FASE 1 : INTRODUCCION AL ANALISIS

World of warcraft es un MMORPG en el cual los jugadores pueden caracterizarse por razas y a la vez por clases. Puede personalizar su personaje para pelear contra otros jugadores o para realizar misiones del juego y subir de nivel de personaje o de honor con las distintas zonas. Cada una de estas zonas están diseñadas para conllevar distintos tipos de jugadores, desde los más novatos hasta los más avanzados en el juego. Este juego tiene muchos factores con los cuales se pueden generar diferentes análisis, ya sea, sobre la popularidad de las zonas, la media de jugadores por nivel, control de las zonas a lo largo del tiempo, cómo han cambiado las preferencias de zonas y actividades de los jugadores con diferentes versiones del juego, etc.

Ahora, nuestro equipo, con el DataSet entregado decidió hacer un análisis exhaustivo el cual se centre en el ámbito de las zonas, más específicamente, el equipo responderá la interrogante de : ¿Existen zonas donde el nivel de los jugadores es más homogéneo en comparación con otras zonas?, ¿Qué tipo de zonas (por ejemplo, mazmorras, ciudades, áreas PvP) son más populares?, ¿Hay zonas altamente disputadas entre facciones y cómo afecta esto al comportamiento de los jugadores?, ¿Los jugadores de niveles más bajos evitan zonas controladas por facciones opuestas o de nivel alto? . Descubrir si hay zonas con una población de niveles más homogénea nos puede dar pistas sobre las preferencias de los jugadores y cómo eligen moverse por el mundo del juego. Esto puede estar influenciado por el diseño de las zonas, el tipo de contenido disponible y las recompensas que se pueden obtener. En esta primera fase de nuestro análisis CRISP-DM, vamos a sumergirnos en los datos para detectar cómo se distribuyen los niveles de los jugadores en diferentes zonas. Este análisis nos ayudará a encontrar patrones y a entender cómo la uniformidad de niveles varía de una zona a otra, lo cual puede ser crucial para futuras decisiones de diseño y ajuste dentro del juego.

FASE 2 : EXPLORACIÓN DE LOS DATOS

```python
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.graph_objects as go
from scipy import stats
import numpy as np
import plotly.express as px

zones = pd.read_csv('../data/01_raw/zones.csv')
wowah_data = pd.read_csv('../data/01_raw/wowah_data.csv')
locations = pd.read_csv('../data/01_raw/locations.csv')
```

Debido a problemas con la escrituras del dataframe fuente de wowah_data vamos a ejecutar una linea con la cuál eliminas los espacios.

```python
wowah_data.columns = wowah_data.columns.str.strip()
```

Para comenzar con el análisis exploratorio, es esencial identificar y comprender la información contenida en cada uno de los datasets que vamos a utilizar. A continuación, se presenta un resumen de los tres principales datasets involucrados en nuestro estudio.

```
zones.head(8)

wowah_data.head(8)

locations.head(8)
```

```
    Map_ID Location_Type                         Location_Name
Game_Version
0        0     Continent                       Eastern Kingdoms
WoW
1        1     Continent                              Kalimdor
WoW
2      530     Continent                              Outlands
TBC
3      571     Continent                             Northrend
WLK
4      646     Continent                             Deepholm
CAT
5      732     Continent                             Tol Barad
CAT
6      870     Continent                             Pandaria
MoP
7     1064     Continent  Mogu Island Daily Area (Isle of Thunder)
MoP
```

Al analizar estos tres datasets, buscamos identificar patrones en la distribución de los niveles de los jugadores a través de diferentes zonas, entender cómo las características de las zonas afectan esta distribución y explorar cómo los mapas y sus versiones juegan un papel en la experiencia del juego. Este enfoque nos permitirá obtener una visión integral de cómo los jugadores interactúan con el mundo de World of Warcraft y cómo se pueden ajustar las zonas y los mapas para mejorar el juego.

es útil saber qué tipo de datos tenemos en cada uno de los datasets. Esto nos ayuda a entender cómo podemos trabajar con la información. A continuacion mostraremos los diferente tipos de datos de cada uno de los datasets:

```
zones.dtypes
```

```
Zone_Name        object
Continent        object
Area             object
Zone             object
Subzone          object
Type             object
Size            float64
```

```
Controlled        object
Min_req_level      int64
Min_rec_level    float64
Max_rec_level    float64
Min_bot_level    float64
Max_bot_level    float64
dtype: object

wowah_data.dtypes



char          int64
level         int64
race         object
charclass    object
zone         object
guild         int64
timestamp    object
dtype: object

locations.dtypes



Map_ID            int64
Location_Type    object
Location_Name    object
Game_Version     object
dtype: object
```

Para entender mejor los datos numéricos en nuestro dataset zones, usamos .describe(). Este comando nos da un vistazo rápido a cómo se distribuyen los números en las columnas del dataset:

```
zones.describe()



            Size    Min_req_level   Min_rec_level   Max_rec_level
Min_bot_level  \
count   68.000000       160.000000      159.000000      159.000000
158.000000
mean    11.544118        22.975000       39.981132       61.918239
40.518987
std     10.935952        29.272511       28.165980       27.350276
28.128622
min      5.000000         1.000000        0.000000        0.000000
```

```
1.000000
25%        5.000000         1.000000         10.000000         42.000000
10.000000
50%        5.000000         1.000000         45.000000         70.000000
46.000000
75%       16.250000        57.250000         67.000000         80.000000
68.000000
max       40.000000        80.000000         80.000000        100.000000
80.000000

        Max_bot_level
count      158.000000
mean        61.974684
std         26.861036
min          0.000000
25%         40.750000
50%         70.000000
75%         80.000000
max        100.000000
```

zones.describe().T

```
                count       mean        std   min     25%    50%    75%
max
Size             68.0  11.544118  10.935952   5.0    5.00    5.0  16.25
40.0
Min_req_level   160.0  22.975000  29.272511   1.0    1.00    1.0  57.25
80.0
Min_rec_level   159.0  39.981132  28.165980   0.0   10.00   45.0  67.00
80.0
Max_rec_level   159.0  61.918239  27.350276   0.0   42.00   70.0  80.00
100.0
Min_bot_level   158.0  40.518987  28.128622   1.0   10.00   46.0  68.00
80.0
Max_bot_level   158.0  61.974684  26.861036   0.0   40.75   70.0  80.00
100.0
```

zones.isna().sum()

```
Zone_Name           0
Continent           0
Area                3
Zone                7
Subzone           108
Type                0
```

```
Size              92
Controlled         0
Min_req_level      0
Min_rec_level      1
Max_rec_level      1
Min_bot_level      2
Max_bot_level      2
dtype: int64
```

Al ver siguiente analisis de datos nos damos que hay columnas con datos faltantes.

```python
filas, columnas = zones.shape
filas , columnas
```

```
(160, 13)
```

A continuación, exploraremos cuáles son las clases más jugadas en World of Warcraft.
Identificar las clases más populares nos ayudará a comprender mejor las preferencias de los
jugadores y cómo se distribuyen entre las diferentes opciones disponibles en el juego.

```python
# Datos de las clases
class_counts = wowah_data['charclass'].value_counts()

# Colores para cada clase
colors = {
    'Druid': '#FF7D0A',   # Naranja
    'Hunter': '#ABD473',  # Verde
    'Mage': '#69CCF0',    # Azul claro
    'Paladin': '#F58CBA', # Rosa
    'Priest': '#FFFFFF',  # Blanco
    'Rogue': '#FFF569',   # Amarillo
    'Shaman': '#0070DE',  # Azul
    'Warlock': '#9482C9', # Morado
    'Warrior': '#C79C6E'  # Marrón claro
}

# Crear gráfico de torta
fig = go.Figure(data=[go.Pie(
    labels=class_counts.index,
    values=class_counts,
    marker=dict(
        colors=[colors.get(clase, '#000000') for clase in
class_counts.index]
    ),
    textinfo='label+percent',
    insidetextorientation='radial',
    hole=0.3
```

```python
)])

# Actualizar el diseño
fig.update_layout(
    title_text='Distribución de Personajes por Clase',
    title_font_size=24,
    title_x=0.5,
    title_y=0.95,
    legend_title_text='Clase',
    legend=dict(
        x=1.05,
        y=0.5,
        traceorder='normal',
        orientation='v'
    ),
    margin=dict(l=0, r=150, t=50, b=0),
    width=800,
    height=600,
    annotations=[dict(
        text='Distribución de<br>Personajes',
        x=0.5,
        y=0.5,
        font_size=20,
        showarrow=False
    )]
)

fig.show()
```

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```

```
class_counts = wowah_data['charclass'].value_counts()
class_counts
```

```
charclass
Hunter     155891
Mage       151202
Warlock    138181
Warrior    124262
Priest     116138
Rogue      108818
Paladin    108734
Druid       80061
Shaman      65288
Name: count, dtype: int64
```

Ya que el enfoque principal de nuestro analisis se basa nada mas en las dos primeras versiones del juego debido a la imnensa cantidad de datos nos gustaria dividir los numeros de jugadores totales asi que filtraremos solamente a la poblacion que jugo esas versiones de juego.

```
filtered_locations_wow = locations[locations['Game_Version'] == 'WoW']
filtered_locations_tbc = locations[locations['Game_Version'] == 'TBC']

filtered_wowah_data_wow =
```

```python
wowah_data[wowah_data['zone'].isin(filtered_locations_wow['Location_Na
me'])]
filtered_wowah_data_tbc =
wowah_data[wowah_data['zone'].isin(filtered_locations_tbc['Location_Na
me'])]

merged_filtered_data_wow = pd.merge(filtered_wowah_data_wow,
filtered_locations_wow, left_on='zone', right_on='Location_Name',
how='left')
merged_filtered_data_tbc = pd.merge(filtered_wowah_data_tbc,
filtered_locations_tbc, left_on='zone', right_on='Location_Name',
how='left')

expansion_counts = {
    'WoW': len(merged_filtered_data_wow),
    'TBC': len(merged_filtered_data_tbc)
}

fig = go.Figure(data=[go.Bar(
    x=list(expansion_counts.keys()),
    y=list(expansion_counts.values()),
    marker_color=['yellow', 'green'],  # Colores para cada expansión
    text=[f'{count}' for count in expansion_counts.values()],
    textposition='auto'
)])

fig.update_layout(
    title='Número de Jugadores por Expansión (WoW vs TBC)',
    xaxis_title='Expansión',
    yaxis_title='Número de Jugadores',
    xaxis=dict(tickvals=[0, 1], ticktext=['WoW', 'TBC']),
    yaxis=dict(showgrid=True, gridcolor='rgba(0,0,0,0.1)',
gridwidth=1),
    margin=dict(l=40, r=40, t=40, b=40)
)

fig.show()
```

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Para la exploracion de datos nos gustaria igualmente analizar el numero de jugadores por zona para asi tener una idea de como va a ser nuestra hipotesis principalmente.

```python
# Contar el número de personajes en cada zona
zone_counts = wowah_data['zone'].value_counts().reset_index()
zone_counts.columns = ['zone', 'count']

# Crear gráfico de barras con Plotly
fig = px.bar(
    zone_counts,
    x='zone',
    y='count',
    title='Número de Personajes por Zona',
    labels={'zone': 'Zona', 'count': 'Número de Personajes'},
    height=600,
    width=1000
)
```

```python
# Actualizar diseño para mejorar la visualización
fig.update_layout(
    xaxis_title='Zona',
    yaxis_title='Número de Personajes',
    xaxis=dict(tickangle=-45),  # Girar las etiquetas del eje x para
mejor lectura
    margin=dict(l=40, r=40, t=40, b=100)  # Ajustar los márgenes para
una mejor presentación
)

fig.show()
```

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Foothills","Durotar","Tanaris","Auchindoun: Shadow Labyrinth","Eye of
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Needles","Thunder Bluff","Mana-Tombs","Tirisfal Glades","Arathi
Highlands","The Botanica","Ashenvale","The
Hinterlands","Mulgore","Silvermoon City","Feralas","Hellfire
Ramparts","Felwood","Stonetalon Mountains","The Underbog","Un'Goro
Crater","The Arcatraz","Winterspring","Deadwind Pass","Sethekk
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este gráfico proporciona una visión general útil para entender cómo se distribuyen los jugadores en diferentes zonas y puede servir como base para explorar más a fondo las razones detrás de estas tendencias.

```python
# Filtrar por expansiones (WoW y TBC)
filtered_wowah_data_wow =
wowah_data[wowah_data['zone'].isin(locations[locations['Game_Version']
== 'WoW']['Location_Name'])]
filtered_wowah_data_tbc =
wowah_data[wowah_data['zone'].isin(locations[locations['Game_Version']
== 'TBC']['Location_Name'])]

# Contar jugadores por expansión y zona
expansion_zone_counts = pd.concat([
    filtered_wowah_data_wow.assign(Expansion='WoW'),
    filtered_wowah_data_tbc.assign(Expansion='TBC')
])

# Contar jugadores por zona y expansión
zone_expansion_counts = expansion_zone_counts.groupby(['zone',
'Expansion']).size().reset_index(name='count')

# Crear gráfico de barras
fig = px.bar(zone_expansion_counts, x='zone', y='count',
color='Expansion',
            title='Número de Jugadores por Zona y Expansión',
            labels={'zone': 'Zona', 'count': 'Número de Jugadores'})
fig.update_layout(xaxis_title='Zona', yaxis_title='Número de
Jugadores', xaxis_tickangle=-45)
fig.show()
```

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El gráfico de barras que presentamos muestra la distribución del número de jugadores en las distintas zonas, diferenciadas por expansión. Este análisis nos permite comparar la popularidad de las zonas entre WoW y TBC, proporcionando información sobre cómo la población de

jugadores varía en función de la expansión y ayudando a entender las preferencias de los jugadores en diferentes versiones del juego.

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['level'].std().reset_index()

fig = go.Figure(data=[go.Bar(x=std_dev_by_zone['zone'],
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fig.show()
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Steppes","Coilfang: The Slave Pens","Darkshore","Deadmines","Deadwind
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Plaguelands","Elwynn Forest","Eversong Woods","Eye of the
Storm","Felwood","Feralas","Gates of
Ahn'Qiraj","Ghostlands","Gnomeregan","Gruul's Lair","Hall of
Legends","Hellfire Peninsula","Hellfire Ramparts","Hillsbrad
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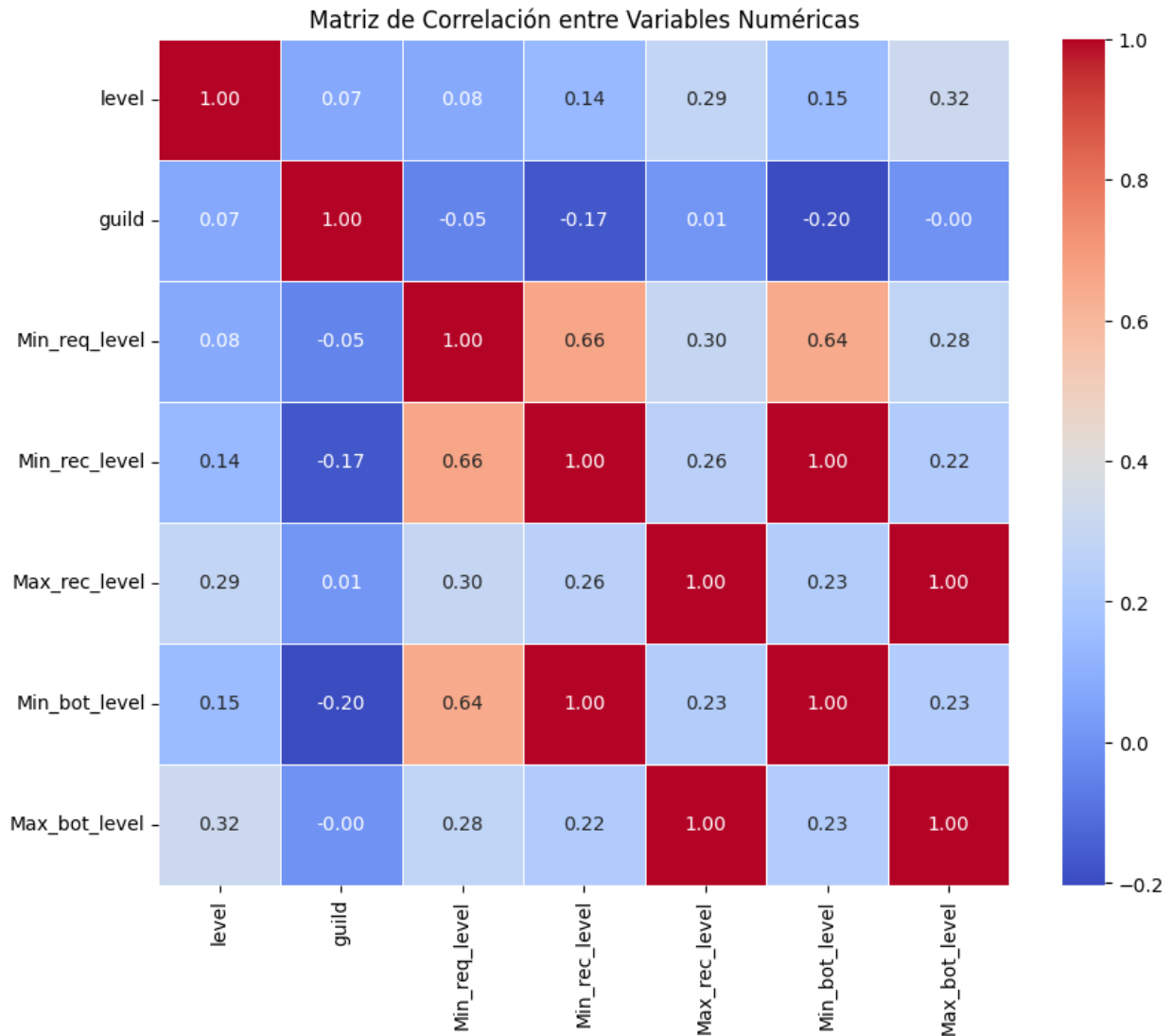{"gridcolor":"white","linecolor":"white","ticks":""},"bgcolor":"#E5ECF

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Nivel"},"type":"linear"}}}
```

El gráfico de barras que presentamos muestra la desviación estándar de los niveles de los jugadores en cada zona. Este análisis nos permite ver cuán homogéneos o variados son los niveles de los jugadores en diferentes zonas. Las zonas con una baja desviación estándar tienen niveles más uniformes, mientras que aquellas con una alta desviación estándar muestran una mayor diversidad de niveles. Esto nos ayuda a entender mejor la distribución de los niveles en el juego y cómo varía la experiencia de los jugadores según la zona.

```python
data_combined = pd.concat([wowah_data[['level', 'guild']],
                           zones[['Min_req_level', 'Min_rec_level',
'Max_rec_level', 'Min_bot_level', 'Max_bot_level']]],
                          axis=1)

correlation_matrix = data_combined.corr()

plt.figure(figsize=(10, 8))
sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm',
fmt=".2f", linewidths=0.5)
plt.title("Matriz de Correlación entre Variables Numéricas")
plt.show()
```

Matriz de Correlación entre Variables Numéricas

Al observar la matriz de correlación, podemos identificar relaciones clave entre variables numéricas importantes, como los niveles de los jugadores y las zonas en las que se encuentran. Por ejemplo, una correlación moderada entre el nivel de los personajes y el nivel máximo recomendado de la zona podría indicar que los jugadores tienden a seguir las recomendaciones del juego en cuanto a dónde deberían estar. Por otro lado, correlaciones más bajas en otras áreas podrían sugerir que algunos jugadores se aventuran en zonas fuera de su nivel recomendado, lo que refleja una mayor flexibilidad en el estilo de juego y exploración del mundo.

FASE 3 : PREPARACIÓN DE LOS DATOS

Ahora prodeceremos a configurar y perfeccionar los DataSet para nuestra conveniensia y asi llegar a la solucion con datos limpios y significativos. Primero rellenamos los valores nulos del archivo zones Segundo normalizamos los numeros del archivos zones Tercero normalizamos los numeros del archivos wowah_data Cuarto quitamos los espacios Quinto recortamos los outliners de wowah_data con niveles menores a 3

```python
diccionario =
{'Subzone':'None','Size':0,'Area':'None','Zone':'None','Min_rec_level'
:0,'Max_rec_level':0,'Min_bot_level':0,'Max_bot_level':0, }
zones = zones.fillna(diccionario)

zones['Min_rec_level'] = zones['Min_rec_level'].astype(int)
zones['Max_rec_level'] = zones['Max_rec_level'].astype(int)
zones['Min_bot_level'] = zones['Min_bot_level'].astype(int)
zones['Max_bot_level'] = zones['Max_bot_level'].astype(int)

wowah_data['guild'] = wowah_data['guild'].replace(-1, 0)

wowah_data.columns = wowah_data.columns.str.strip()

z = np.abs(stats.zscore(wowah_data['level']))
wowah_data = wowah_data[( z < 3 )]
wowah_data
```

```
           char   level     race charclass                  zone  guild  \
1          65494      9      Orc   Hunter               Durotar      0
2          65325     14      Orc  Warrior            Ghostlands      0
3          65490     18      Orc   Hunter            Ghostlands      0
4           2288     60      Orc   Hunter   Hellfire Peninsula      0
5           2289     60      Orc   Hunter   Hellfire Peninsula      0
...          ...    ...      ...      ...                   ...    ...
1048570     1094     70   Undead    Rogue          Arathi Basin    103
1048571    22703     70   Undead  Warlock              Orgrimmar    103
1048572    33016     70   Undead  Warlock              Orgrimmar    204
1048573     8245     70   Undead  Warlock     Shadowmoon Valley     19
1048574     2416     70   Undead  Warlock               Nagrand    204

                   timestamp
1          01/01/08 00:02:04
2          01/01/08 00:02:04
3          01/01/08 00:02:04
4          01/01/08 00:02:09
5          01/01/08 00:02:09
...                      ...
1048570    01/26/08 08:11:58
1048571    01/26/08 08:12:03
1048572    01/26/08 08:12:03
1048573    01/26/08 08:12:03
1048574    01/26/08 08:12:03

[1026942 rows x 7 columns]
```

Ahora procedemo a recortar los datos aun mas, sacamos los outliers de los DataFrames (wowah_data y zones) con la puntuación IQR y comparamos con el antes y los nuevos datos mas significativos.

```
wowah_data_antes = wowah_data
wowah_data_antes.shape
```

```
(1026942, 7)
```

```
Q1 = wowah_data['level'].quantile(0.25)
Q3 = wowah_data['level'].quantile(0.75)
IQR = Q3 - Q1
wowah_data = wowah_data[~((wowah_data['level'] < (Q1 - 1.5 * IQR ))|
(wowah_data['level'] > (Q3 + 1.5 * IQR )))]
wowah_data.shape
```

```
(842445, 7)
```

```
zones_antes = zones
zones_antes.shape
```

```
(160, 13)
```

```
Q1 = zones['Min_rec_level'].quantile(0.25)
Q3 = zones['Min_rec_level'].quantile(0.75)
IQR = Q3 - Q1
zones = zones[~((zones['Min_rec_level'] < (Q1 - 1.5 * IQR ))|
(zones['Min_rec_level'] > (Q3 + 1.5 * IQR )))]
zones.shape
```

```
(160, 13)
```