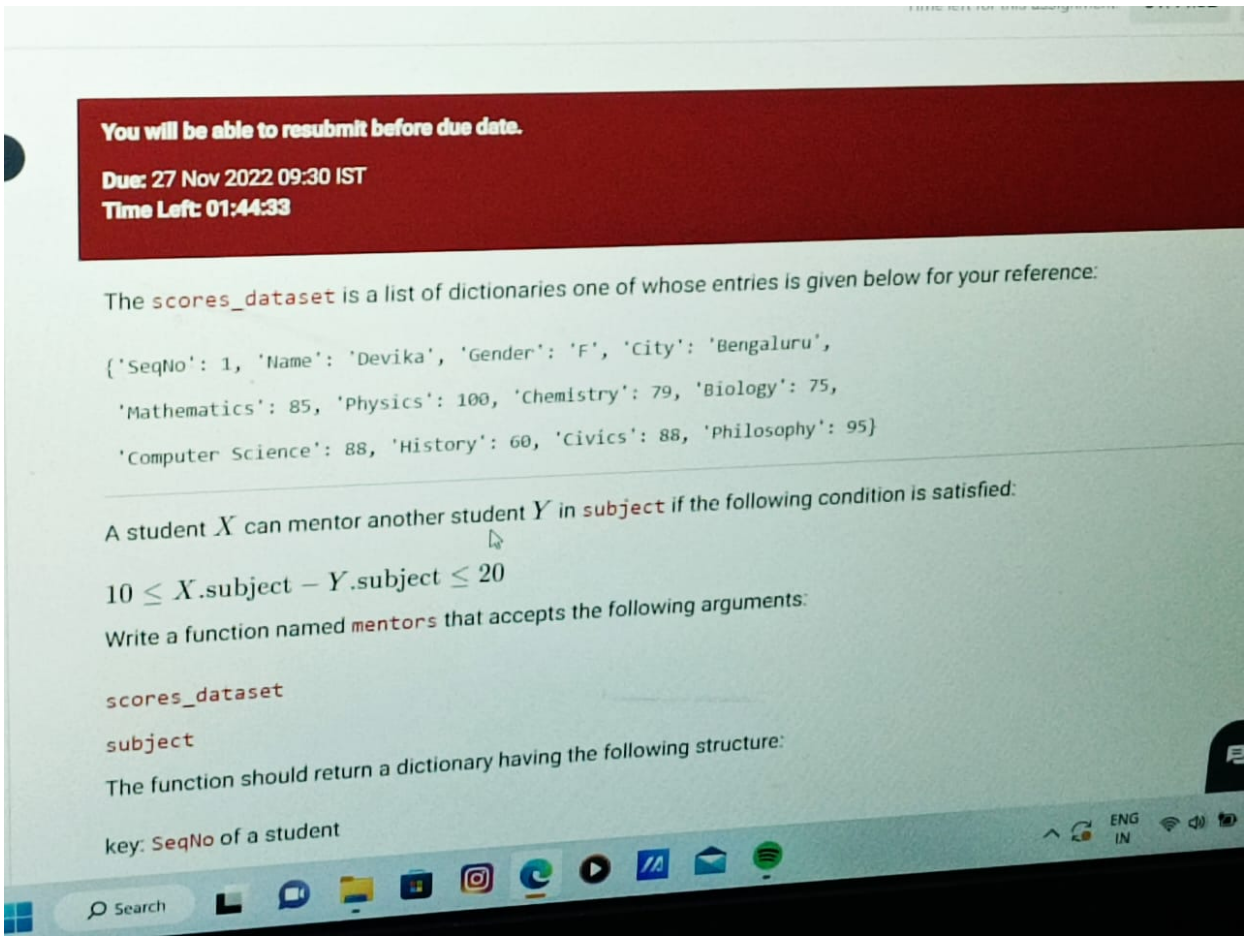
Write a function named `mentors` that accepts the following arguments:

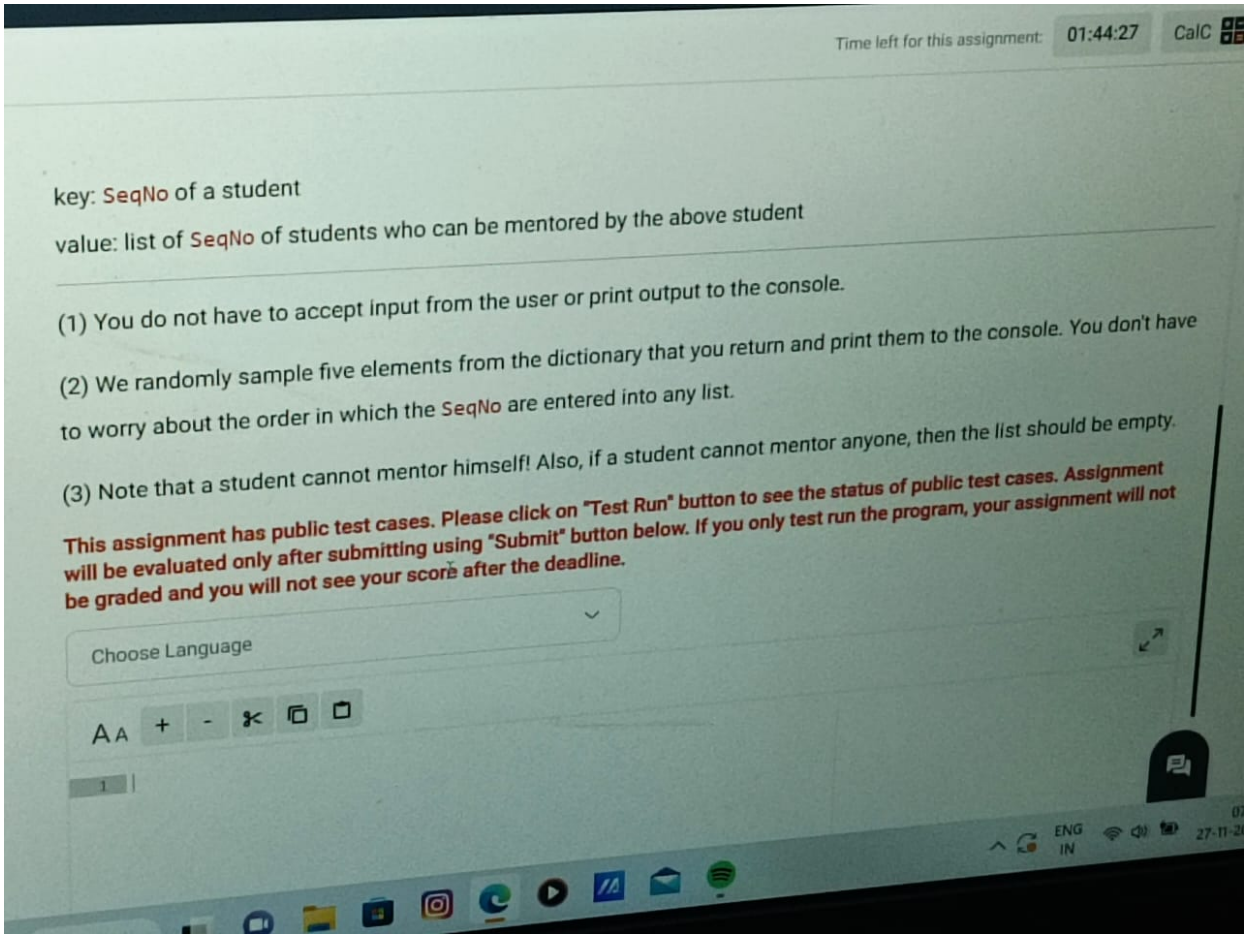
`scores_dataset`

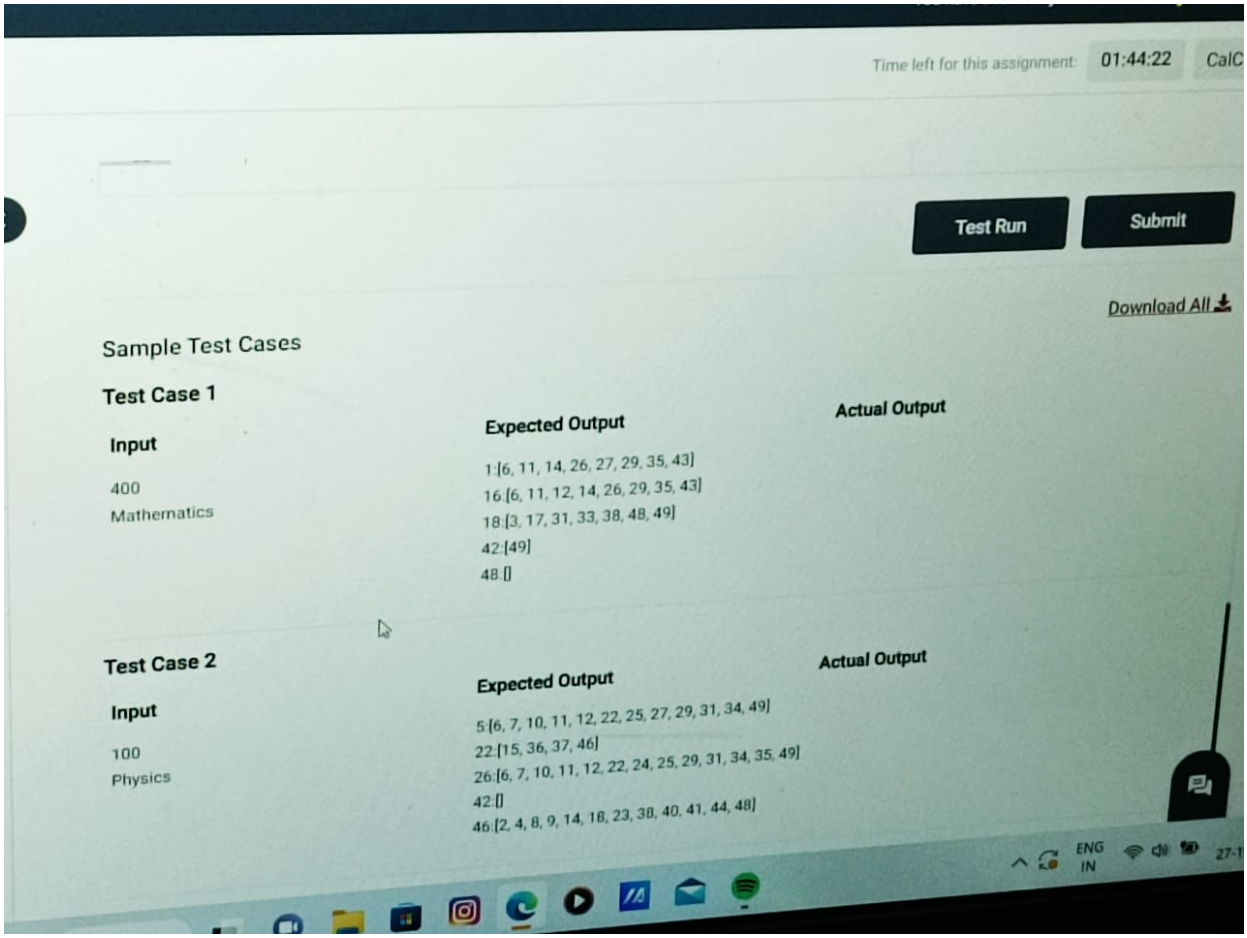
`subject`

The function should return a dictionary having the following structure:

key: `SeqNo` of a student




Time left for this assignment: 01:44:27
CalC
key: SeqNo of a student
value: list of SeqNo of students who can be mentored by the above student
(1) You do not have to accept input from the user or print output to the console.
(2) We randomly sample five elements from the dictionary that you return and print them to the console. You don't have to worry about the order in which the SeqNo are entered into any list.
(3) Note that a student cannot mentor himself! Also, if a student cannot mentor anyone, then the list should be empty.
This assignment has public test cases. Please click on "Test Run" button to see the status of public test cases. Assignment will be evaluated only after submitting using "Submit" button below. If you only test run the program, your assignment will not be graded and you will not see your score after the deadline.
Choose Language
AA
1
ENG
IN


Time left for this assignment: 01:44:22
Test Run
Submit
Download All
Sample Test Cases
Test Case 1
Input
400
Mathematics
Expected Output
1:[6, 11, 14, 26, 27, 29, 35, 43]
16:[6, 11, 12, 14, 26, 29, 35, 43]
18:[3, 17, 31, 33, 38, 48, 49]
42:[49]
48:[]
Actual Output
Test Case 2
Input
100
Physics
Expected Output
5:[6, 7, 10, 11, 12, 22, 25, 27, 29, 31, 34, 49]
22:[15, 36, 37, 46]
26:[6, 7, 10, 11, 12, 22, 24, 25, 29, 31, 34, 35, 49]
42:[]
46:[2, 4, 8, 9, 14, 18, 23, 38, 40, 41, 44, 48]
Actual Output
ENG
IN

then the list should be empty.

```
def mentors(scores, subject):
    # Get the scores and seq-no of all students in this subject
    L = [ ]
    for S in scores:
        L.append((S['SeqNo'], S[subject]))
    D = dict()
    for i in range(len(L)):
        # L[i][0] is the sequence number
        D[L[i][0]] = [ ]
        for j in range(len(L)):
            if i == j:
```

```
                continue
            # Check if i can mentor j
            if10<= L[i][1] - L[j][1] <= 20:
                D[L[i][0]].append(L[j][0])
    return D
```

2.

A phone number belonging to a specific operator is valid if it satisfies all the following conditions:

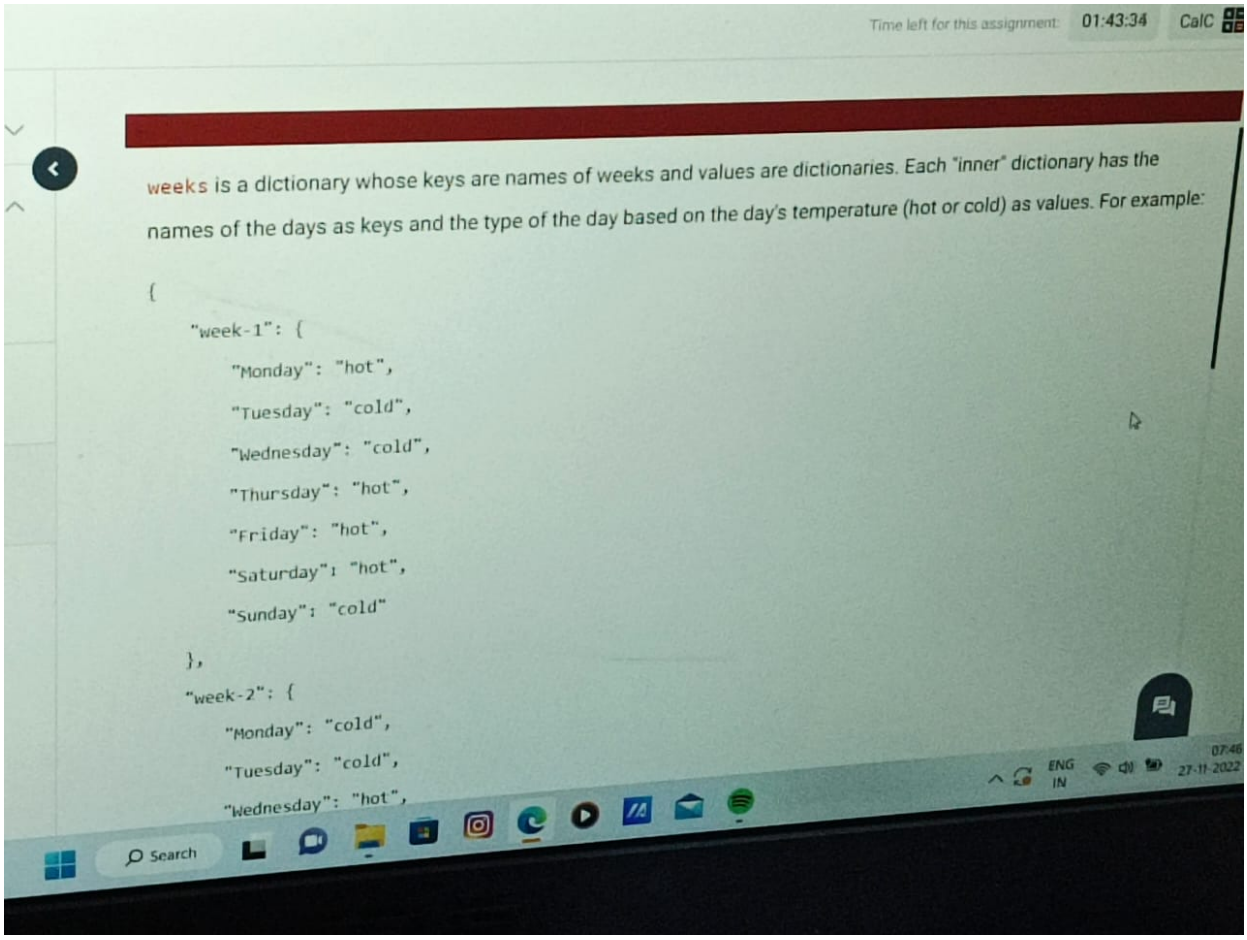
(1) It should have 10 digits

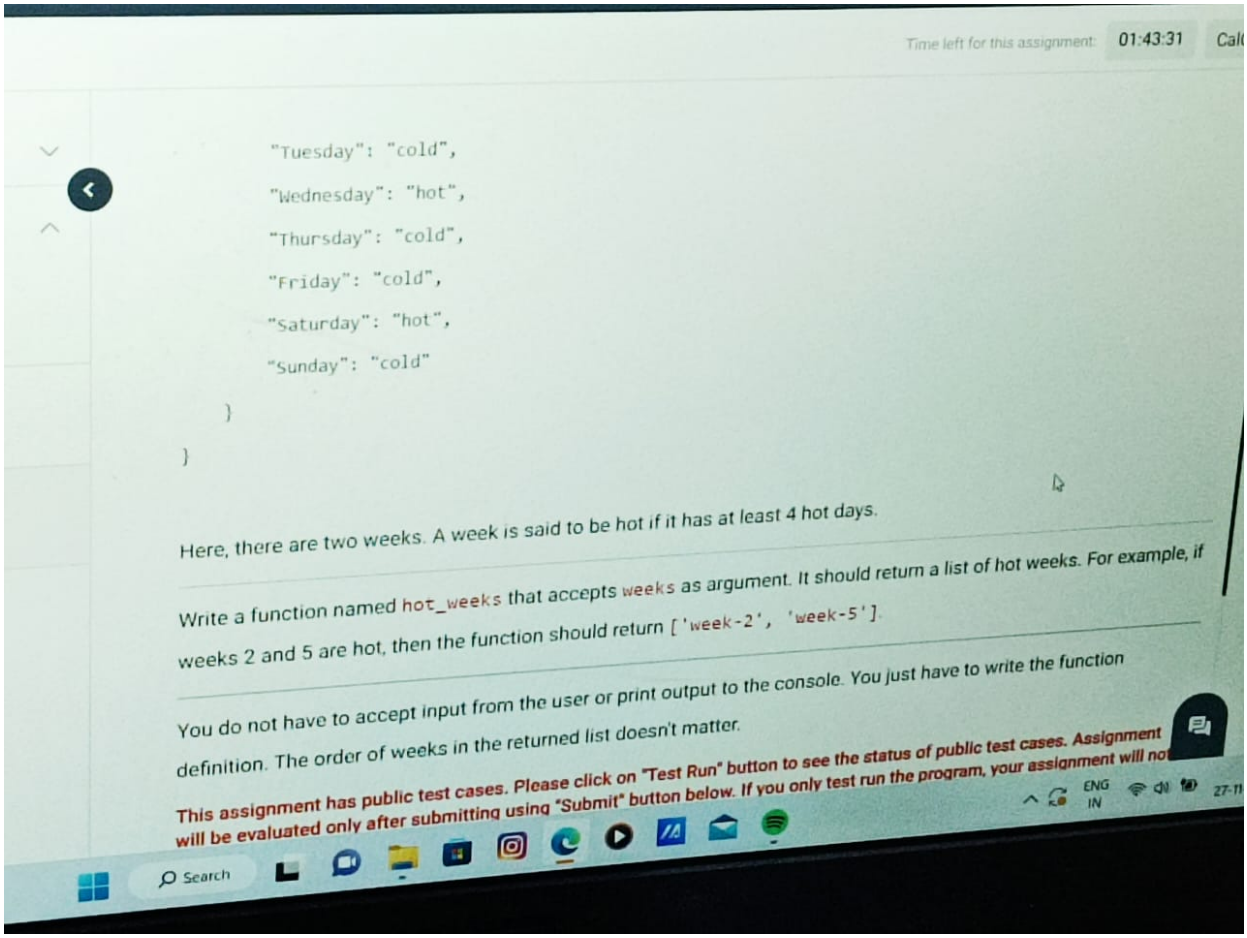
(2) It should begin with `98123`

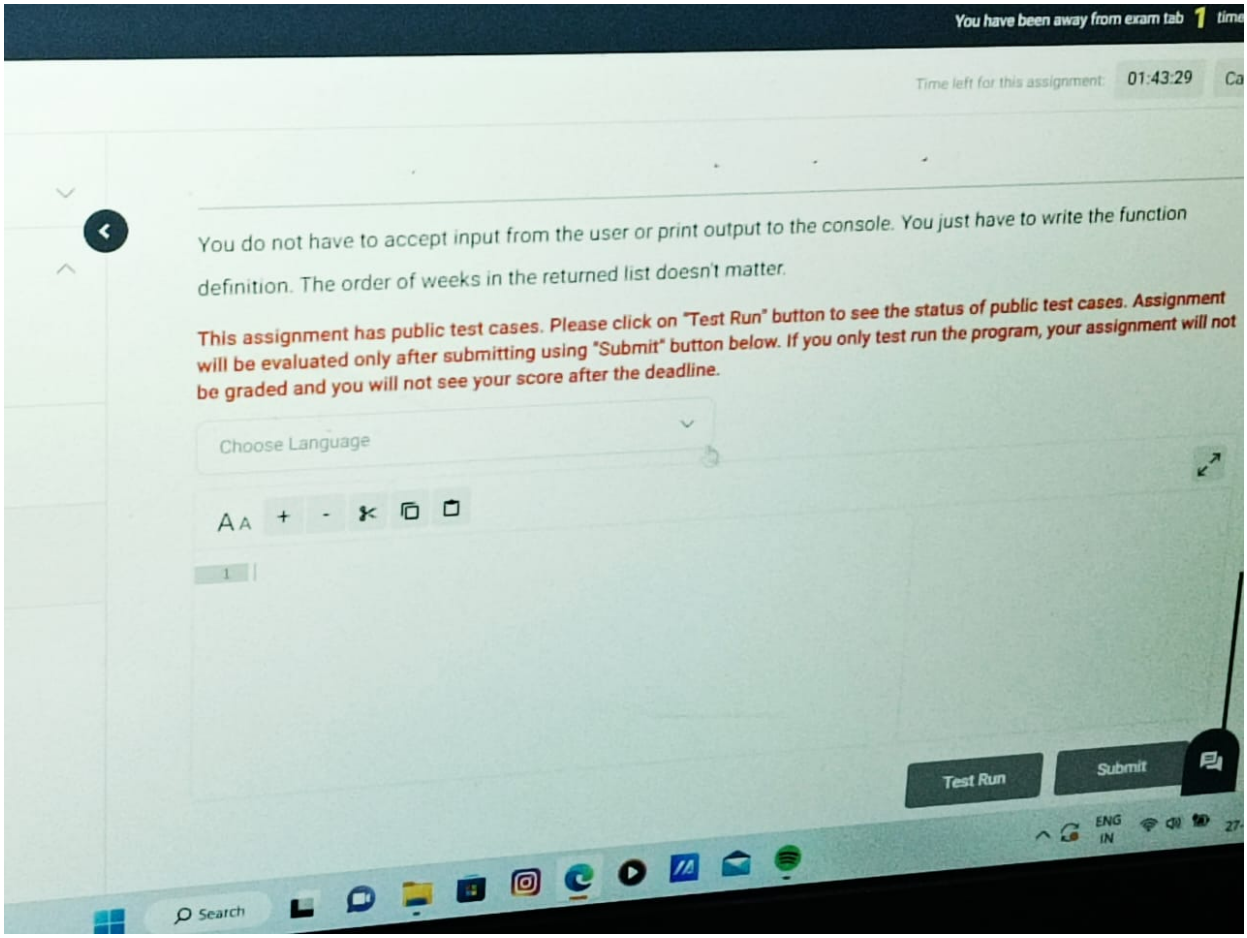
(3) A digit can occur at most five times

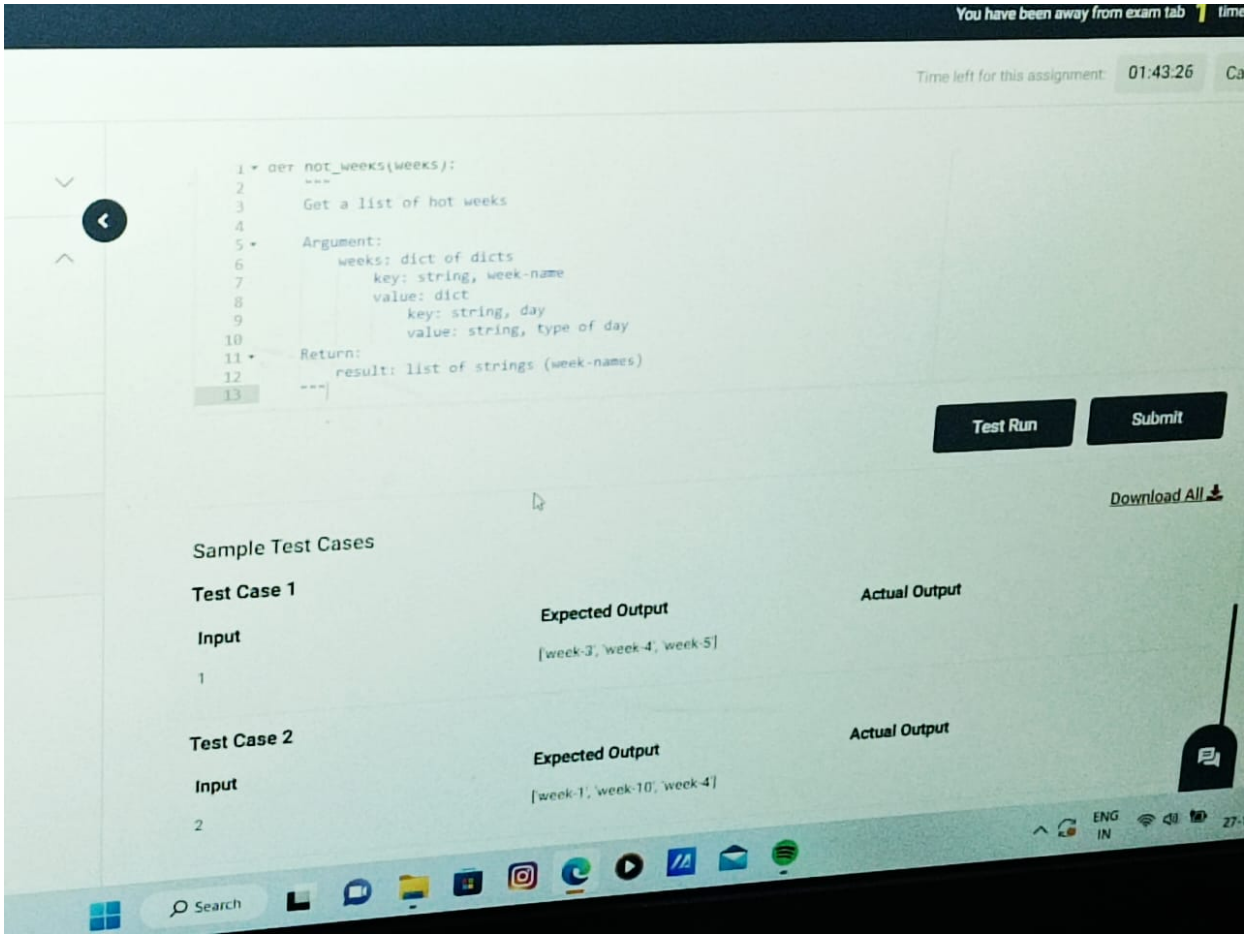
Keep accepting a phone number as input on each line. The last line of the input stream will have the word `STOP`. Create a dictionary named `D`. The keys should be the phone numbers. If a phone number is valid, then the value corresponding to it should be `VALID`, if not, the value should be `INVALID`. Print the dictionary as output. The keys and values of the dictionary should be of type `str`. The keys should be added to the dictionary in the order in which they appear in the test-case area.

3.

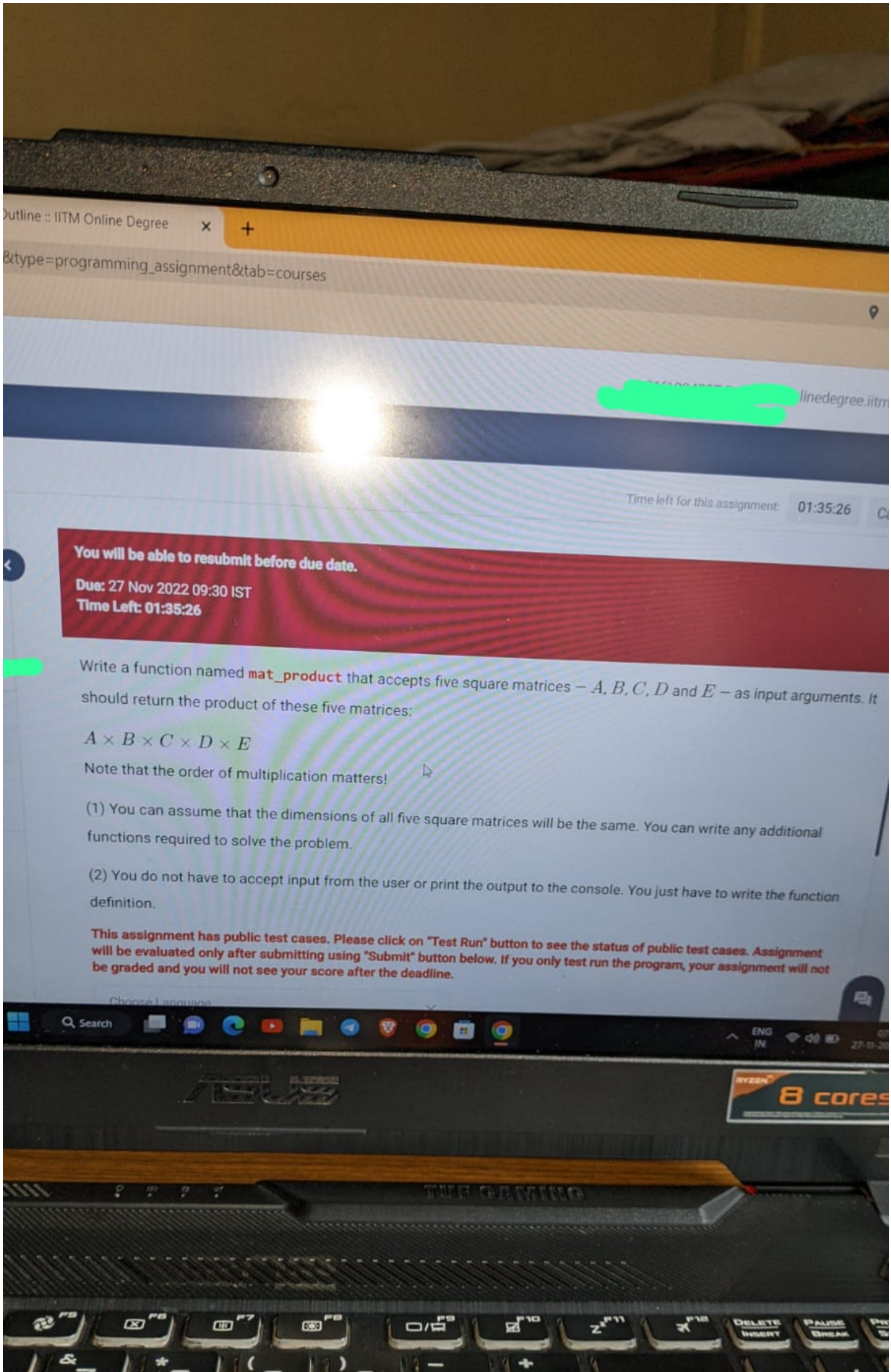

Time left for this assignment: 01:43:34
CalC
weeks is a dictionary whose keys are names of weeks and values are dictionaries. Each "inner" dictionary has the names of the days as keys and the type of the day based on the day's temperature (hot or cold) as values. For example:
{
"week-1": {
"Monday": "hot",
"Tuesday": "cold",
"Wednesday": "cold",
"Thursday": "hot",
"Friday": "hot",
"Saturday": "hot",
"Sunday": "cold"
},
"week-2": {
"Monday": "cold",
"Tuesday": "cold",
"Wednesday": "hot",
Search
ENG
IN
27-11-2022


Time left for this assignment: 01:43:31
"Tuesday": "cold",
"Wednesday": "hot",
"Thursday": "cold",
"Friday": "cold",
"Saturday": "hot",
"Sunday": "cold"
}
}
Here, there are two weeks. A week is said to be hot if it has at least 4 hot days.
Write a function named hot_weeks that accepts weeks as argument. It should return a list of hot weeks. For example, if weeks 2 and 5 are hot, then the function should return ['week-2', 'week-5'].
You do not have to accept input from the user or print output to the console. You just have to write the function definition. The order of weeks in the returned list doesn't matter.
This assignment has public test cases. Please click on "Test Run" button to see the status of public test cases. Assignment will be evaluated only after submitting using "Submit" button below. If you only test run the program, your assignment will not
Search
ENG
IN


You have been away from exam tab 1 time
Time left for this assignment: 01:43:29
You do not have to accept input from the user or print output to the console. You just have to write the function definition. The order of weeks in the returned list doesn't matter.
This assignment has public test cases. Please click on "Test Run" button to see the status of public test cases. Assignment will be evaluated only after submitting using "Submit" button below. If you only test run the program, your assignment will not be graded and you will not see your score after the deadline.
Choose Language
Test Run
Submit
Search
ENG
IN


You have been away from exam tab
Time left for this assignment: 01:43:26
def hot_weeks(weeks):
"""
Get a list of hot weeks
Argument:
weeks: dict of dicts
key: string, week-name
value: dict
key: string, day
value: string, type of day
Return:
result: list of strings (week-names)
"""
Test Run
Submit
Download All
Sample Test Cases
Test Case 1
Input
1
Expected Output
['week-3', 'week-4', 'week-5']
Actual Output
Test Case 2
Input
2
Expected Output
['week-1', 'week-10', 'week-4']
Actual Output
Search
ENG
IN

4.


Outline :: IITM Online Degree
&type=programming_assignment&tab=courses
linedegree.iitm
Time left for this assignment: 01:35:26
You will be able to resubmit before due date.
Due: 27 Nov 2022 09:30 IST
Time Left: 01:35:26
Write a function named mat_product that accepts five square matrices – A, B, C, D and E – as input arguments. It should return the product of these five matrices:
$A \times B \times C \times D \times E$
Note that the order of multiplication matters!
(1) You can assume that the dimensions of all five square matrices will be the same. You can write any additional functions required to solve the problem.
(2) You do not have to accept input from the user or print the output to the console. You just have to write the function definition.
This assignment has public test cases. Please click on "Test Run" button to see the status of public test cases. Assignment will be evaluated only after submitting using "Submit" button below. If you only test run the program, your assignment will not be graded and you will not see your score after the deadline.
Search
ENG
IN
8 cores

(1) You do not have to accept input from the user or print the output to the console. You just have to write the function definition.

(2) The number of columns will keep varying across test cases. The first column of each file is guaranteed to be "Name".

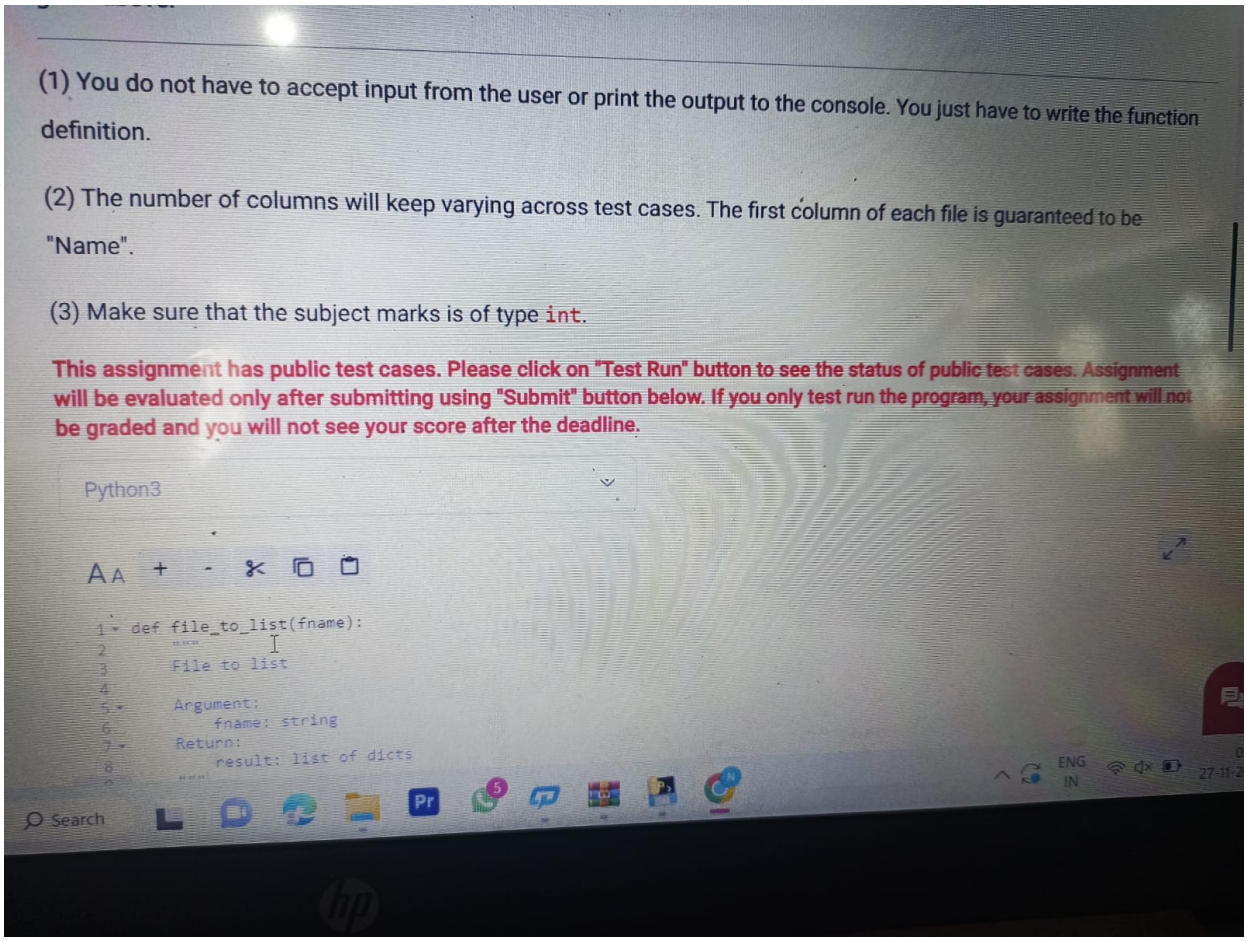
(3) Make sure that the subject marks is of type `int`.

This assignment has public test cases. Please click on "Test Run" button to see the status of public test cases. Assignment will be evaluated only after submitting using "Submit" button below. If you only test run the program, your assignment will not be graded and you will not see your score after the deadline.

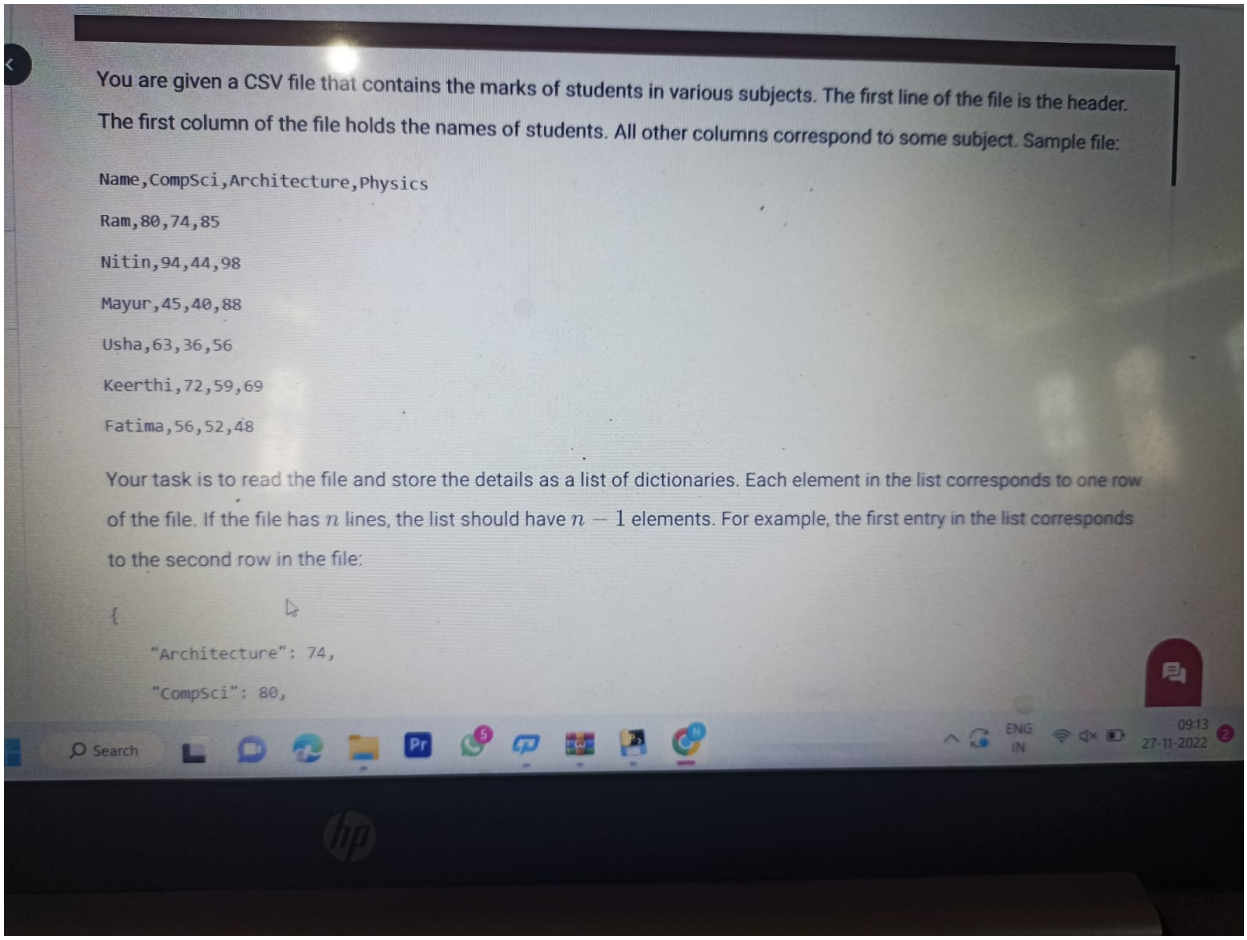
Python3

```
def file_to_list(fname):
    """
    File to list

    Argument:
        fname: string
    Return:
        result: list of dicts
    """
```



5.



You are given a CSV file that contains the marks of students in various subjects. The first line of the file is the header. The first column of the file holds the names of students. All other columns correspond to some subject. Sample file:

```
Name,CompSci,Architecture,Physics
Ram,80,74,85
Nitin,94,44,98
Mayur,45,40,88
Usha,63,36,56
Keerthi,72,59,69
Fatima,56,52,48
```

Your task is to read the file and store the details as a list of dictionaries. Each element in the list corresponds to one row of the file. If the file has n lines, the list should have $n - 1$ elements. For example, the first entry in the list corresponds to the second row in the file:

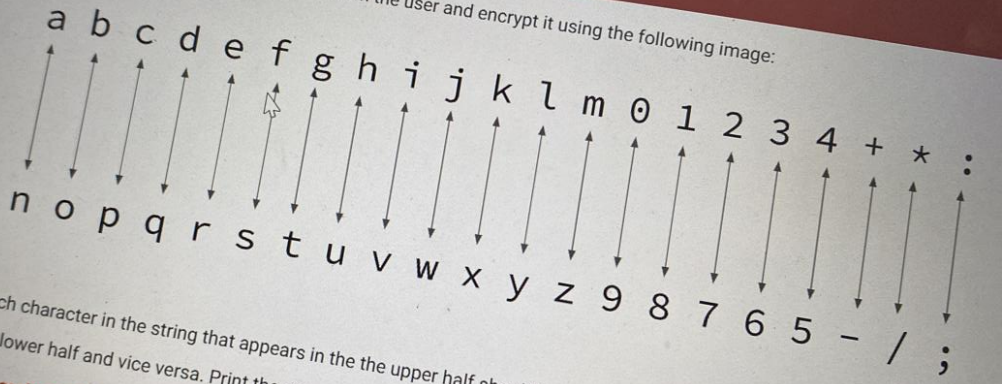
```
{
    "Architecture": 74,
    "CompSci": 80,
```

PM

Due: 27 Nov 2022 12:00 IST
Time Left: 01:40:38

Time left for this assignment: 01:40:38

Accept a string of lowercase letters from the user and encrypt it using the following image:



Each character in the string that appears in the the upper half should be replaced with the corresponding character in the lower half and vice versa. Print the encrypted string as output.

This assignment has public test cases. Please click on "Test Run" button to see the status of public test cases. Assignment will be evaluated only after submitting using "Submit" button below. If you only test run the program, your

---

`courses` is a dictionary that contains the details of the number of students who are doing a particular course. For example:

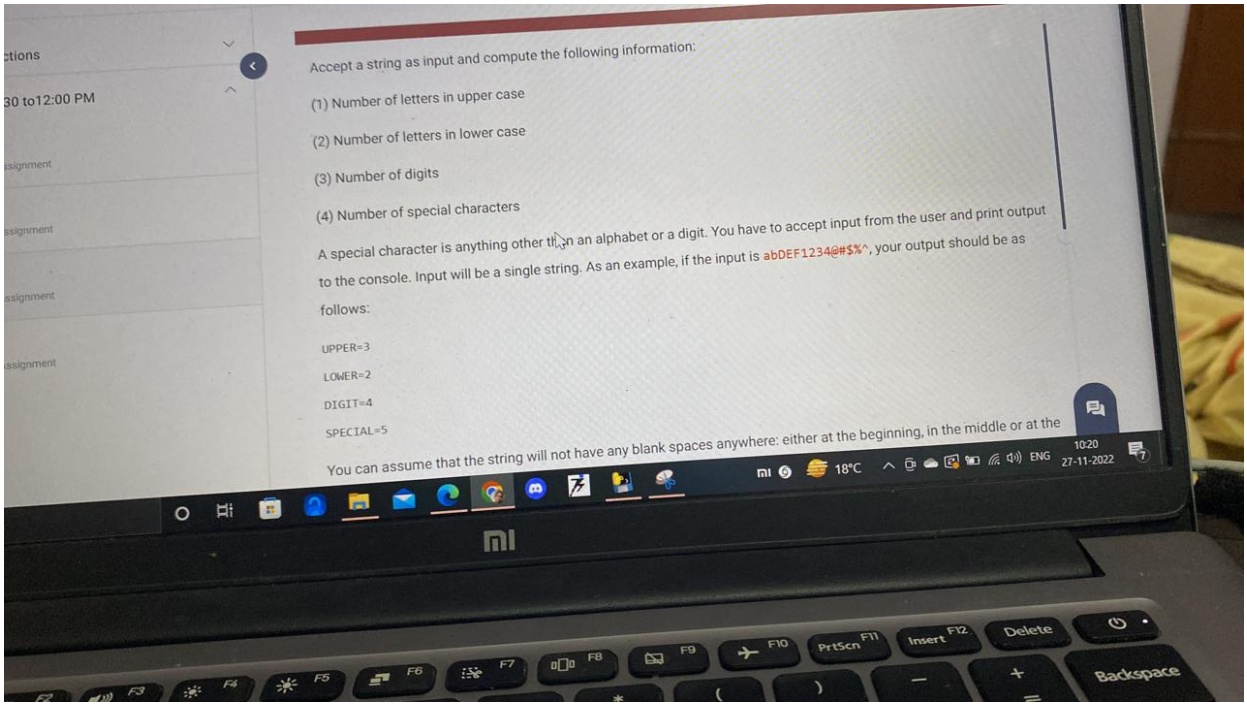
```
courses = {
    'math': 3,
    'physics': 5,
    'cs': 5,
    'history': 1
}
```

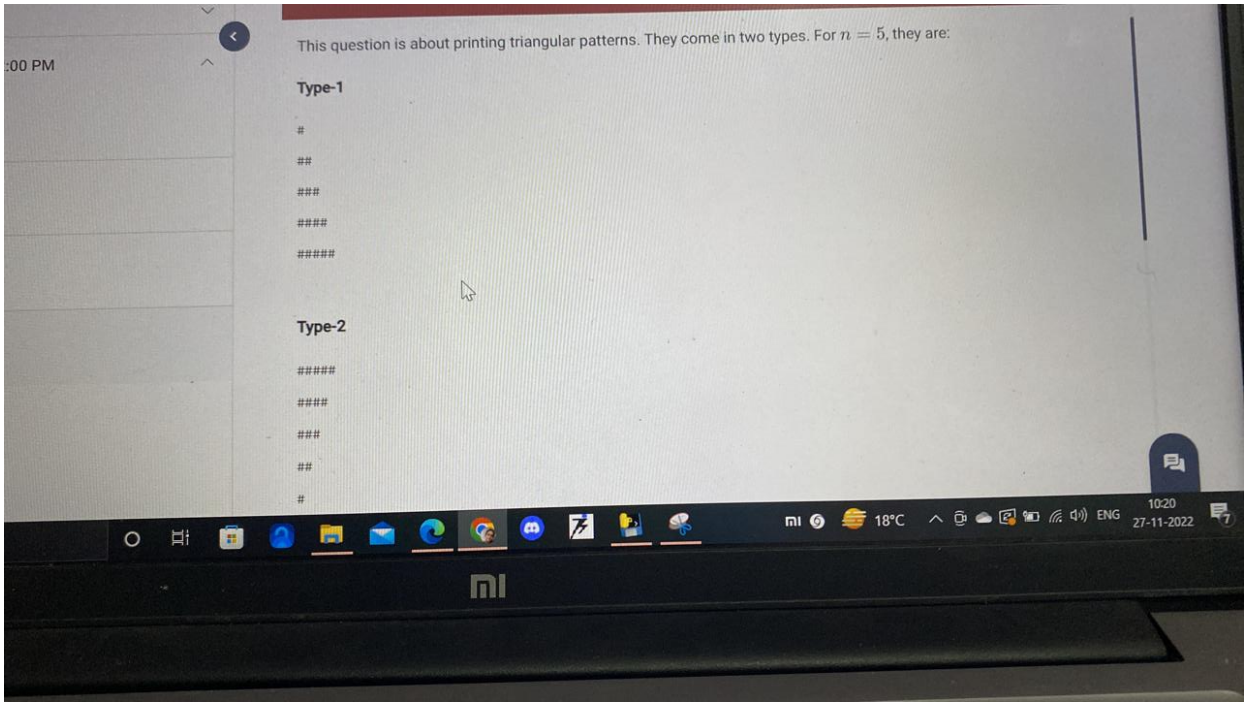
Write a function named `popular` that accepts `courses` as argument and returns the list of courses that is done by the most number of students. For the list given above, `popular(courses)` should return the list `['cs', 'physics']`.

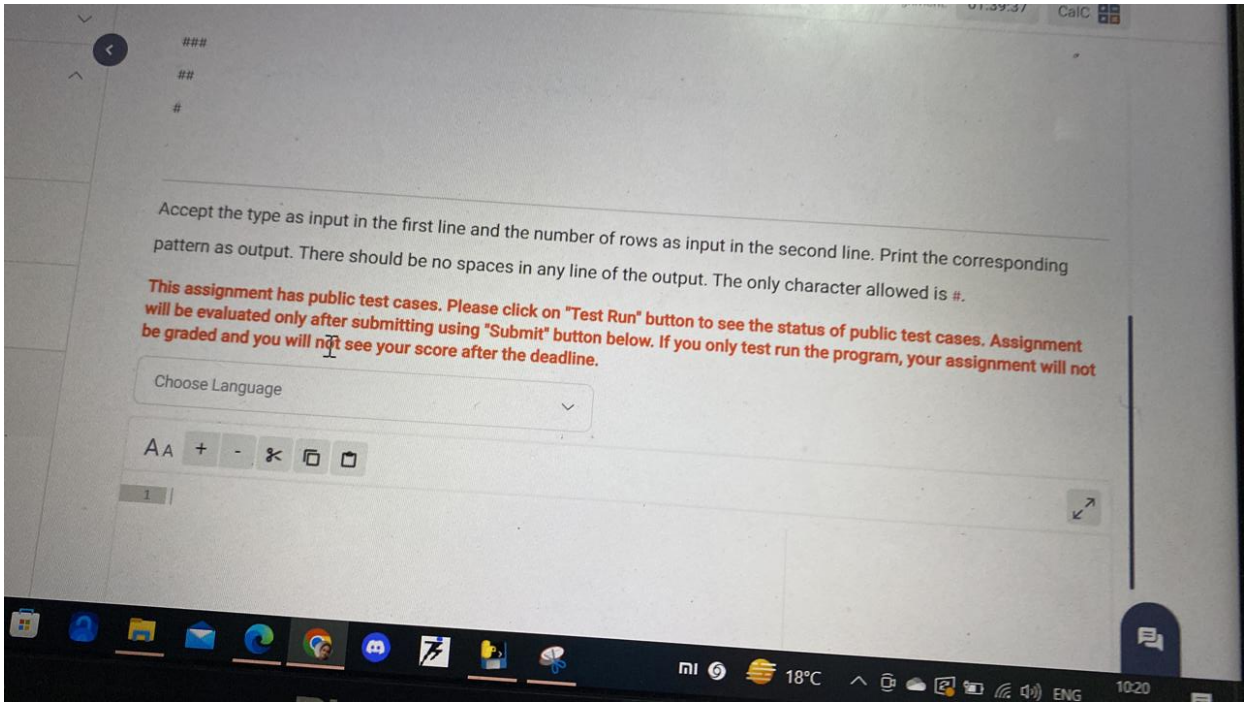
(1) Each test case will have a different number of courses (keys). You can assume that each dict will have at least one key.

(2) The order in which the elements are appended to the returned list doesn't matter.

18°C ENG 10:19 27-11-202


ctions
30 to12:00 PM
ssignment
ssignment
ssignment
ssignment
Accept a string as input and compute the following information:
(1) Number of letters in upper case
(2) Number of letters in lower case
(3) Number of digits
(4) Number of special characters
A special character is anything other than an alphabet or a digit. You have to accept input from the user and print output to the console. Input will be a single string. As an example, if the input is abDEF1234@#$%^, your output should be as follows:
UPPER=3
LOWER=2
DIGIT=4
SPECIAL=5
You can assume that the string will not have any blank spaces anywhere: either at the beginning, in the middle or at the
18°C
ENG
10:20
27-11-2022
F10
PrtScn F11
Insert F12
Delete
Backspace


:00 PM
This question is about printing triangular patterns. They come in two types. For $n = 5$, they are:
Type-1
#
##
###
####
#####
Type-2
#####
####
###
##
#
18°C
ENG
10:20
27-11-2022


###
##
#
Accept the type as input in the first line and the number of rows as input in the second line. Print the corresponding pattern as output. There should be no spaces in any line of the output. The only character allowed is #.
This assignment has public test cases. Please click on "Test Run" button to see the status of public test cases. Assignment will be evaluated only after submitting using "Submit" button below. If you only test run the program, your assignment will not be graded and you will not see your score after the deadline.
Choose Language
1
18°C
ENG
10:20

Fibonacci strings are defined as follows:

```
S_1 = 'a'
S_2 = 'b'
S_3 = S_1 + S_2 = 'ab'
S_4 = S_2 + S_3 = 'bab'
S_5 = S_3 + S_4 = 'abbab'
...
```

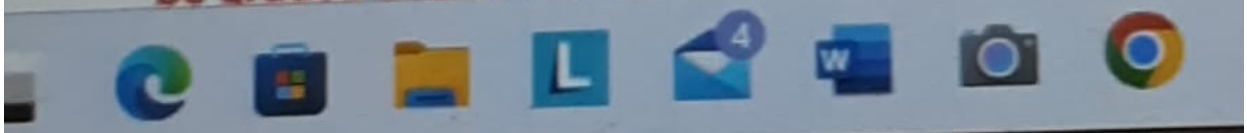
Write a function named `inverse` that accepts a F

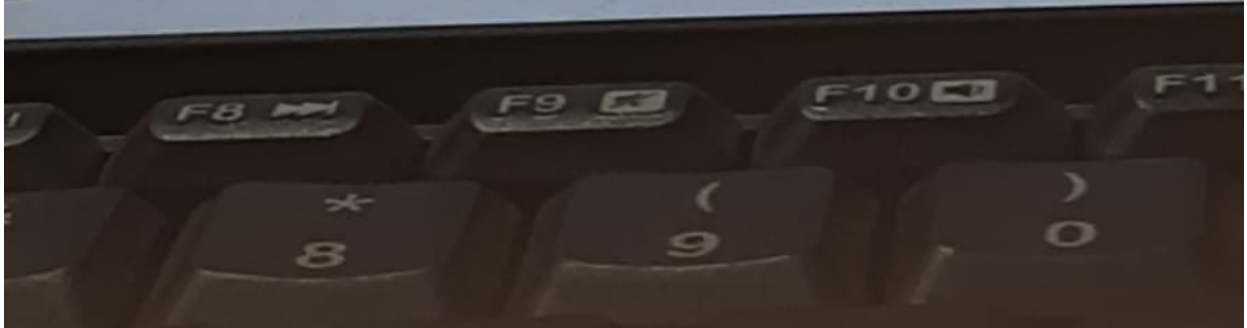
For example, `inverse('bab')` should return 4, a

You do not have to accept input from the user or

definition.

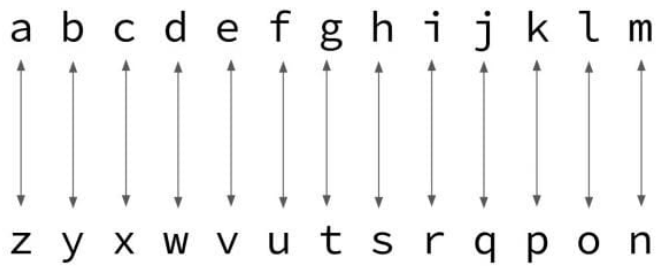
**This assignment has public test cases. Please click
will be evaluated only after submitting using "Subm
be graded and you will not see your score after the**





PPA 6

Accept a string of lowercase letters from the user and encrypt it using the following image:



Each letter in the string that appears in the the upper half should be replaced with the corresponding letter in the lower half and vice versa. Print the encrypted string as output.

```
word = input()

letters = 'abcdefghijklmnopqrstuvwxyz'

out = ''
forchar in word:
    ind = letters.index(char)
    out = out + letters[-ind - 1]

print(out)
```

```
S=list(input())
# count number of upper case,lowercase ,digits and special characters
CU=0
CL=0
ND=0
NS=0
for i in S:
    if i.isupper():
        CU+=1
    elif i.islower():
        CL+=1
    elif i.isdigit():
        ND+=1
    else:
        NS+=1
print(f'UPPER={CU}\nLOWER={CL}\nDIGITS={ND}\nSPECIAL={NS}')
```

```python
S=list(input())
# count number of upper case,lowercase ,digits and special characters
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CL=0
ND=0
NS=0
for i in S:
    if i.isupper():
        CU+=1
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        CL+=1
    elif i.isdigit():
        ND+=1
    else:
        NS+=1
print(f'UPPER={CU}\nLOWER={CL}\nDIGITS={ND}\nSPECIAL={NS}')
```
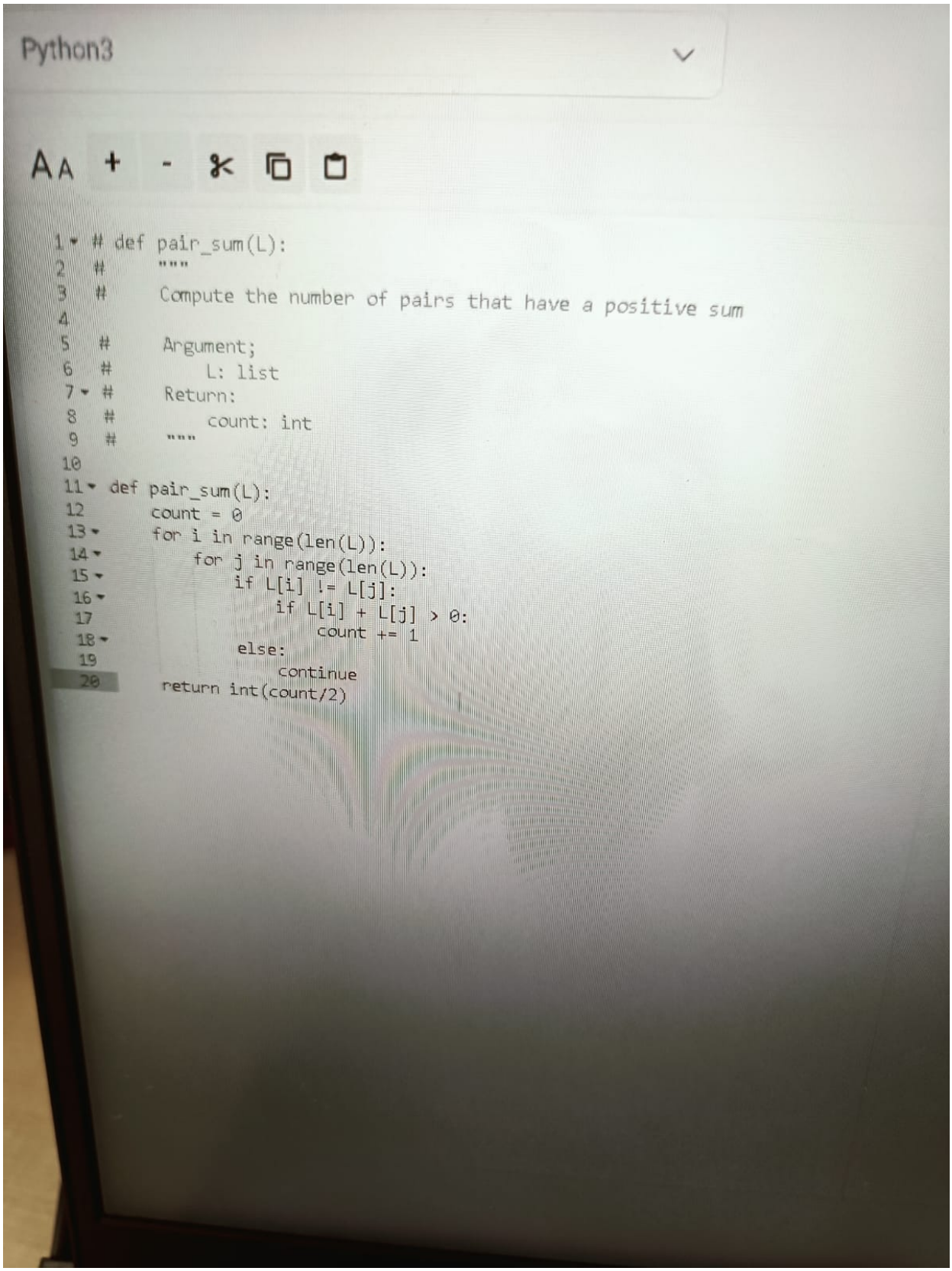

Python3

```
typ = input()
n = int(input())


if(typ == 'Type-2'):
    for x in range(1,n+1):
        print((n) * '#')
        n -=1
        if n == 0:
            break
else:
    for y in range(1,n+1):
        print(y * '#')
        if(y == n):
            break
```


Python3
AA + -
def pair_sum(L):
"""
Compute the number of pairs that have a positive sum
#
# Argument;
# L: list
# Return:
# count: int
# """
def pair_sum(L):
count = 0
for i in range(len(L)):
for j in range(len(L)):
if L[i] != L[j]:
if L[i] + L[j] > 0:
count += 1
else:
continue
return int(count/2)