Data Challenge

UVM & Educational Landscape in Mexico

July 2022

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01 – UVM´s Profile

The Universidad del Valle de Mexico (UVM) is a privite mexican university that has been educating students for 62 years.

It has presence in 18 mexican states (with 36 campuses), and it is part of different international networks. The UVM has 3 divisions: Highschool, University and Graduate School.

UVM has two modalities, and according to the INEGI and the UNAM ‘Modalidad Escolarizada’ can be define as the modality where the school classes are taught at a physical space from Monday to Friday while ‘Modalidad No Escolarizada’ is a flexible education with a variable schedule and different modalities (can be taught online or in a physical space).

01 – UVM´s Profile

For the following analysys, we will just consider UVM´s University and Graduate School, with the data of the 2020-2021 school cycle

Table #1. Students divided by Academic Level

MODALIDAD TIPO	Escolarizada	NoEscolarizada	Total
Licenciatura	45970	19194	65164
Posgrado	2326	14400	16726
Total	48296	33594	81890

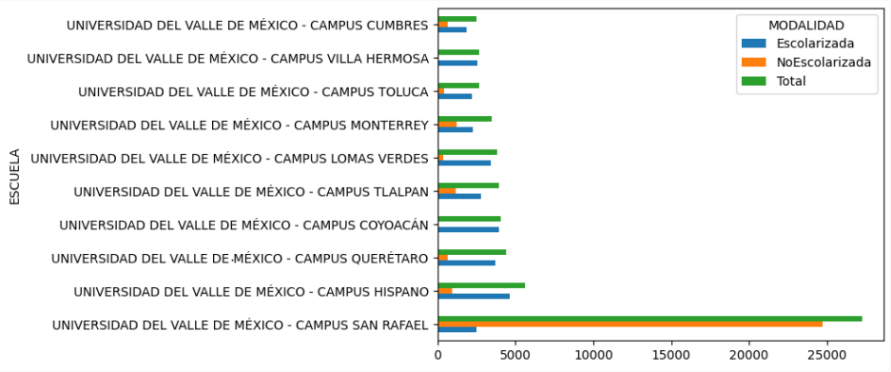
Table #2. Students divided by State (Top 5 States)

MODALIDAD ENTIDAD_FEDERATIVA	Escolarizada	NoEscolarizada	Total
Total	48296.0	33594.0	81890
CIUDAD DE MÉXICO	9939.0	26586.0	36525
MÉXICO	12468.0	2019.0	14487
NUEVO LEÓN	4114.0	1888.0	6002
QUERÉTARO	3719.0	676.0	4395
JALISCO	2457.0	760.0	3217

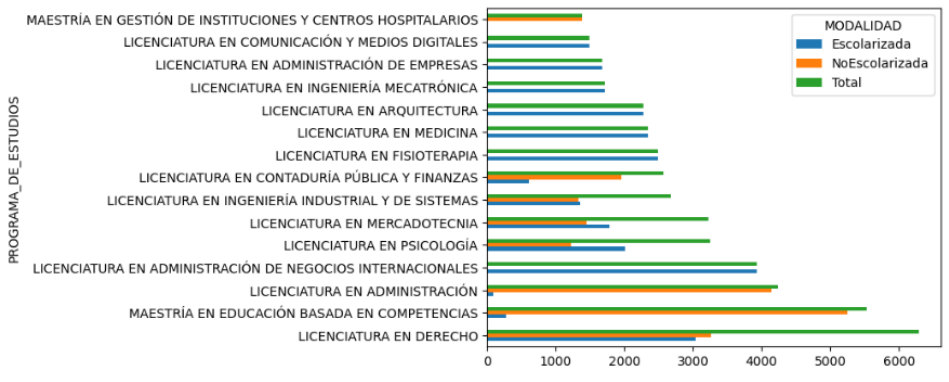
On one hand the data in table 1 shows how Undergraduate School is the academic level with the higher number of students (80% of the total students enrolled in the UVM), in the other hand, talking about modality, students in undergraduate school prefer ‘Escolarizada’ (70% of the total undergraduates) while students in graduate school prefer ‘No Escolarizada’ (86%) . In table 2, it is evident how Mexico City is where the UVM had more students enrolled in the 2020 – 2021 cycle, noticing how 72% of Mexico City alumni are in the ‘No Escolarizada’ Modality

01 – UVM´s Profile

Graph #1. Student distribution per Campus(Top 10 Campuses)



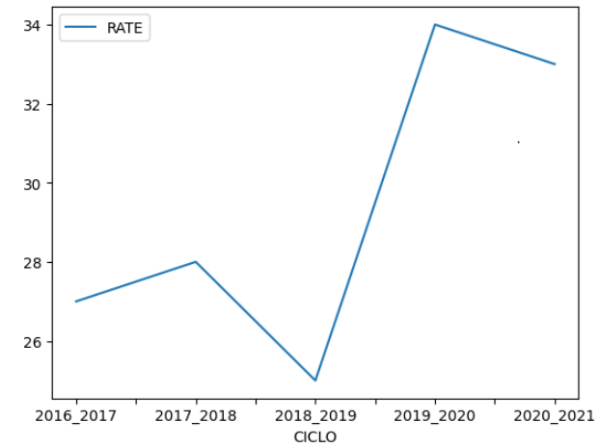
Graph #2 Student distribution per Academic Degree(Top 10)



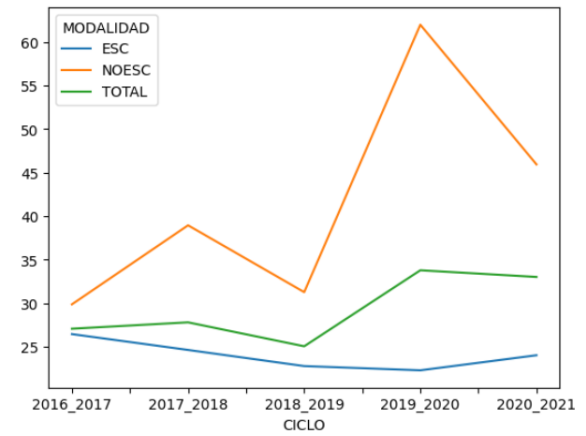
It´s remarkable how the biggest UVM campus (Campus San Rafael, in Mexico City) has the majority of it´s students enrolled in the “No Escolarizada” modality. Analyzing the distribution of students by academic degree, we can notice how the top 3 programs have most of the students enrolled in the “No Escolarizada” modality, indicating how this modality is one of the key characteristics of the University.

02 – UVM´s Performance

Graph #3. Growth Rate by Academic Cycle



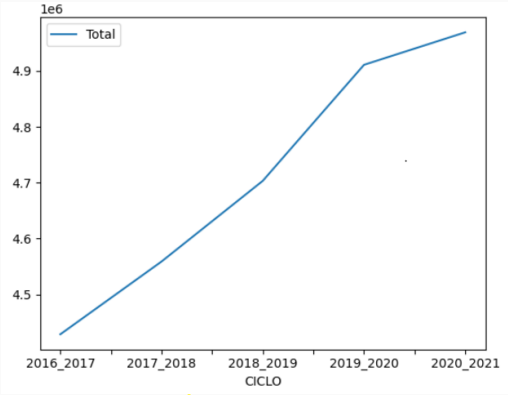
Graph #4. Growth Rate by Modality



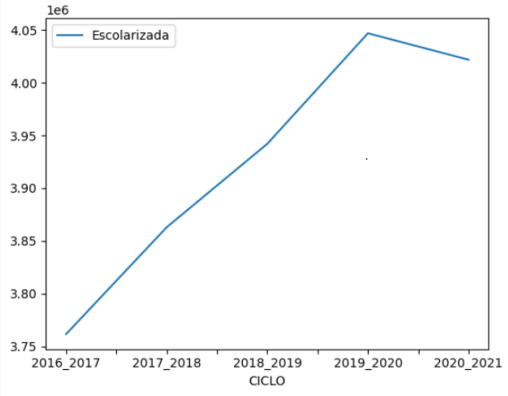
Graph #3 shows how UVM´s growth rate increased around 6% in the last 2 years. Analyzing the growth rate by modality (Graph #4) , it´s evident once again, how modality “No Escolarizada” is a key characteristic of this University, and the growth rate increase was due to the enrollment´s increase in this modality. As we know, the pandemic promoted remote work and school, so we can say COVID-19 was beneficial to the UVM because the modality “No Escolarizada” could experience a growth rate of around 30 percentual points (2019-2020 vs 2018-2019 cycle) . As the pandemic has been ending and we return to a “normal” routine, we can se how society returns to physical spaces or adopts hybrid models finding a balance between online/flexible (“No Escolarizada”) and offline (“Escolarizada”) modalities; considering a hybrid model (decrease in “No Escolarizada”, increase in “Escolarizada” modality (2020-2021 vs 2019-2020 cycle)) we can expect the UVM´s growth rate for 2021-2022 to be similar to the growth rate of 2020-2021 (growth rate of 33%) .

03 – UVM´s Competitive Landscape

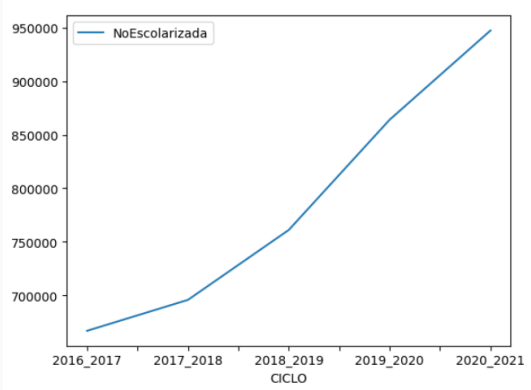
Graph #5. Total Number of Students in Mexico



Graph #6. Modality "Escolarizada" Number of students in Mexico



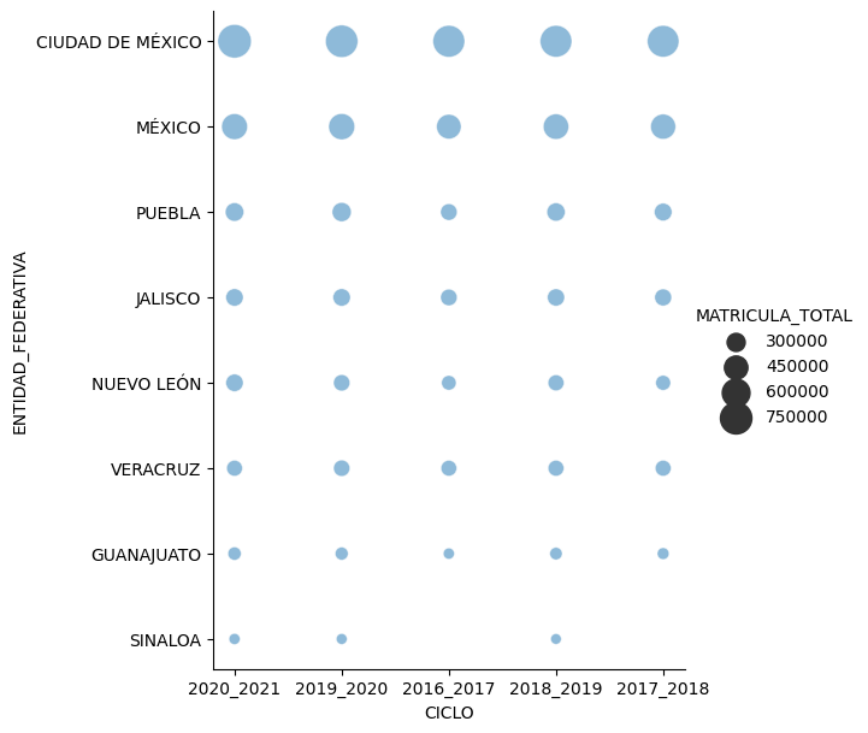
Graph #7. Modality "No Escolarizada" Number of students in Mexico



Mexico´s market for graduate and undergraduate students is of almost 5 million, and it has been increasing during the last five years (5 million students in 2021 vs 4.5 million students in 2016). Analyzing the market by modality, it´s evident how "Escolarizada" had been growing till the last academic cycle, where it shows a downfall vs 2019-2020. Still this modality is the one that has the biggest share of the market (80% of the total students prefers the modality "Escolarizada"). Analyzing the trend of "No Escolarizada", it is remarkable how this modality shows a constant growth

03 – UVM´s Competitive Landscape

Graph #8. Student distribution per Entidad Federativa



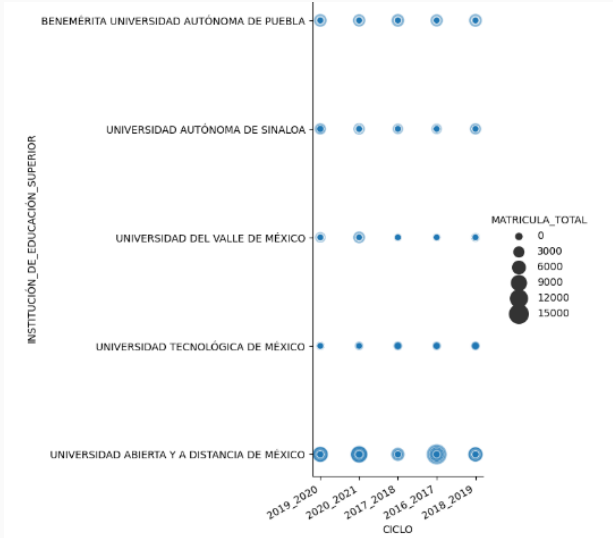
Looking into the distribution of students by State, it is noticeable how Mexico City is by far the one with the highest concentration. In second place, we can find “Mexico” or “Estado de Mexico”, that is near Mexico City. In the next places we have Puebla, Jalisco and Nuevo Leon, states that are promoting higher education for their population.

03 – UVM´s Competitive Landscape

Table #3. UVM´s main competitors

CICLO	2016_2017	2017_2018	2018_2019	2019_2020	2020_2021	Total
INSTITUCIÓN_DE_EDUCACIÓN_SUPERIOR						
Total	399077	365226	391922	415958	430255	2002438
UNIVERSIDAD ABIERTA Y A DISTANCIA DE MÉXICO	105785	51998	72474	82141	101901	414299
UNIVERSIDAD AUTÓNOMA DE SINALOA	78200	81473	83315	84148	84751	411887
BENEMÉRITA UNIVERSIDAD AUTÓNOMA DE PUEBLA	74040	78761	81492	85321	84179	403793
UNIVERSIDAD TECNOLÓGICA DE MÉXICO	67967	73865	82914	84908	77534	387188
UNIVERSIDAD DEL VALLE DE MÉXICO	73085	79129	71727	79440	81890	385271

Graph #9, UVM´s main competitors



The UVM has 4 main competitors, which can be seen in Table 3. To understand which were UVM´s main competitors, the mean of the UVM students enrolled over the years was determined, and then an upper (UVM´s enrollment mean *1.1) and a lower limit (UVM´s enrollment mean *0.9) were established. Once the “student range” was established, the universities with enrolled students in that range were found. To summarize, UVM´s competitors are those universities that have similar enrolled students than the UVM.

03 – UVM´s Competitive Landscape

Table #4. UVM´s & competitors' presence

INSTITUCIÓN_DE_EDUCACIÓN_SUPERIOR	ENTIDAD_FEDERATIVA
UNIVERSIDAD DEL VALLE DE MÉXICO	18
UNIVERSIDAD TECNOLÓGICA DE MÉXICO	5
BENEMÉRITA UNIVERSIDAD AUTÓNOMA DE PUEBLA	1
UNIVERSIDAD ABIERTA Y A DISTANCIA DE MÉXICO	1
UNIVERSIDAD AUTÓNOMA DE SINALOA	1

Table #5. UVM´s & competitors Programs

INSTITUCIÓN_DE_EDUCACIÓN_SUPERIOR	MODALIDAD Escolarizada	NoEscolarizada	Total
UNIVERSIDAD DEL VALLE DE MÉXICO	193.0	104.0	297
BENEMÉRITA UNIVERSIDAD AUTÓNOMA DE PUEBLA	264.0	17.0	281
UNIVERSIDAD AUTÓNOMA DE SINALOA	209.0	33.0	242
UNIVERSIDAD TECNOLÓGICA DE MÉXICO	106.0	68.0	174
UNIVERSIDAD ABIERTA Y A DISTANCIA DE MÉXICO	NaN	47.0	47

UVM has 2 competitive advantages vs it´s main competitors. On one hand, as it´s shown in table 4, UVM is the one that has presence In 18 states in the country, while 3 of it´s main competitors have just presence in a single state (they are local universities). This shows how UVM has diversify and it might capture market and become a top performer in those states where education is not so concentrated. The second competitive advantage that UVM has, is that is the one that offers the highest number of “No Escolarizada” programs, and thinking in a long-term investment, this seems like a good characteristic because they offer flexibility and digitalization in this fast-paced years.

03 – UVM´s Competitive Landscape

Table #6. UMV´s & Competitors Number of Schools

INSTITUCIÓN_DE_EDUCACIÓN_SUPERIOR	ESCUELA
UNIVERSIDAD AUTÓNOMA DE SINALOA	69
BENEMÉRITA UNIVERSIDAD AUTÓNOMA DE PUEBLA	51
UNIVERSIDAD DEL VALLE DE MÉXICO	44
UNIVERSIDAD TECNOLÓGICA DE MÉXICO	11
UNIVERSIDAD ABIERTA Y A DISTANCIA DE MÉXICO	2

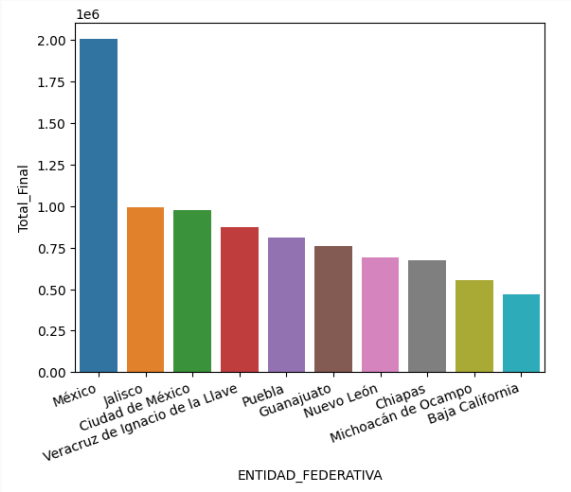
Table #7. UVM´s & competitors Programs

INSTITUCIÓN_DE_EDUCACIÓN_SUPERIOR	TIPO Licenciatura	Posgrado	Total
BENEMÉRITA UNIVERSIDAD AUTÓNOMA DE PUEBLA	139	133	272
UNIVERSIDAD DEL VALLE DE MÉXICO	161	90	251
UNIVERSIDAD AUTÓNOMA DE SINALOA	123	97	220
UNIVERSIDAD TECNOLÓGICA DE MÉXICO	92	44	136
UNIVERSIDAD ABIERTA Y A DISTANCIA DE MÉXICO	44	3	47

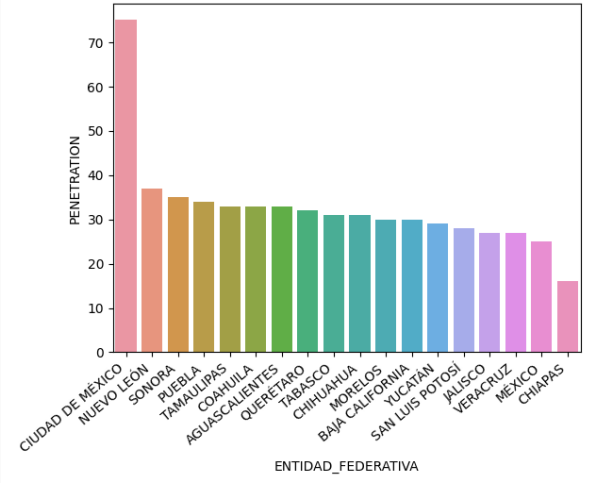
Comparing all the metrics for UVM and it´s competitors, we can say UVM is a middle perfomer, that is becoming one of the top performers in this group. UVM´s number of enrolled students has been growing during the last years, but the competitors have had more students during this time period. In spite of the number of enrolled students, the fact that the UVM has presence in 18 states, it is the second university with more programs in these group, it has the higher number of programs in the “No Escolarizada” modality, and it offers a wide range or graduate, and undergraduate programs gives the UVM a positive panorama that can make it become a top performer.

04 – Target Population – Undergraduates

Graph #10. Undergraduate population by State



Graph#11. Undergraduate Students – Market Penetration



In Mexico, the population between young adults of 18-24 years is about 14.7 million. The state with more undergraduate students/potential undergraduate students is Estado de Mexico, followed by Jalisco and Mexico City. As we saw in the previous graphs, Mexico City is the State with the greater number of students, and the market penetration in this state is the highest in all the country, showing a penetration of 75%. In the rest of the states where the asset is located, there´s still a great opportunity for market growth, for example Estado the Mexico and Jalisco are two states that can have an important market penetration increase, considering the total undergraduate population in those states.

05 – Conclusions & Recommendations

CONCLUSION

- **UVM´s Profile:** The asset has presence in 18 Mexican states and it´s a top performer in “No Escolarizada” modality
- **UVM´s Performance:** The asset has grown around 29% in the last 5 years; it seems it will keep growing at this rate
- **UVM´s Competitive Landscape:**
  - **Market size:** The market for graduate & undergraduate students is around 5 million, it has been growing in the last years
  - **UVM´s Competitive advantage:** the presence the asset has in the country, and the flexibility of having many ‘No Escolarizada’ programs
  - **Market Penetration:** There is a lot of opportunity to increase the market penetration outside Mexico City

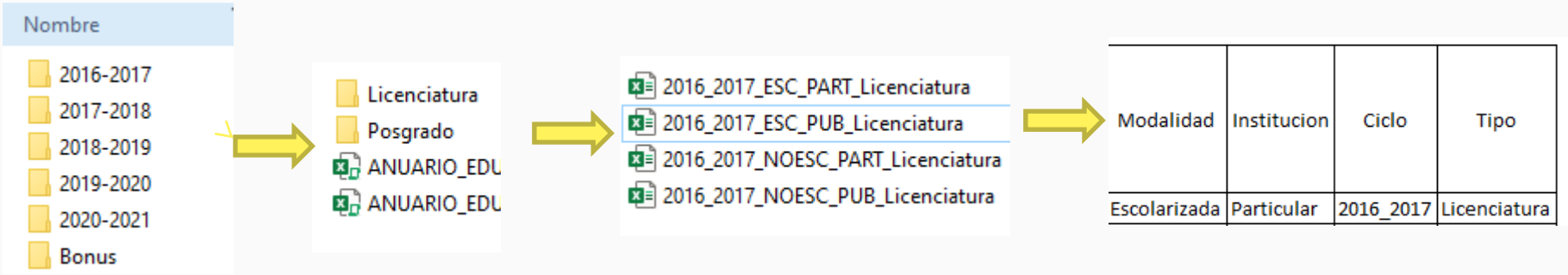
RECOMMENDATIONS

- For the reason mentioned above and reviewed along the analysis, the UVM is a middle performer that seem will become a top performer (vs it´s competitors), so it is an attractive asset to invest in
- Complement this analysis with an economic assessment, to understand if it is also feasible in this aspect

06- Annex – Data Processing and Analysis

In the following slides you can find the steps that where followed to process and analyze the data:

1. **Data Download –** the databases where downloaded form ANUIES, as stated in the challenge instructions. For each academic cycle, 8 files were downloaded (4 files for Graduate – one file for “Escolarizada + Publica”, one file for “Escolarizada + Particular” , one file for “No Escolarizada + Publica” and one file for “No Escolarizada + Particular” and 4 files for Undergraduate divided by the same variables). The colums of “Modalidad”, “Institucion”, “Ciclo” and “Tipo” where added manually to each file.



06-Annex – Data Processing and Analysis

2. Understanding the data structure – while reading the data in each file, it was noticable that in the cycles 2016-2017, 2017-2018 and 2018-2019 (Batch 1) the data had one structure while in the cycles 2019-2020 and 2020-2021 (Batch 2), the data had another one. Different scripts where created in python to give the same structure to each batch of files, to be able to merge all the files in one single file and analyse the general data base. Specific details about the data processing can be found in each python script.

Batch 1 – Script 1

To do´s:

1. Create and re-name the columns
2. Replace the NaN values with the corresponding information for each column
3. Delete the bottom text from each file
4. Unite all the files in one base

Batch 2 – Script 2

To do´s:

1. Create and re-name the columns
2. Delete the bottom text from each file
3. Unite all the files in one base

06- Annex – Data Processing and Analysis

3. Merge of Batch 1 and 2 Data – Once all the data was processed and cleaned, a single file was generated in python. For all the details and processing, each python script can be reviewd

DCEY-Batch1.ipynb

DCEY-Batch2.ipynb

4. Bonus questions– an additional script was created to answer the bonus questions

DCEY-Bonus.ipynb

For this question a principal database (created by the INEGI, available at https://www.inegi.org.mx/app/tabulados/interactivos/?pxq=Poblacion_Poblacion_01_e60cd8cf-927f-4b94-823e-972457a12d4b&idrt=123&opc=t) was used. The database was extracted with the following configuration

06-Annex – Data Processing and Analysis

As we can see, the data was already grouped by the INEGI, but we still needed the population from 18 and 19 years, that could be extracted from the grouped data of age range 15 to 19 years. To understand the distribution of the group an additional datasource was consulted: https://population.un.org/wpp/Download/Standard/Population/

ISO3 Alpha-code	ISO2 Alpha-code	SDMX code**	Type	Parent code	Year	16	17	18
MEX	MX	484	Country/Area	916	2017	2 207	2 188	2 165
MEX	MX	484	Country/Area	916	2018	2 199	2 190	2 172
MEX	MX	484	Country/Area	916	2019	2 194	2 186	2 175
MEX	MX	484	Country/Area	916	2020	2 187	2 187	2 178
MEX	MX	484	Country/Area	916	2021	2 174	2 179	2 177

The file was downloaded, and the distribution per age in Mexico was reviewd.
The number of people aged 15,16,17,18 and 19 was quite similar, so to get the 18 and 19 population, the INEGI´s data from the age range 15 to 19 years was divided into 5, multiplied by 2 and finally that value was added to the one of 20-24 years old for each mexican state

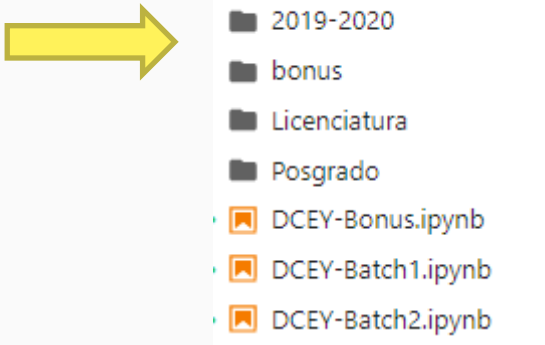
06-Annex – Data Processing and Analysis

5. Definitions– the definition of escolarizada and no escolarizada where obtained from the following WWW

- https://www.inegi.org.mx/sistemas/mapa/atlas/docs/Glosario%20Atlas.pdf
- https://suayed.iztacala.unam.mx/hrf_faq/diferencia-entre-sistema-escolarizado-y-sistema-de-universidad-abierta-y-educacion-distancia/

CONSIDERATIONS

- **The programs that had zero enrolled students were not considered for this analysis, so we could compre just "active programs" in each university**
- **To run the scripts, the following folders are needed. All this data (folders and scripts can be found in github)**
- **Just create a new file in python and then add all these**



Thanks!

Don´t hesitate to contacte me if you have any doubts

Renata Gómez Mendoza