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En la universidad "ACME" se desea calcular el promedio de cada uno de los alumnos, y el área de control escolar genero el archivo calificaciones_v2.csv para calcular el promedio por alumno, y tener un archivo con formato similar al archivo calificaciones_promedio_v2.csv.

importar librerias

```
In [1]: import pandas as pd
import numpy as np
```

verificar las versiones de las mismas

```
In [2]: pd.__version__
```

```
Out[2]: '1.5.0'
```

```
In [3]: np.__version__
```

```
Out[3]: '1.23.3'
```

leer el archivo usando pd

```
In [4]: calificaciones_v2 = pd.read_csv("calificaciones_v2.csv")
```

```
In [5]: calificaciones_v2
```

```
Out[5]:
```

	matricula	11111111
0	nombre	Alumno 1
1	grupo	TI11
2	Materia 1	1
3	Materia 2	8
4	Materia 3	1
...
428	Materia 3	10
429	Materia 4	6
430	Materia 5	8
431	Materia 6	10
432	estado	regular

433 rows × 2 columns

los datos repetidos estan en el indice 9,431,106 y 107

eliminar los datos repetidos por indice

```
In [6]: indices = [7,431,106,107]
calificaciones_v2 = calificaciones_v2.drop(indices,axis=0)
```

```
In [7]: calificaciones_v2.head(10)
```

```
Out[7]:
```

	matricula	11111111
0	nombre	Alumno 1
1	grupo	TI11
2	Materia 1	1
3	Materia 2	8
4	Materia 3	1
5	Materia 4	7
6	Materia 5	2
8	estado	regular
9	matricula	11111112
10	nombre	Alumno 2

formatear index

```
In [8]: calificaciones_v2 = calificaciones_v2.reset_index(drop=True)
```

verificar si se formateo el index

```
In [9]: calificaciones_v2.head(9)
```

```
Out[9]:
```

	matricula	11111111
0	nombre	Alumno 1
1	grupo	TI11
2	Materia 1	1
3	Materia 2	8
4	Materia 3	1
5	Materia 4	7
6	Materia 5	2
7	estado	regular
8	matricula	11111112

```
In [10]: calificaciones_v2.tail(3) ## muestra segun la cantidad colocada el numero de registros
```

```
Out[10]:
```

	matricula	11111111
426	Materia 4	6
427	Materia 5	8
428	estado	regular

separ en partes los dataframe para no afectar datos

```
In [11]: parte_1 = calificaciones_v2.loc[:231,:]
         parte_2 = calificaciones_v2.loc[231:,:]
```

verificar divicion correcta

```
In [12]: parte_1.head(10)
```

```
Out[12]:
```

	matricula	11111111
0	nombre	Alumno 1
1	grupo	TI11
2	Materia 1	1
3	Materia 2	8
4	Materia 3	1
5	Materia 4	7
6	Materia 5	2
7	estado	regular
8	matricula	11111112
9	nombre	Alumno 2

```
In [13]: parte_2.tail(3)
```

```
Out[13]:
```

	matricula	11111111
426	Materia 4	6
427	Materia 5	8
428	estado	regular

agregar materia faltante sin afectar los Id

```
In [14]: parte_1.loc[231] = ["Materia 5",0]
```

C:\Users\lenovo\AppData\Local\Temp\ipykernel_40648\3524234564.py:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
parte_1.loc[231] = ["Materia 5",0]
```

concatenar los dataframes y formatear id

```
In [15]: partes = [parte_1,parte_2]  
calificaciones_v2 = pd.concat(partes, sort=False)
```

```
In [16]: calificaciones_v2.tail(4)
```

```
Out[16]:
```

	matricula	11111111
425	Materia 3	10
426	Materia 4	6
427	Materia 5	8
428	estado	regular

```
In [17]: calificaciones_v2=calificaciones_v2.reset_index(drop=True)
```

```
In [18]: calificaciones_v2
```

```
Out[18]:
```

	matricula	11111111
0	nombre	Alumno 1
1	grupo	TI11
2	Materia 1	1
3	Materia 2	8
4	Materia 3	1
...
425	Materia 2	4
426	Materia 3	10
427	Materia 4	6
428	Materia 5	8
429	estado	regular

430 rows × 2 columns

agregar el estado faltante

```
In [19]: parte_1 = calificaciones_v2.iloc[:322,:]  
parte_2 = calificaciones_v2.iloc[322,:]
```

```
In [20]: parte_1
```

```
Out[20]:
```

	matricula	11111111
0	nombre	Alumno 1
1	grupo	TI11
2	Materia 1	1
3	Materia 2	8
4	Materia 3	1
...
317	Materia 1	7
318	Materia 2	1
319	Materia 3	4
320	Materia 4	0
321	Materia 5	6

322 rows × 2 columns

```
In [21]: parte_1.loc[322] = ["estado", "regular"]
```

C:\Users\lenovo\AppData\Local\Temp\ipykernel_40648\4035026938.py:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
parte_1.loc[322] = ["estado", "regular"]

```
In [22]: partes = [parte_1, parte_2]  
calificaciones_v2 = pd.concat(partes, sort=False)
```

```
In [23]: calificaciones_v2 = calificaciones_v2.reset_index(drop=True)
```

```
In [24]: calificaciones_v2
```

Out[24]: **matricula** 11111111

0	nombre	Alumno 1
1	grupo	TI11
2	Materia 1	1
3	Materia 2	8
4	Materia 3	1
...
426	Materia 2	4
427	Materia 3	10
428	Materia 4	6
429	Materia 5	8
430	estado	regular

431 rows × 2 columns

cambiar todos los campos vacios por 0

```
In [25]: calificaciones_v2 = calificaciones_v2.fillna(0)
```

exportar a csv

```
In [26]: calificaciones_v2 = calificaciones_v2.to_csv("calificaciones_vs_datos_completos.csv")
```

abrir con numpy

```
In [27]: import csv
```

```
In [28]: with open("calificaciones_vs_datos_completos.csv") as file:  
    calificaciones_v2 = list(csv.reader(file,delimiter=","))
```

```
In [29]: calificaciones_v2
```

```
Out[29]: [['', 'matricula', '11111111'],
['0', 'nombre', 'Alumno 1'],
['1', 'grupo', 'TI11'],
['2', 'Materia 1', '1'],
['3', 'Materia 2', '8'],
['4', 'Materia 3', '1'],
['5', 'Materia 4', '7'],
['6', 'Materia 5', '2'],
['7', 'estado', 'regular'],
['8', 'matricula', '11111112'],
['9', 'nombre', 'Alumno 2'],
['10', 'grupo', 'TI11'],
['11', 'Materia 1', '10'],
['12', 'Materia 2', '7'],
['13', 'Materia 3', '1'],
['14', 'Materia 4', '8'],
['15', 'Materia 5', '5'],
['16', 'estado', 'regular'],
['17', 'matricula', '11111113'],
['18', 'nombre', 'Alumno 3'],
['19', 'grupo', 'TI11'],
['20', 'Materia 1', '0'],
['21', 'Materia 2', '1'],
['22', 'Materia 3', '1'],
['23', 'Materia 4', '3'],
['24', 'Materia 5', '0'],
['25', 'estado', 'regular'],
['26', 'matricula', '11111114'],
['27', 'nombre', 'Alumno 4'],
['28', 'grupo', 'TI11'],
['29', 'Materia 1', '0'],
['30', 'Materia 2', '4'],
['31', 'Materia 3', '3'],
['32', 'Materia 4', '2'],
['33', 'Materia 5', '7'],
['34', 'estado', 'regular'],
['35', 'matricula', '11111115'],
['36', 'nombre', 'Alumno 5'],
['37', 'grupo', 'TI11'],
['38', 'Materia 1', '9'],
['39', 'Materia 2', '10'],
['40', 'Materia 3', '3'],
['41', 'Materia 4', '9'],
['42', 'Materia 5', '2'],
['43', 'estado', 'regular'],
['44', 'matricula', '11111116'],
['45', 'nombre', 'Alumno 6'],
['46', 'grupo', 'TI11'],
['47', 'Materia 1', '1'],
['48', 'Materia 2', '3'],
['49', 'Materia 3', '8'],
['50', 'Materia 4', '1'],
['51', 'Materia 5', '7'],
['52', 'estado', 'regular'],
['53', 'matricula', '11111117'],
['54', 'nombre', 'Alumno 7'],
['55', 'grupo', 'TI11'],
['56', 'Materia 1', '4'],
['57', 'Materia 2', '7'],
['58', 'Materia 3', '1'],
```

['59', 'Materia 4', '6'],
['60', 'Materia 5', '5'],
['61', 'estado', 'regular'],
['62', 'matricula', '11111118'],
['63', 'nombre', 'Alumno 8'],
['64', 'grupo', 'TI11'],
['65', 'Materia 1', '10'],
['66', 'Materia 2', '1'],
['67', 'Materia 3', '7'],
['68', 'Materia 4', '10'],
['69', 'Materia 5', '0'],
['70', 'estado', 'regular'],
['71', 'matricula', '11111119'],
['72', 'nombre', 'Alumno 9'],
['73', 'grupo', 'TI11'],
['74', 'Materia 1', '5'],
['75', 'Materia 2', '5'],
['76', 'Materia 3', '4'],
['77', 'Materia 4', '0'],
['78', 'Materia 5', '3'],
['79', 'estado', 'regular'],
['80', 'matricula', '11111120'],
['81', 'nombre', 'Alumno 10'],
['82', 'grupo', 'TI11'],
['83', 'Materia 1', '5'],
['84', 'Materia 2', '7'],
['85', 'Materia 3', '3'],
['86', 'Materia 4', '3'],
['87', 'Materia 5', '4'],
['88', 'estado', 'regular'],
['89', 'matricula', '11111121'],
['90', 'nombre', 'Alumno 11'],
['91', 'grupo', 'TI11'],
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['93', 'Materia 2', '1'],
['94', 'Materia 3', '3'],
['95', 'Materia 4', '7'],
['96', 'Materia 5', '0'],
['97', 'estado', 'regular'],
['98', 'matricula', '11111122'],
['99', 'nombre', 'Alumno 12'],
['100', 'grupo', 'TI11'],
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['103', 'Materia 3', '5'],
['104', 'Materia 4', '4'],
['105', 'Materia 5', '5'],
['106', 'estado', 'regular'],
['107', 'matricula', '11111123'],
['108', 'nombre', 'Alumno 13'],
['109', 'grupo', 'TI12'],
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['111', 'Materia 2', '2'],
['112', 'Materia 3', '3'],
['113', 'Materia 4', '0'],
['114', 'Materia 5', '1'],
['115', 'estado', 'regular'],
['116', 'matricula', '11111124'],
['117', 'nombre', 'Alumno 14'],
['118', 'grupo', 'TI12'],

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['120', 'Materia 2', '2'],
['121', 'Materia 3', '10'],
['122', 'Materia 4', '0'],
['123', 'Materia 5', '6'],
['124', 'estado', 'regular'],
['125', 'matricula', '11111125'],
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['127', 'grupo', 'TI12'],
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['129', 'Materia 2', '9'],
['130', 'Materia 3', '1'],
['131', 'Materia 4', '3'],
['132', 'Materia 5', '1'],
['133', 'estado', 'regular'],
['134', 'matricula', '11111126'],
['135', 'nombre', 'Alumno 16'],
['136', 'grupo', 'TI12'],
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['138', 'Materia 2', '2'],
['139', 'Materia 3', '1'],
['140', 'Materia 4', '7'],
['141', 'Materia 5', '7'],
['142', 'estado', 'regular'],
['143', 'matricula', '11111127'],
['144', 'nombre', 'Alumno 17'],
['145', 'grupo', 'TI12'],
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['148', 'Materia 3', '1'],
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['161', 'matricula', '11111129'],
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['166', 'Materia 3', '7'],
['167', 'Materia 4', '8'],
['168', 'Materia 5', '2'],
['169', 'estado', 'regular'],
['170', 'matricula', '11111130'],
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['179', 'matricula', '11111131'],
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['187', 'estado', 'regular'],
['188', 'matricula', '11111132'],
['189', 'nombre', 'Alumno 22'],
['190', 'grupo', 'TI12'],
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['195', 'Materia 5', '3'],
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['197', 'matricula', '11111133'],
['198', 'nombre', 'Alumno 23'],
['199', 'grupo', 'TI12'],
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['203', 'Materia 4', '7'],
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['205', 'estado', 'regular'],
['206', 'matricula', '11111134'],
['207', 'nombre', 'Alumno 24'],
['208', 'grupo', 'TI41'],
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['215', 'matricula', '11111135'],
['216', 'nombre', 'Alumno 25'],
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['233', 'matricula', '11111137'],
['234', 'nombre', 'Alumno 27'],
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['251', 'matricula', '11111139'],
['252', 'nombre', 'Alumno 29'],
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['257', 'Materia 4', '10'],
['258', 'Materia 5', '1'],
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['260', 'matricula', '11111140'],
['261', 'nombre', 'Alumno 30'],
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['270', 'nombre', 'Alumno 31'],
['271', 'grupo', 'TI41'],
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['274', 'Materia 3', '4'],
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['279', 'nombre', 'Alumno 32'],
['280', 'grupo', 'TI41'],
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['287', 'matricula', '11111143'],
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['302', 'Materia 4', '3'],
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['311', 'Materia 4', '7'],
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['313', 'estado', 'regular'],
['314', 'matricula', '11111146'],
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['323', 'matricula', '11111147'],
['324', 'nombre', 'Alumno 37'],
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['327', 'Materia 2', '6'],
['328', 'Materia 3', '4'],
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['331', 'estado', 'regular'],
['332', 'matricula', '11111148'],
['333', 'nombre', 'Alumno 38'],
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['340', 'estado', 'regular'],
['341', 'matricula', '11111149'],
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['351', 'nombre', 'Alumno 40'],
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['354', 'Materia 2', '0'],
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['364', 'Materia 3', '1'],
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['366', 'Materia 5', '9'],
['367', 'estado', 'regular'],
['368', 'matricula', '11111152'],
['369', 'nombre', 'Alumno 42'],
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['371', 'Materia 1', '2'],
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['376', 'estado', 'regular'],
['377', 'matricula', '11111153'],
['378', 'nombre', 'Alumno 43'],
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['384', 'Materia 5', '0'],
['385', 'estado', 'regular'],
['386', 'matricula', '11111154'],
['387', 'nombre', 'Alumno 44'],
['388', 'grupo', 'IDGS91'],
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['392', 'Materia 4', '7'],
['393', 'Materia 5', '10'],
['394', 'estado', 'regular'],
['395', 'matricula', '11111155'],
['396', 'nombre', 'Alumno 45'],
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['401', 'Materia 4', '8'],
['402', 'Materia 5', '6'],
['403', 'estado', 'regular'],
['404', 'matricula', '11111156'],
['405', 'nombre', 'Alumno 46'],
['406', 'grupo', 'IDGS71'],
['407', 'Materia 1', '10'],
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```

pasar a un array de numpy

```
In [30]: calificaciones_v2 = np.array(calificaciones_v2)
```

```
In [31]: calificaciones_v2
```

```
Out[31]: array(['', 'matricula', '11111111'],
              ['0', 'nombre', 'Alumno 1'],
              ['1', 'grupo', 'TI11'],
              ...,
              ['428', 'Materia 4', '6'],
              ['429', 'Materia 5', '8'],
              ['430', 'estado', 'regular']], dtype='<U9')
```

eliminar index

```
In [32]: calificaciones_v2 = np.delete(calificaciones_v2,0,1)
```

```
In [33]: calificaciones_v2
```

```
Out[33]: array([[ 'matricula', '11111111'],
                [ 'nombre', 'Alumno 1'],
                [ 'grupo', 'TI11'],
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['estado', 'regular']], dtype='<U9')
```

obtener las cabeceras

```
In [34]: cabecera = calificaciones_v2.T[0]
```

```
In [35]: cabecera
```

[illegible]

```
'Materia 4', 'Materia 5', 'estado', 'matricula', 'nombre', 'grupo',
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```

```
In [36]: np.unique(cabecera)
```

```
Out[36]: array(['Materia 1', 'Materia 2', 'Materia 3', 'Materia 4', 'Materia 5',
'estado', 'grupo', 'matricula', 'nombre'], dtype='<U9')
```

```
In [37]: np.unique(cabecera).size
```

```
Out[37]: 9
```

```
In [38]: cabecera = cabecera[:9]
cabecera
```

```
Out[38]: array(['matricula', 'nombre', 'grupo', 'Materia 1', 'Materia 2',
'Materia 3', 'Materia 4', 'Materia 5', 'estado'], dtype='<U9')
```

registros

```
In [39]: total_cabecera = cabecera.size
```

```
In [40]: total_registros = calificaciones_v2.T[0].size
```

```
In [41]: total = total_registros/total_cabecera
total
```

```
Out[41]: 48.0
```

eliminar columna de cabecera

```
In [42]: datos = np.delete(calificaciones_v2,0,1)
```

```
In [43]: datos
```



```
Out[43]: array(['11111111'],
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               ['TI11'],
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['regular'],
['11111145'],
['Alumno 35'],
['IDGS91'],
['0'],
['7'],
['10'],
['7'],
['7'],
['regular'],
['11111146'],
['Alumno 36'],
['IDGS91'],
['7'],
['1'],
['4'],
['0'],
['6'],
['regular'],
['11111147'],
['Alumno 37'],
['IDGS91'],
['6'],
['6'],
['4'],
['3'],
['0'],
['regular'],
['11111148'],
['Alumno 38'],
['IDGS91'],
['0'],
['6'],
['6'],
['3'],
['5'],
['regular'],
['11111149'],
['Alumno 39'],
['IDGS91'],
['8'],
['7'],
['9'],
['5'],
['2'],
['regular'],
['11111150'],
['Alumno 40'],
['IDGS91'],
['1'],
['0'],
['3'],
['4'],
['10'],
['regular'],
```

```
['11111151'],
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['IDGS91'],
['6'],
['5'],
['1'],
['5'],
['9'],
['regular'],
['11111152'],
['Alumno 42'],
['IDGS91'],
['2'],
['0'],
['9'],
['9'],
['5'],
['regular'],
['11111153'],
['Alumno 43'],
['IDGS91'],
['3'],
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['0'],
['regular'],
['11111154'],
['Alumno 44'],
['IDGS91'],
['3'],
['1'],
['1'],
['7'],
['10'],
['regular'],
['11111155'],
['Alumno 45'],
['IDGS91'],
['4'],
['1'],
['2'],
['8'],
['6'],
['regular'],
['11111156'],
['Alumno 46'],
['IDGS71'],
['10'],
['1'],
['10'],
['0'],
['7'],
['regular'],
['11111157'],
['Alumno 47'],
['IDGS71'],
['9'],
['10'],
['1'],
```

```

['3'],
['9'],
['regular'],
['11111158'],
['Alumno 48'],
['IDGS71'],
['4'],
['4'],
['10'],
['6'],
['8'],
['regular']], dtype='<U9')

```

reshape de los datos

```

In [44]: total = int(total)
total_cabecera=int(total_cabecera)

```

```

In [45]: datos = datos.reshape(total,total_cabecera)

```

```

In [46]: datos[:15]

```

```

Out[46]: array([[ '11111111', 'Alumno 1', 'TI11', '1', '8', '1', '7', '2',
        'regular'],
        [ '11111112', 'Alumno 2', 'TI11', '10', '7', '1', '8', '5',
        'regular'],
        [ '11111113', 'Alumno 3', 'TI11', '0', '1', '1', '3', '0',
        'regular'],
        [ '11111114', 'Alumno 4', 'TI11', '0', '4', '3', '2', '7',
        'regular'],
        [ '11111115', 'Alumno 5', 'TI11', '9', '10', '3', '9', '2',
        'regular'],
        [ '11111116', 'Alumno 6', 'TI11', '1', '3', '8', '1', '7',
        'regular'],
        [ '11111117', 'Alumno 7', 'TI11', '4', '7', '1', '6', '5',
        'regular'],
        [ '11111118', 'Alumno 8', 'TI11', '10', '1', '7', '10', '0',
        'regular'],
        [ '11111119', 'Alumno 9', 'TI11', '5', '5', '4', '0', '3',
        'regular'],
        [ '11111120', 'Alumno 10', 'TI11', '5', '7', '3', '3', '4',
        'regular'],
        [ '11111121', 'Alumno 11', 'TI11', '6', '1', '3', '7', '0',
        'regular'],
        [ '11111122', 'Alumno 12', 'TI11', '7', '2', '5', '4', '5',
        'regular'],
        [ '11111123', 'Alumno 13', 'TI12', '5', '2', '3', '0', '1',
        'regular'],
        [ '11111124', 'Alumno 14', 'TI12', '5', '2', '10', '0', '6',
        'regular'],
        [ '11111125', 'Alumno 15', 'TI12', '9', '9', '1', '3', '1',
        'regular']], dtype='<U9')

```

datos de los alumnos

```

In [47]: info_alumnos = np.array(datos[:, :3])
info_alumnos[:10]

```



```
Out[47]: array([[ '11111111', 'Alumno 1', 'TI11'],
               [ '11111112', 'Alumno 2', 'TI11'],
               [ '11111113', 'Alumno 3', 'TI11'],
               [ '11111114', 'Alumno 4', 'TI11'],
               [ '11111115', 'Alumno 5', 'TI11'],
               [ '11111116', 'Alumno 6', 'TI11'],
               [ '11111117', 'Alumno 7', 'TI11'],
               [ '11111118', 'Alumno 8', 'TI11'],
               [ '11111119', 'Alumno 9', 'TI11'],
               [ '11111120', 'Alumno 10', 'TI11']], dtype='<U9')
```

calificaciones de las materias

```
In [48]: materias = np.array(datos[:,3:8],dtype=float)
```

```
In [49]: materias[:15]
```

```
Out[49]: array([[ 1.,  8.,  1.,  7.,  2.],
                 [10.,  7.,  1.,  8.,  5.],
                 [ 0.,  1.,  1.,  3.,  0.],
                 [ 0.,  4.,  3.,  2.,  7.],
                 [ 9., 10.,  3.,  9.,  2.],
                 [ 1.,  3.,  8.,  1.,  7.],
                 [ 4.,  7.,  1.,  6.,  5.],
                 [10.,  1.,  7., 10.,  0.],
                 [ 5.,  5.,  4.,  0.,  3.],
                 [ 5.,  7.,  3.,  3.,  4.],
                 [ 6.,  1.,  3.,  7.,  0.],
                 [ 7.,  2.,  5.,  4.,  5.],
                 [ 5.,  2.,  3.,  0.,  1.],
                 [ 5.,  2., 10.,  0.,  6.],
                 [ 9.,  9.,  1.,  3.,  1.]])
```

```
In [50]: no_materias = 5
promedios = []
for index in range(int(total)):
    promedios.append(["regular",materias[index].sum()/no_materias])
promedio = np.array(promedios)
```

```
In [51]: promedios
```

```
Out[51]: [['regular', 3.8],
          ['regular', 6.2],
          ['regular', 1.0],
          ['regular', 3.2],
          ['regular', 6.6],
          ['regular', 4.0],
          ['regular', 4.6],
          ['regular', 5.6],
          ['regular', 3.4],
          ['regular', 4.4],
          ['regular', 3.4],
          ['regular', 4.6],
          ['regular', 2.2],
          ['regular', 4.6],
          ['regular', 4.6],
          ['regular', 3.6],
          ['regular', 1.0],
          ['regular', 3.6],
          ['regular', 5.0],
          ['regular', 2.6],
          ['regular', 6.4],
          ['regular', 4.6],
          ['regular', 6.0],
          ['regular', 4.2],
          ['regular', 3.8],
          ['regular', 2.8],
          ['regular', 2.2],
          ['regular', 7.4],
          ['regular', 3.4],
          ['regular', 5.8],
          ['regular', 5.8],
          ['regular', 3.2],
          ['regular', 4.2],
          ['regular', 3.0],
          ['regular', 6.2],
          ['regular', 3.6],
          ['regular', 3.8],
          ['regular', 4.0],
          ['regular', 6.2],
          ['regular', 3.6],
          ['regular', 5.2],
          ['regular', 5.0],
          ['regular', 1.4],
          ['regular', 4.4],
          ['regular', 4.2],
          ['regular', 5.6],
          ['regular', 6.4],
          ['regular', 6.4]]
```

agregar la columna de promedio a las cabeceras

```
In [52]: cabecera = np.concatenate((cabecera,['promedio final']),axis=0,dtype=str)
```

```
In [53]: cabecera
```

```
Out[53]: array(['matricula', 'nombre', 'grupo', 'Materia 1', 'Materia 2',
                'Materia 3', 'Materia 4', 'Materia 5', 'estado', 'promedio final'],
              dtype='<U14')
```

añadir info del alumno con calificaciones, promedio y estado

```
In [54]: todos = np.concatenate((info_alumnos,materias,promedios),axis=1,dtype=str)
        todos[:5]
```

```
Out[54]: array([[ '11111111', 'Alumno 1', 'TI11', '1.0', '8.0', '1.0', '7.0',
        '2.0', 'regular', '3.8'],
        [ '11111112', 'Alumno 2', 'TI11', '10.0', '7.0', '1.0', '8.0',
        '5.0', 'regular', '6.2'],
        [ '11111113', 'Alumno 3', 'TI11', '0.0', '1.0', '1.0', '3.0',
        '0.0', 'regular', '1.0'],
        [ '11111114', 'Alumno 4', 'TI11', '0.0', '4.0', '3.0', '2.0',
        '7.0', 'regular', '3.2'],
        [ '11111115', 'Alumno 5', 'TI11', '9.0', '10.0', '3.0', '9.0',
        '2.0', 'regular', '6.6']], dtype='<U32')
```

exportar a csv

```
In [55]: todos = pd.DataFrame(data=todos,columns=cabecera,dtype=str)
```

```
In [56]: todos.head(8)
```

```
Out[56]:
```

	matricula	nombre	grupo	Materia 1	Materia 2	Materia 3	Materia 4	Materia 5	estado	promedio final
0	11111111	Alumno 1	TI11	1.0	8.0	1.0	7.0	2.0	regular	3.8
1	11111112	Alumno 2	TI11	10.0	7.0	1.0	8.0	5.0	regular	6.2
2	11111113	Alumno 3	TI11	0.0	1.0	1.0	3.0	0.0	regular	1.0
3	11111114	Alumno 4	TI11	0.0	4.0	3.0	2.0	7.0	regular	3.2
4	11111115	Alumno 5	TI11	9.0	10.0	3.0	9.0	2.0	regular	6.6
5	11111116	Alumno 6	TI11	1.0	3.0	8.0	1.0	7.0	regular	4.0
6	11111117	Alumno 7	TI11	4.0	7.0	1.0	6.0	5.0	regular	4.6
7	11111118	Alumno 8	TI11	10.0	1.0	7.0	10.0	0.0	regular	5.6

```
In [57]: calificaciones_v2_finales = todos.to_csv("calificaciones_v2_finales.csv")
```