Clash Royale API Tutorial

Introduzione

Clash Royale è un videogioco strategico del 2016, sviluppato e pubblicato da Supercell per sistemi iOS e Android.

Accesso all'API

Clash Royale mette a disposizione le API per gli sviluppatori, tramite un servizio di autenticazione con Token Dinamici. Per sfruttare tali API è necessario possedere un account Clash Royale API. Se non si dispone di un account, allora:

```
- Recarsi sulla pagina  Clash Royale Developer API;
- Cliccare in alto a destra su registrati;
- Compilare il form di registrazione;
- Confermare la registrazione tramite email;
```

Una volta ottenuto l'account, bisogna recarsi su MyAccount, per creare un Token di autenticazione inserendo:

```
- Nome (da dare al token);
- Descrizione (dove si inserirà una breve descrizione di quello che si vorrà fare con il token);
- IP Address (l'indirizzo IP locale con cui si è collegati in quel momento);
```

Attenzione però che nel caso in cui l'indirizzo IP del dispositivo dovesse cambiare il token non funzionerà più. Quindi i permessi ci verrebbero negati e bisognerebbe creare un nuovo Token inserendo l'indirizzo di quel momento.

Acquisizione dati sui Clan

In [1]:
```python
import requests
```

Il token è dinamico per cui lo si genera tramite il sito Clash Royale API, come precedentemente mostrato e lo si inserisce manualmente.

In [2]:
```python
TOKEN = "eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzUxMiIsImtpZCI6IjI4YTMxOGY3LTAwMDAtYTFlYi03ZmExLTJjNzQzM2M2Y2NhNSJ9.eyJpc3N
```

In [3]:
```python
headers = {"Authorization": f"Bearer {TOKEN}"}
```

Tramite qusta chiamata CURL si ricercano tutti i clan con nome uguale o simile a "Dark Unicorns".

In [4]:
```python
response = requests.get("https://api.clashroyale.com/v1/clans?name=Dark%20unicorns", headers = headers)
```

In [5]:
```python
containers = response.json()
```

In [6]:
```python
oggetti = containers['items']
```

In [7]:
```python
clans = []
i = 0
for buffer in oggetti:
    tag = buffer['tag']
    name = buffer['name']
    clanScore = buffer['clanScore']
    clans.append([tag, name, clanScore])
    i += 1
```

In [8]:
```python
import pandas as pd
dataFrame_clans = pd.DataFrame(clans, columns=['tag', 'name', 'clanScore'])
```

In questo primo dataFrame sono prensenti i clan risultanti dalla ricerca tramite CURL.

```
In [9]:    print(dataFrame_clans.info())
           dataFrame_clans.head()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 960 entries, 0 to 959
Data columns (total 3 columns):
 #   Column      Non-Null Count  Dtype
---  ------      --------------  -----
 0   tag         960 non-null    object
 1   name        960 non-null    object
 2   clanScore   960 non-null    int64
dtypes: int64(1), object(2)
memory usage: 22.6+ KB
None
```

Out[9]:

	tag	name	clanScore
0	#9LCV00CR	Dark Unicorns	57739
1	#P0U00VCC	Dark Unicorns	20106
2	#82Y0YLY0	dark unicorns	13467
3	#2UQQUYUG	Dark Unicorns	10083
4	#CVYLJUG	Dark Unicorns	20559

ANALISI MEMBRI DEL CLAN

Basandoci sul dataFrame precedente andremo a estrapolare i tag dei giocatori e tramite l'opportuna chiamata CURL prenderemo i dati su di essi. Prima di fare questo però scegliamo uno specifico clan.

```
In [10]:   tagclan = dataFrame_clans['tag'][0]
           tagclan = tagclan[1:]
```

Per selezionare un clan specifico bisogna estrarre dal dataFrame il 'tag' del clan, e dopo aver eliminato la presenza del cancelletto '#', con le due righe di codice sopra scritte, lo inseriamo alla fine della chiamata CURL con il comando format.

```
In [11]:   urlclans = "https://api.clashroyale.com/v1/clans/%23{}/members".format(tagclan)
```

```
In [12]:   clan = requests.get(urlclans, headers = headers)
           print(clan.json())
```

{'items': [{'tag': '#C8J9QQP', 'name': '⋆ マッテオ_Hele✐ ♦ ', 'role': 'leader', 'lastSeen': '20211111T145553.000Z', 'expLevel': 14, 'trophies': 6153, 'arena': {'id': 54000015, 'name': 'Master I'}, 'clanRank': 1, 'previousClanRank': 1, 'donations': 400, 'donationsReceived': 330, 'clanChestPoints': 0}, {'tag': '#8GJUCG0VL', 'name': 'sfa', 'role': 'elder', 'lastSeen': '20211111T091817.000Z', 'expLevel': 14, 'trophies': 6071, 'arena': {'id': 54000015, 'name': 'Master I'}, 'clanRank': 2, 'previousClanRank': 3, 'donations': 256, 'donationsReceived': 240, 'clanChestPoints': 0}, {'tag': '#2J2Q88VQ', 'name': 'Devil', 'role': 'coLeader', 'lastSeen': '20211111T140750.000Z', 'expLevel': 14, 'trophies': 6038, 'arena': {'id': 54000015, 'name': 'Master I'}, 'clanRank': 3, 'previousClanRank': 2, 'donations': 655, 'donationsReceived': 360, 'clanChestPoints': 0}, {'tag': '#22JPPY20Q', 'name': 'Giskard', 'role': 'elder', 'lastSeen': '20211111T125127.000Z', 'expLevel': 14, 'trophies': 6015, 'arena': {'id': 54000015, 'name': 'Master I'}, 'clanRank': 4, 'previousClanRank': 5, 'donations': 6, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#8CVQRU08P', 'name': 'luca9398', 'role': 'elder', 'lastSeen': '20211111T134041.000Z', 'expLevel': 14, 'trophies': 6000, 'arena': {'id': 54000015, 'name': 'Master I'}, 'clanRank': 5, 'previousClanRank': 6, 'donations': 230, 'donationsReceived': 400, 'clanChestPoints': 0}, {'tag': '#P8GVQC0GQ', 'name': 'io', 'role': 'elder', 'lastSeen': '20211111T144733.000Z', 'expLevel': 14, 'trophies': 5980, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 6, 'previousClanRank': 4, 'donations': 454, 'donationsReceived': 440, 'clanChestPoints': 0}, {'tag': '#P0JCJC28', 'name': 'CloacaLavica', 'role': 'elder', 'lastSeen': '20211111T143819.000Z', 'expLevel': 14, 'trophies': 5962, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 7, 'previousClanRank': 8, 'donations': 359, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#P990980P', 'name': 'angelo', 'role': 'coLeader', 'lastSeen': '20211111T145802.000Z', 'expLevel': 14, 'trophies': 5912, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 8, 'previousClanRank': 11, 'donations': 448, 'donationsReceived': 400, 'clanChestPoints': 0}, {'tag': '#28VRP0PV', 'name': 'camiciabottoni', 'role': 'elder', 'lastSeen': '20211111T132531.000Z', 'expLevel': 14, 'trophies': 5875, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 9, 'previousClanRank': 14, 'donations': 266, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#Y2CRLQ0CP', 'name': 'LOR €', 'role': 'coLeader', 'lastSeen': '20211111T091403.000Z', 'expLevel': 14, 'trophies': 5834, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 10, 'previousClanRank': 9, 'donations': 341, 'donationsReceived': 240, 'clanChestPoints': 0}, {'tag': '#2Q92J2L8G', 'name': 'illevor49', 'role': 'elder', 'lastSeen': '20211111T145658.000Z', 'expLevel': 14, 'trophies': 5828, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 11, 'previousClanRank': 7, 'donations': 19, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#29QPV2LP2', 'name': 'Luca04', 'role': 'member', 'lastSeen': '20211111T120406.000Z', 'expLevel': 13, 'trophies': 5801, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 12, 'previousClanRank': 10, 'donations': 517, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#2088GCGG', 'name': 'pippobaudo', 'role': 'member', 'lastSeen': '20211110T225233.000Z', 'expLevel': 14, 'trophies': 5787, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'cla

nRank': 13, 'previousClanRank': 12, 'donations': 78, 'donationsReceived': 200, 'clanChestPoints': 0}, {'tag': '#QLQ9VR0R0', 'name': 'BleEzE', 'role': 'elder', 'lastSeen': '20211111T110037.000Z', 'expLevel': 14, 'trophies': 5776, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 14, 'previousClanRank': 13, 'donations': 2, 'donationsReceived': 120, 'clanChestPoints': 0}, {'tag': '#2LUC2QVC', 'name': 'Tatanka', 'role': 'elder', 'lastSeen': '20211111T120727.000Z', 'expLevel': 14, 'trophies': 5756, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 15, 'previousClanRank': 15, 'donations': 18, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#QJLVQ80LL', 'name': 'arruso', 'role': 'elder', 'lastSeen': '20211111T090820.000Z', 'expLevel': 13, 'trophies': 5734, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 16, 'previousClanRank': 19, 'donations': 415, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#PQV20Q', 'name': 'flybeard', 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'20211111T124557.000Z', 'expLevel': 14, 'trophies': 5395, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 41, 'previousClanRank': 37, 'donations': 394, 'donationsReceived': 120, 'clanChestPoints': 0}, {'tag': '#82QJ8JCQ8', 'name': 'texo turi', 'role': 'member', 'lastSeen': '20211111T122948.000Z', 'expLevel': 13, 'trophies': 5385, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 42, 'previousClanRank': 41, 'donations': 442, 'donationsReceived': 240, 'clanChestPoints': 0}, {'tag': '#Y9VRQ8UG2', 'name': 'Murrinho', 'role': 'member', 'lastSeen': '20211111T134205.000Z', 'expLevel': 11, 'trophies': 5334, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 43, 'previousClanRank': 39, 'donations': 364, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#2PJ99YC2', 'name': 'rickyeroby2001', 'role': 'member', 'lastSeen': '20211111T140604.000Z', 'expLevel': 12, 'trophies': 5328, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 44, 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Seen': '20211111T133432.000Z', 'expLevel': 12, 'trophies': 5263, 'arena': {'id': 54000012, 'name': 'Legendary Arena'}, 'clanRank': 46, 'previousClanRank': 45, 'donations': 272, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#RQLRURLLQ', 'name': 'IlProcione', 'role': 'member', 'lastSeen': '20211111T133258.000Z', 'expLevel': 11, 'trophies': 5244, 'arena': {'id': 54000012, 'name': 'Legendary Arena'}, 'clanRank': 47, 'previousClanRank': 47, 'donations': 531, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#9VJGJ0YCL', 'name': 'DarKnight', 'role': 'member', 'lastSeen': '20211111T142719.000Z', 'expLevel': 12, 'trophies': 5220, 'arena': {'id': 54000012, 'name': 'Legendary Arena'}, 'clanRank': 48, 'previousClanRank': 46, 'donations': 56, 'donationsReceived': 320, 'clanChestPoints': 0}], 'paging': {'cursors': {}}}}

La request restituita è una Directory quindi per poter estrapolare le informazioni a noi utili preleviamo gli elementi contenuti all'interno di 'Items'.

In [13]:
```python
Players = clan.json()['items']
print(Players)
```

[{'tag': '#C8J9QQP', 'name': '✭ マッテオ_Hele✐ ♦ ', 'role': 'leader', 'lastSeen': '20211111T145553.000Z', 'expLevel': 14, 'trophies': 6153, 'arena': {'id': 54000015, 'name': 'Master I'}, 'clanRank': 1, 'previousClanRank': 1, 'donations': 400, 'donationsReceived': 330, 'clanChestPoints': 0}, {'tag': '#8GJUCG0VL', 'name': 'sfa', 'role': 'elder', 'lastSeen': '20211111T091817.000Z', 'expLevel': 14, 'trophies': 6071, 'arena': {'id': 54000015, 'name': 'Master I'}, 'clanRank': 2, 'previousClanRank': 3, 'donations': 256, 'donationsReceived': 240, 'clanChestPoints': 0}, {'tag': '#2J2Q88VQ', 'name': 'Devil', 'role': 'coLeader', 'lastSeen': '20211111T140750.000Z', 'expLevel': 14, 'trophies': 6038, 'arena': {'id': 54000015, 'name': 'Master I'}, 'clanRank': 3, 'previousClanRank': 2, 'donations': 655, 'donationsReceived': 360, 'clanChestPoints': 0}, {'tag': '#22JPPY20Q', 'name': 'Giskard', 'role': 'elder', 'lastSeen': '20211111T125127.000Z', 'expLevel': 14, 'trophies': 6015, 'arena': {'id': 54000015, 'name': 'Master I'}, 'clanRank': 4, 'previousClanRank': 5, 'donations': 6, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#8CVQRU08P', 'name': 'luca9398', 'role': 'elder', 'lastSeen': '20211111T134041.000Z', 'expLevel': 14, 'trophies': 6000, 'arena': {'id': 54000015, 'name': 'Master I'}, 'clanRank': 5, 'previousClanRank': 6, 'donations': 230, 'donationsReceived': 400, 'clanChestPoints': 0}, {'tag': '#P8GVQC0GQ', 'name': 'io', 'role': 'elder', 'lastSeen': '20211111T144733.000Z', 'expLevel': 14, 'trophies': 5980, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 6, 'previousClanRank': 4, 'donations': 454, 'donationsReceived': 440, 'clanChestPoints': 0}, {'tag': '#P0JCJC28', 'name': 'CloacaLavica', 'role': 'elder', 'lastSeen': '20211111T143819.000Z', 'expLevel': 14, 'trophies': 5962, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 7, 'previousClanRank': 8, 'donations': 359, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#P990980P', 'name': 'angelo', 'role': 'coLeader', 'lastSeen': '20211111T145802.000Z', 'expLevel': 14, 'trophies': 5912, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 8, 'previousClanRank': 11, 'donations': 448, 'donationsReceived': 400, 'clanChestPoints': 0}, {'tag': '#28VRP0PV', 'name': 'camiciabottoni', 'role': 'elder', 'lastSeen': '20211111T132531.000Z', 'expLevel': 14, 'trophies': 5875, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 9, 'previousClanRank': 14, 'donations': 266, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#Y2CRLQ0CP', 'name': 'LOR€', 'role': 'coLeader', 'lastSeen': '20211111T091403.000Z', 'expLevel': 14, 'trophies': 5834, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 10, 'previousClanRank': 9, 'donations': 341, 'donationsReceived': 240, 'clanChestPoints': 0}, {'tag': '#2Q92J2L8G', 'name': 'illevor49', 'role': 'elder', 'lastSeen': '20211111T145658.000Z', 'expLevel': 14, 'trophies': 5828, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 11, 'previousClanRank': 7, 'donations': 19, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#29QPV2LP2', 'name': 'Luca04', 'role': 'member', 'lastSeen': '20211111T120406.000Z', 'expLevel': 13, 'trophies': 5801, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 12, 'previousClanRank': 10, 'donations': 517, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#2088GCGG', 'name': 'pippobaudo', 'role': 'member', 'lastSeen': '20211110T225233.000Z', 'expLevel': 14, 'trophies': 5787, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 13, 'previousClanRank': 12, 'donations': 78, 'donationsReceived': 200, 'clanChestPoints': 0}, {'tag': '#QLQ9VR0R0', 'name': 'BleEzE', 'role': 'elder', 'lastSeen': '20211111T110037.000Z', 'expLevel': 14, 'trophies': 5776, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 14, 'previousClanRank': 13, 'donations': 2, 'donationsReceived': 120, 'clanChestPoints': 0}, {'tag': '#2LUC2QVC', 'name': 'Tatanka', 'role': 'elder', 'lastSeen': '20211111T120727.000Z', 'expLevel': 14, 'trophies': 5756, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 15, 'previousClanRank': 15, 'donations': 18, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#QJLVQ80LL', 'name': 'arruso', 'role': 'elder', 'lastSeen': '20211111T090820.000Z', 'expLevel': 13, 'trophies': 5734, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 16, 'previousClanRank': 19, 'donations': 415, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#PQV20Q', 'name': 'flybeard', 'role': 'coLeader', 'lastSeen': '20211111T135329.000Z', 'expLevel': 14, 'trophies': 5722, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 17, 'previousClanRank': 16, 'donations': 383, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#22CPRJ9YU', 'name': 'fede.paga', 'role': 'member', 'lastSeen': '20211111T141154.000Z', 'expLevel': 14, 'trophies': 5717, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 18, 'previousClanRank': 18, 'donations': 652, 'donationsReceived': 440, 'clanChestPoints': 0}, {'tag': '#UJ9PRLR', 'name': 'CALL3RINHO 07', 'role': 'member', 'lastSeen': '20211111T125240.000Z', 'expLevel': 13, 'trophies': 5685, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 19, 'previousClanRank': 17, 'donations': 325, 'donationsReceived': 400, 'clanChestPoints': 0}, {'tag': '#8JYCG28J8', 'name': 'Sergio', 'role': 'member', 'lastSeen': '20211111T122225.000Z', 'expLevel': 13, 'trophies': 5681, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 20, 'previousClanRank': 22, 'donations': 0, 'donationsReceived': 160, 'clanChestPoints': 0}, {'tag': '#8VL2VRJLJ', 'name': 'HASSECO', 'role': 'elder', 'lastSeen': '20211111T144038.000Z', 'expLevel': 14, 'trophies': 5627, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 21, 'previousClanRank': 20, 'donations': 261, 'donationsReceived': 400, 'clanChestPoints': 0}, {'tag': '#P80RLUP8J', 'name': 'Pyppone', 'role': 'member', 'lastSeen': '20211111T112617.000Z', 'expLevel': 14, 'trophies': 5620, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 22, 'previousClanRank': 26, 'donations': 424, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#29GG02GV2', 'name': 'lele', 'role': 'member', 'lastSeen': '20211111T140731.000Z', 'expLevel': 14, 'trophies': 5617, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 23, 'previousClanRank': 23, 'donations': 85, 'donationsReceived': 120, 'clanChestPoints': 0}, {'tag': '#8G8288YU', 'name': 'Chipo', 'role': 'elder', 'lastSeen': '20211111T142213.000Z', 'expLevel': 13, 'trophies': 5604, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 24, 'previousClanRank': 21, 'donations': 534, 'donationsReceived': 400, 'clanChestPoints': 0}, {'tag': '#20VYLQ8GV', 'name': 'Giovanni', 'role': 'member', 'lastSeen': '20211111T130426.000Z', 'expLevel': 12, 'trophies': 5602, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clanRank': 25, 'previousClanRank': 32, 'donations': 276, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#C8JQR0G8', 'name': 'minibobby', 'role': 'member', 'lastSeen': '20211111T132415.000Z', 'expLevel': 13, 'trophies': 5601, 'arena': {'id': 54000014, 'name': 'Challenger III'}, 'clan

Rank': 26, 'previousClanRank': 24, 'donations': 638, 'donationsReceived': 440, 'clanChestPoints': 0}, {'tag': '#8RUP9CGQ', 'name': 'aldino', 'role': 'elder', 'lastSeen': '20211111T113608.000Z', 'expLevel': 14, 'trophies': 5599, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 27, 'previousClanRank': 25, 'donations': 60, 'donationsReceived': 40, 'clanChestPoints': 0}, {'tag': '#90PGRQUL', 'name': 'ParcoJonas', 'role': 'member', 'lastSeen': '20211110T200524.000Z', 'expLevel': 14, 'trophies': 5591, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 28, 'previousClanRank': 29, 'donations': 50, 'donationsReceived': 40, 'clanChestPoints': 0}, {'tag': '#28RUUYCJ0', 'name': 'Il Distruttore', 'role': 'coLeader', 'lastSeen': '20211111T145006.000Z', 'expLevel': 14, 'trophies': 5588, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 29, 'previousClanRank': 27, 'donations': 23, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#2VJ08YGPG', 'name': 'FieldLemon01', 'role': 'member', 'lastSeen': '20211111T145319.000Z', 'expLevel': 14, 'trophies': 5582, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 30, 'previousClanRank': 28, 'donations': 181, 'donationsReceived': 260, 'clanChestPoints': 0}, {'tag': '#8LQRCR28', 'name': 'CavalloPazzo', 'role': 'member', 'lastSeen': '20211111T141334.000Z', 'expLevel': 13, 'trophies': 5545, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 31, 'previousClanRank': 34, 'donations': 568, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#89JRPYRR0', 'name': 'nessuno', 'role': 'member', 'lastSeen': '20211111T131527.000Z', 'expLevel': 14, 'trophies': 5523, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 32, 'previousClanRank': 36, 'donations': 210, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#LLGV2UY', 'name': 'Rudolf001', 'role': 'member', 'lastSeen': '20211111T131909.000Z', 'expLevel': 13, 'trophies': 5514, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 33, 'previousClanRank': 33, 'donations': 448, 'donationsReceived': 440, 'clanChestPoints': 0}, {'tag': '#2YCCYVGLC', 'name': 'aygo', 'role': 'elder', 'lastSeen': '20211111T141321.000Z', 'expLevel': 14, 'trophies': 5499, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 34, 'previousClanRank': 30, 'donations': 78, 'donationsReceived': 400, 'clanChestPoints': 0}, {'tag': '#PY89VV98L', 'name': 'DEATH', 'role': 'elder', 'lastSeen': '20211111T114707.000Z', 'expLevel': 14, 'trophies': 5489, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 35, 'previousClanRank': 31, 'donations': 232, 'donationsReceived': 40, 'clanChestPoints': 0}, {'tag': '#8UJGJC92', 'name': '_MAX_', 'role': 'member', 'lastSeen': '20211111T145740.000Z', 'expLevel': 12, 'trophies': 5462, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 36, 'previousClanRank': 35, 'donations': 16, 'donationsReceived': 200, 'clanChestPoints': 0}, {'tag': '#PQQPU92Q', 'name': 'supermanux91', 'role': 'member', 'lastSeen': '20211111T125818.000Z', 'expLevel': 12, 'trophies': 5441, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 37, 'previousClanRank': 38, 'donations': 188, 'donationsReceived': 200, 'clanChestPoints': 0}, {'tag': '#VL9G82J', 'name': 'Vegeta', 'role': 'elder', 'lastSeen': '20211111T143917.000Z', 'expLevel': 13, 'trophies': 5410, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 38, 'previousClanRank': 42, 'donations': 148, 'donationsReceived': 0, 'clanChestPoints': 0}, {'tag': '#88CGCV2CP', 'name': 'RPG', 'role': 'member', 'lastSeen': '20211111T124507.000Z', 'expLevel': 13, 'trophies': 5399, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 39, 'previousClanRank': 44, 'donations': 156, 'donationsReceived': 240, 'clanChestPoints': 0}, {'tag': '#YR2UGR8Y', 'name': 'HYPE_K1D_Δ', 'role': 'elder', 'lastSeen': '20211111T132803.000Z', 'expLevel': 12, 'trophies': 5398, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 40, 'previousClanRank': 48, 'donations': 340, 'donationsReceived': 40, 'clanChestPoints': 0}, {'tag': '#8UVCC220L', 'name': 'super franz', 'role': 'member', 'lastSeen': '20211111T124557.000Z', 'expLevel': 14, 'trophies': 5395, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 41, 'previousClanRank': 37, 'donations': 394, 'donationsReceived': 120, 'clanChestPoints': 0}, {'tag': '#82QJ8JCQ8', 'name': 'texo turi', 'role': 'member', 'lastSeen': '20211111T122948.000Z', 'expLevel': 13, 'trophies': 5385, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 42, 'previousClanRank': 41, 'donations': 442, 'donationsReceived': 240, 'clanChestPoints': 0}, {'tag': '#Y9VRQ8UG2', 'name': 'Murrinho', 'role': 'member', 'lastSeen': '20211111T134205.000Z', 'expLevel': 11, 'trophies': 5334, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 43, 'previousClanRank': 39, 'donations': 364, 'donationsReceived': 320, 'clanChestPoints': 0}, {'tag': '#2PJ99YC2', 'name': 'rickyeroby2001', 'role': 'member', 'lastSeen': '20211111T140604.000Z', 'expLevel': 12, 'trophies': 5328, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 44, 'previousClanRank': 40, 'donations': 253, 'donationsReceived': 400, 'clanChestPoints': 0}, {'tag': '#22G8PL2JL', 'name': 'jajo', 'role': 'member', 'lastSeen': '20211111T140047.000Z', 'expLevel': 14, 'trophies': 5309, 'arena': {'id': 54000013, 'name': 'Challenger II'}, 'clanRank': 45, 'previousClanRank': 43, 'donations': 136, 'donationsReceived': 240, 'clanChestPoints': 0}, {'tag': '#9PGCUJJ9', 'name': 'zoldk', 'role': 'member', 'lastSeen': '20211111T133432.000Z', 'expLevel': 12, 'trophies': 5263, 'arena': {'id': 54000012, 'name': 'Legendary Arena'}, 'clanRank': 46, 'previousClanRank': 45, 'donations': 272, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#RQLRURLLQ', 'name': 'IlProcione', 'role': 'member', 'lastSeen': '20211111T133258.000Z', 'expLevel': 11, 'trophies': 5244, 'arena': {'id': 54000012, 'name': 'Legendary Arena'}, 'clanRank': 47, 'previousClanRank': 47, 'donations': 531, 'donationsReceived': 280, 'clanChestPoints': 0}, {'tag': '#9VJGJ0YCL', 'name': 'DarKnight', 'role': 'member', 'lastSeen': '20211111T142719.000Z', 'expLevel': 12, 'trophies': 5220, 'arena': {'id': 54000012, 'name': 'Legendary Arena'}, 'clanRank': 48, 'previousClanRank': 46, 'donations': 56, 'donationsReceived': 320, 'clanChestPoints': 0}]

Non essendo una lista regolare, poiché all'interno di Item è presente un'altra directory, non possiamo utilizzare direttamente Players per creare un dataFrame. Per ovviare a questo problema, estrapoliamo manualmente, tramite un ciclo for, le informazioni che riteniamo significative e a noi utili.

In [14]:
```python
player = []
i = 0
for buffer in Players:
    tag = buffer['tag']
    name = buffer['name']
    role =  buffer['role']
    level =  buffer['expLevel']
    trophies =  buffer['trophies']
    donations =  buffer['donations']
    arena = buffer['arena']['name']
    player.append([tag, name, role, level, trophies, arena, donations])
    i += 1
```

Estratte queste informazioni e inserite all'interno di un array regolare, chiamato player, possiamo creare il nostro dataFrame contenente le informazioni base dei giocatori presenti nel clan.

```
import pandas as pd
dataFrame_clan = pd.DataFrame(player, columns=['tag', 'name', 'role', 'level', 'trophies', 'arena', 'donations/mo
```

```
print(dataFrame_clan.info())
dataFrame_clan.head()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 48 entries, 0 to 47
Data columns (total 7 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   tag              48 non-null     object
 1   name             48 non-null     object
 2   role             48 non-null     object
 3   level            48 non-null     int64
 4   trophies         48 non-null     int64
 5   arena            48 non-null     object
 6   donations/month  48 non-null     int64
dtypes: int64(3), object(4)
memory usage: 2.8+ KB
None
```

	tag	name	role	level	trophies	arena	donations/month
0	#C8J9QQP	☆マッテオ_Hele✦♦	leader	14	6153	Master I	400
1	#8GJUCG0VL	sfa	elder	14	6071	Master I	256
2	#2J2Q88VQ	Devil	coLeader	14	6038	Master I	655
3	#22JPPY20Q	Giskard	elder	14	6015	Master I	6
4	#8CVQRU08P	luca9398	elder	14	6000	Master I	230

Con le informazioni estratte calcoliamo la media dei livelli dei giocatori. Creiamo un grafico per visualizzare i dati.

```
dataFrame_clan['level'].hist().set_title("Levels")
```

Text(0.5, 1.0, 'Levels')
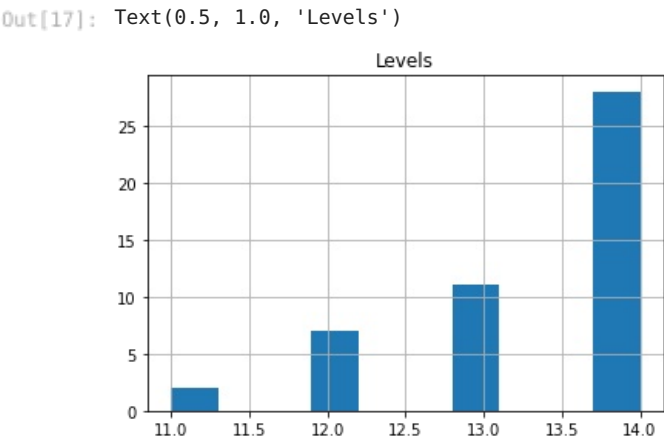
Tramite questa visualizzazione ci possiamo facilmente rendere conto che la maggior parte dei giocatori presenti in questo clan è di livello 14; mentre sono totalmente assenti membri con livello 9 o inferiore.

Analisi Giocatori Del Clan

Estrazione informazioni da tutti i players del clan

Le informazioni sui giocatori che possiamo ottenere tramite chiamata CURL del clan sono limitate e non sufficienti, per cui possiamo andare ancora più in fondo estrapolando maggiori informazioni inerenti i giocatori.

```
temp = []
i = 0

rows, cols = dataFrame_clan.shape

for i in range(rows):
    # con row mi copio riga per riga il contenuto del dataframe
```

```
        row = dataFrame_clan.iloc[i]
        player_tag = row['tag']

        tagplayer = row['tag']
        tagplayer = tagplayer[1:]


        # url player con il tagg di ogni player
        urlplayer = " https://api.clashroyale.com/v1/players/%23{}".format(tagplayer)
        playerX = requests.get(urlplayer, headers = headers)
        playerX = playerX.json()


        # dati da estrarre
        tag = '#'
        tag += tagplayer
        name = playerX.get('name')
        totalDonations = playerX.get('totalDonations')
        bestTrophies = playerX.get('bestTrophies')
        wins = playerX.get('wins')
        losses = playerX.get('losses')
        threeCrownWins = playerX.get('threeCrownWins')

        temp.append([tag, name, totalDonations, bestTrophies, wins, losses, threeCrownWins])
        i += 1
```

Come precedentemente fatto creiamo un dataFrame tramite l'array formato dalle informazioni da noi estrapolate.

In [19]:
```
dataFrame_baseInfoPlayers = pd.DataFrame(temp, columns=['tag', 'name', 'totalDonations', 'bestTrophies', 'wins',
```

In [20]:
```
print(dataFrame_baseInfoPlayers.info())
dataFrame_baseInfoPlayers.head()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 48 entries, 0 to 47
Data columns (total 7 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   tag             48 non-null     object
 1   name            48 non-null     object
 2   totalDonations  48 non-null     int64
 3   bestTrophies    48 non-null     int64
 4   wins            48 non-null     int64
 5   losses          48 non-null     int64
 6   threeCrownWins  48 non-null     int64
dtypes: int64(5), object(2)
memory usage: 2.8+ KB
None
```

Out[20]:

	tag	name	totalDonations	bestTrophies	wins	losses	threeCrownWins
0	#C8J9QQP	✦マッテオ_Hele✐♦	293005	6677	8688	6139	3864
1	#8GJUCG0VL	sfa	83777	6427	7580	6409	3208
2	#2J2Q88VQ	Devil	174874	6777	11211	9940	3420
3	#22JPPY20Q	Giskard	67157	6076	9122	9434	3798
4	#8CVQRU08P	luca9398	65611	6119	4709	5321	1795

Abbiamo così estratto delle informazioni in più come:

```
    - Le donazioni totali (totalDonations);
    - Il record personale di coppe (bestTrophies);
    - Le vittorie (wins);
    - Le sconfitte (losses);
    - Le vittorie effettuate con tre corone (threeCrownWins).
```

Con i dati estratti calcoliamo il tasso di vittoria (winrate) e il tasso di vittoria con tre corone (threeCrownWinsPercentage) rispetto le partite totali. Per inserire questi valori all'interno del dataFrame precedentemente creato, si aggiungono due colonne con valore iniziale 0, che saranno 'winRate' e 'threeCrownWinsPercentage'.

In [21]:
```
dataFrame_baseInfoPlayers = dataFrame_baseInfoPlayers.assign(winRate = 0)
dataFrame_baseInfoPlayers = dataFrame_baseInfoPlayers.assign(threeCrownWinsPercentage = 0)
```

In [22]:
```
rows, cols = dataFrame_baseInfoPlayers.shape
```

```
rows, cols = dataFrame_baseInfoPlayers.snape
for i in range(rows):
    row = dataFrame_baseInfoPlayers.iloc[i]
    tag = row['tag']
    wins = row["wins"]
    losses = row["losses"]
    win_rate = wins / (wins + losses)
    dataFrame_baseInfoPlayers.loc[dataFrame_baseInfoPlayers.tag == tag, "winRate"] = round(win_rate, 2)
    threeCrownWins = row['threeCrownWins']
    threeCrownWinsPercentage = threeCrownWins / (wins + losses)
    dataFrame_baseInfoPlayers.loc[dataFrame_baseInfoPlayers.tag == tag, "threeCrownWinsPercentage"] = round(three

dataFrame_baseInfoPlayers.info()
dataFrame_baseInfoPlayers.head()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 48 entries, 0 to 47
Data columns (total 9 columns):
 #   Column                    Non-Null Count  Dtype
---  ------                    --------------  -----
 0   tag                       48 non-null     object
 1   name                      48 non-null     object
 2   totalDonations            48 non-null     int64
 3   bestTrophies              48 non-null     int64
 4   wins                      48 non-null     int64
 5   losses                    48 non-null     int64
 6   threeCrownWins            48 non-null     int64
 7   winRate                   48 non-null     float64
 8   threeCrownWinsPercentage  48 non-null     float64
dtypes: float64(2), int64(5), object(2)
memory usage: 3.5+ KB
```

Out[22]:

	tag	name	totalDonations	bestTrophies	wins	losses	threeCrownWins	winRate	threeCrownWinsPercentage
0	#C8J9QQP	☆マッテオ_Hele🔥♦	293005	6677	8688	6139	3864	0.59	0.26
1	#8GJUCG0VL	sfa	83777	6427	7580	6409	3208	0.54	0.23
2	#2J2Q88VQ	Devil	174874	6777	11211	9940	3420	0.53	0.16
3	#22JPPY20Q	Giskard	67157	6076	9122	9434	3798	0.49	0.20
4	#8CVQRU08P	luca9398	65611	6119	4709	5321	1795	0.47	0.18

ESTRAPOLAZIONE INFORMAZIONI SULLE CARTE

limit = 999 è un valore appositamente molto più alto del numero delle carte. In questo modo siamo sicuri di prendere tutte le carte, che per l'appunto sono 106.

In [23]:
```
urlplayer = "https://api.clashroyale.com/v1/cards?limit=999"
cardsx = requests.get(urlplayer, headers = headers)
cardsx = cardsx.json()['items']
```

In name_cards verranno annotati tutti i nomi delle carte presenti nel gioco.

In [24]:
```
name_cards = []
for buffer in cardsx:
    name = buffer["name"]
    name_cards.append(name)
print(name_cards)
```

```
['Knight', 'Archers', 'Goblins', 'Giant', 'P.E.K.K.A', 'Minions', 'Balloon', 'Witch', 'Barbarians', 'Golem', 'Ske
letons', 'Valkyrie', 'Skeleton Army', 'Bomber', 'Musketeer', 'Baby Dragon', 'Prince', 'Wizard', 'Mini P.E.K.K.A',
'Spear Goblins', 'Giant Skeleton', 'Hog Rider', 'Minion Horde', 'Ice Wizard', 'Royal Giant', 'Guards', 'Princess'
, 'Dark Prince', 'Three Musketeers', 'Lava Hound', 'Ice Spirit', 'Fire Spirit', 'Miner', 'Sparky', 'Bowler', 'Lum
berjack', 'Battle Ram', 'Inferno Dragon', 'Ice Golem', 'Mega Minion', 'Dart Goblin', 'Goblin Gang', 'Electro Wiza
rd', 'Elite Barbarians', 'Hunter', 'Executioner', 'Bandit', 'Royal Recruits', 'Night Witch', 'Bats', 'Royal Ghost
', 'Ram Rider', 'Zappies', 'Rascals', 'Cannon Cart', 'Mega Knight', 'Skeleton Barrel', 'Flying Machine', 'Wall Br
eakers', 'Royal Hogs', 'Goblin Giant', 'Fisherman', 'Magic Archer', 'Electro Dragon', 'Firecracker', 'Elixir Gole
m', 'Battle Healer', 'Skeleton King', 'Archer Queen', 'Golden Knight', 'Skeleton Dragons', 'Mother Witch', 'Elect
ro Spirit', 'Electro Giant', 'Cannon', 'Goblin Hut', 'Mortar', 'Inferno Tower', 'Bomb Tower', 'Barbarian Hut', 'T
esla', 'Elixir Collector', 'X-Bow', 'Tombstone', 'Furnace', 'Goblin Cage', 'Goblin Drill', 'Fireball', 'Arrows',
'Rage', 'Rocket', 'Goblin Barrel', 'Freeze', 'Mirror', 'Lightning', 'Zap', 'Poison', 'Graveyard', 'The Log', 'Tor
nado', 'Clone', 'Earthquake', 'Barbarian Barrel', 'Heal Spirit', 'Giant Snowball', 'Royal Delivery']
```

Tramite l'API fornito da Clash Royale non è possibile risalire all'elisir delle carte, per questo motivo tramite scraping otteniamo l'elisir di ogni carta. Le informazioni vengono salvate all'interno di un dizionario che viene salvato in loco, nel caso in cui questo dizionario non è prensente

lo si crea, caso contrario lo si carica.

In [25]:
```python
from os.path import exists
import pickle
if not exists("./Elixir/elixir.pickle"):
    dictionary = {}
    for card in name_cards:
        name = card.replace(' ', '-').replace('.', '').lower()
        url = "https://royaleapi.com/card/{}".format(name)
        html_page = !curl -X GET "{url}"
        for line in html_page:
            if "Elixir:" in line:
                dictionary[card] = line.split()[1]
                #print([card, line])
                break
    f = open("./Elixir/elixir.pickle","wb")
    pickle.dump(dictionary, f)
    f.close()
```

In [26]:
```python
f = open("./Elixir/elixir.pickle","rb")
elixirs = pickle.load(f)
f.close()
```

In [27]:
```python
print(elixirs)
```

```
{'Knight': '3', 'Archers': '3', 'Goblins': '2', 'Giant': '5', 'P.E.K.K.A': '7', 'Minions': '3', 'Balloon': '5', '
Witch': '5', 'Barbarians': '5', 'Golem': '8', 'Skeletons': '1', 'Valkyrie': '4', 'Skeleton Army': '3', 'Bomber':
'2', 'Musketeer': '4', 'Baby Dragon': '4', 'Prince': '5', 'Wizard': '5', 'Mini P.E.K.K.A': '4', 'Spear Goblins':
'2', 'Giant Skeleton': '6', 'Hog Rider': '4', 'Minion Horde': '5', 'Ice Wizard': '3', 'Royal Giant': '6', 'Guards
': '3', 'Princess': '3', 'Dark Prince': '4', 'Three Musketeers': '9', 'Lava Hound': '7', 'Ice Spirit': '1', 'Fire
Spirit': '1', 'Miner': '3', 'Sparky': '6', 'Bowler': '5', 'Lumberjack': '4', 'Battle Ram': '4', 'Inferno Dragon':
'4', 'Ice Golem': '2', 'Mega Minion': '3', 'Dart Goblin': '3', 'Goblin Gang': '3', 'Electro Wizard': '4', 'Elite
Barbarians': '6', 'Hunter': '4', 'Executioner': '5', 'Bandit': '3', 'Royal Recruits': '7', 'Night Witch': '4', 'B
ats': '2', 'Royal Ghost': '3', 'Ram Rider': '5', 'Zappies': '4', 'Rascals': '5', 'Cannon Cart': '5', 'Mega Knight
': '7', 'Skeleton Barrel': '3', 'Flying Machine': '4', 'Wall Breakers': '2', 'Royal Hogs': '5', 'Goblin Giant': '
6', 'Fisherman': '3', 'Magic Archer': '4', 'Electro Dragon': '5', 'Firecracker': '3', 'Elixir Golem': '3', 'Battl
e Healer': '4', 'Skeleton King': '4', 'Archer Queen': '5', 'Golden Knight': '4', 'Skeleton Dragons': '4', 'Mother
Witch': '4', 'Electro Spirit': '1', 'Electro Giant': '8', 'Cannon': '3', 'Goblin Hut': '5', 'Mortar': '4', 'Infer
no Tower': '5', 'Bomb Tower': '4', 'Barbarian Hut': '7', 'Tesla': '4', 'Elixir Collector': '6', 'X-Bow': '6', 'To
mbstone': '3', 'Furnace': '4', 'Goblin Cage': '4', 'Goblin Drill': '4', 'Fireball': '4', 'Arrows': '3', 'Rage': '
2', 'Rocket': '6', 'Goblin Barrel': '3', 'Freeze': '4', 'Mirror': '1', 'Lightning': '6', 'Zap': '2', 'Poison': '4
', 'Graveyard': '5', 'The Log': '2', 'Tornado': '3', 'Clone': '3', 'Earthquake': '3', 'Barbarian Barrel': '2', 'H
eal Spirit': '1', 'Giant Snowball': '2', 'Royal Delivery': '3'}
```

In [28]:
```python
elixir = []
for name in name_cards:
    elixir.append(elixirs[name])
```

In [29]:
```python
import pandas as pd
dataFrame_elixirs = pd.DataFrame({'card' : name_cards, 'elixir' : elixir})
dataFrame_elixirs.info()
dataFrame_elixirs.head()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 106 entries, 0 to 105
Data columns (total 2 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   card    106 non-null    object
 1   elixir  106 non-null    object
dtypes: object(2)
memory usage: 1.8+ KB
```

Out[29]:

	card	elixir
0	Knight	3
1	Archers	3
2	Goblins	2
3	Giant	5
4	P.E.K.K.A	7

In [30]:
```python
import seaborn as sns
```

```
import seaborn as sns
sns.countplot(x = dataFrame_elixirs['elixir']).set_title("Average Elixirs")
```

Out[30]: Text(0.5, 1.0, 'Average Elixirs')
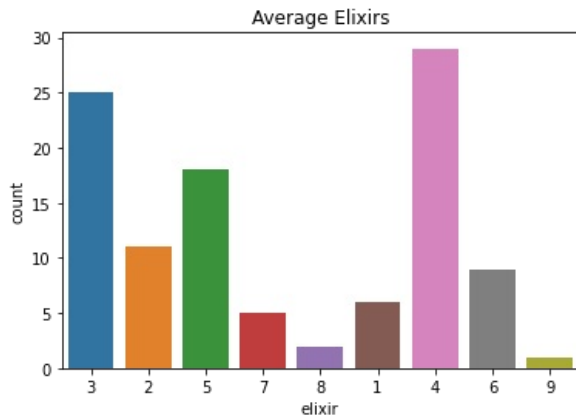
LIVELLO CARTE GIOCATORI

Adesso che abbiamo tutte le carte del gioco possiamo vedere a che livello ha le carte ogni giocatore del clan. I vettori names e tags conterranno rispettivamente i nomi e i tag dei giocatori del clan, essi verranno estratti dal dataFrame "dataFrame_baseInfoPlayers".

In [31]:
```
names = []
tags = []
rows, cols = dataFrame_baseInfoPlayers.shape
for i in range(rows):
    row = dataFrame_baseInfoPlayers.iloc[i]
    tag , name  = row['tag'], row['name']
    tags.append(tag)
    names.append(name)
```

Si crea il dataFrame "dataFrame_playerCards" il quale conterrà come attributi il tag del giocatore, il nome giocatore e tutte le occorrenze dei nomi delle carte. Il dataFrame verrà inizializzato con valore 0.

In [32]:
```
dataFrame_playerCards = pd.DataFrame({'tag' : tags, 'name' : names})
dataFrame_playerCards.head()
i = 0
list0 = [0] * len(tags)
for buffer in name_cards:
    name_card = buffer
    dataFrame_playerCards.loc[:, name_card] = list0[0]
    i += 1
dataFrame_playerCards.info()
dataFrame_playerCards.head()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 48 entries, 0 to 47
Columns: 108 entries, tag to Royal Delivery
dtypes: int64(106), object(2)
memory usage: 40.6+ KB
```

Out[32]:

	tag	name	Knight	Archers	Goblins	Giant	P.E.K.K.A	Minions	Balloon	Witch	...	Poison	Graveyard	The Log	Tornado	Clone
0	#C8J9QQP	☆マッテ オ _Hele✐♦	0	0	0	0	0	0	0	0	...	0	0	0	0	0
1	#8GJUCG0VL	sfa	0	0	0	0	0	0	0	0	...	0	0	0	0	0
2	#2J2Q88VQ	Devil	0	0	0	0	0	0	0	0	...	0	0	0	0	0
3	#22JPPY20Q	Giskard	0	0	0	0	0	0	0	0	...	0	0	0	0	0
4	#8CVQRU08P	luca9398	0	0	0	0	0	0	0	0	...	0	0	0	0	0

5 rows × 108 columns

Tramite la chiamata CURL seguente otteniamo delle informazioni aggiuntive di ogni giocatore, tramite il tag, come nella chiamata dei giocatori del clan precedentemente fatta. Delle informazione a disposizione preleviamo il livello (level) e il livello stella di ogni carta (starLevel), aggiornando il dataFrame "dataFrame_playerCards".

```
In [33]:
rows, cols = dataFrame_playerCards.shape
for i in range(rows):
    row = dataFrame_playerCards.iloc[i]
    tag_player = row["tag"]
    tag_player = tag_player[1:]
    urlplayer = " https://api.clashroyale.com/v1/players/%23{}".format(tag_player)
    player0 = requests.get(urlplayer, headers = headers)
    player0 = player0.json()
    cardsx = player0.get('cards')
    j = 0
    for buffer in cardsx:
        levels = []
        level = buffer["level"]
        try:
            starLevel = buffer["starLevel"]
        except:
            starLevel = 0
        dataFrame_playerCards.iloc[i,j+2] = level
        j += 1
    i += 1
dataFrame_playerCards.info()
dataFrame_playerCards.head()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 48 entries, 0 to 47
Columns: 108 entries, tag to Royal Delivery
dtypes: int64(106), object(2)
memory usage: 40.6+ KB
```

Out[33]:

	tag	name	Knight	Archers	Goblins	Giant	P.E.K.K.A	Minions	Balloon	Witch	...	Poison	Graveyard	The Log	Tornado	Clone
0	#C8J9QQP	⋆マッテオ_Hele⚔♦	13	8	11	8	11	8	11	13	...	8	5	4	6	9
1	#8GJUCG0VL	sfa	12	11	13	4	3	12	10	10	...	6	8	11	12	6
2	#2J2Q88VQ	Devil	11	3	12	9	3	6	7	8	...	13	6	12	6	9
3	#22JPPY20Q	Giskard	5	8	8	10	5	2	8	5	...	11	5	9	9	6
4	#8CVQRU08P	luca9398	1	8	8	2	6	4	1	2	...	12	5	14	11	9

5 rows × 108 columns

Stima del livello delle carte dei giocatori

Conoscendo tutti i livelli delle carte di ogni giocatore è possibile utilizzare questi dati per creare una media del livello delle carte. Questa media la salveremo all'interno di un nuovo dataFrame.

```
In [34]:
n_carte = len(name_cards)
i = 0
rows, cols = dataFrame_playerCards.shape
media = [0] * rows
for i in range(rows):
    row = dataFrame_playerCards.iloc[i]
    j = 0
    somma = 0
    for tmp in row:
        if(j > 2):
            somma += row[j]
        j += 1
    media[i] = int(somma / j)
    i += 1

dataFrame_averageCards = pd.DataFrame({'tag' : tags, 'name' : names, "media carte" : media})
dataFrame_averageCards.head()
```

Out[34]:

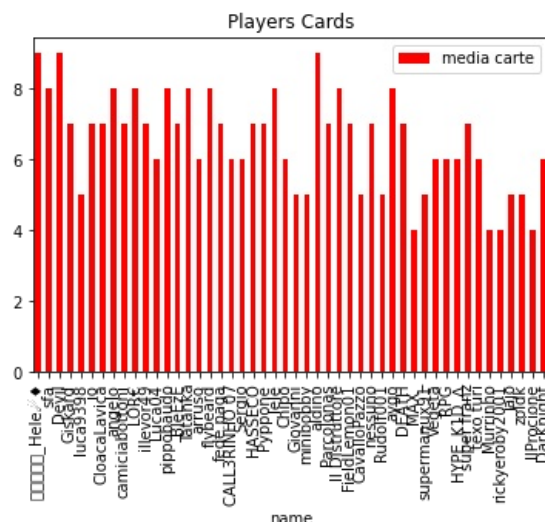|	tag	name	media carte
0	#C8J9QQP	⋆マッテオ_Hele⚔♦	9
1	#8GJUCG0VL	sfa	8
2	#2J2Q88VQ	Devil	9
3	#22JPPY20Q	Giskard	7
4	#8CVQRU08P	luca9398	5

A seguire il grafico che indica la media delle carte (asse y) e il giocatore su cui abbiamo calcolato la media (asse x).

In [35]:
```python
# Grafico media carte per ogni giocatore
from matplotlib import pyplot as plt

plt.figure(figsize = (10, 10))
dataFrame_averageCards.plot.bar(x = 'name', y='media carte', color = 'red')
plt.title("Players Cards")
plt.show()
```

```
<Figure size 720x720 with 0 Axes>
```

```
/opt/anaconda3/lib/python3.8/site-packages/matplotlib/backends/backend_agg.py:238: RuntimeWarning: Glyph 11088 mi
ssing from current font.
  font.set_text(s, 0.0, flags=flags)
/opt/anaconda3/lib/python3.8/site-packages/matplotlib/backends/backend_agg.py:238: RuntimeWarning: Glyph 12510 mi
ssing from current font.
  font.set_text(s, 0.0, flags=flags)
/opt/anaconda3/lib/python3.8/site-packages/matplotlib/backends/backend_agg.py:238: RuntimeWarning: Glyph 12483 mi
ssing from current font.
  font.set_text(s, 0.0, flags=flags)
/opt/anaconda3/lib/python3.8/site-packages/matplotlib/backends/backend_agg.py:238: RuntimeWarning: Glyph 12486 mi
ssing from current font.
  font.set_text(s, 0.0, flags=flags)
/opt/anaconda3/lib/python3.8/site-packages/matplotlib/backends/backend_agg.py:238: RuntimeWarning: Glyph 12458 mi
ssing from current font.
  font.set_text(s, 0.0, flags=flags)
/opt/anaconda3/lib/python3.8/site-packages/matplotlib/backends/backend_agg.py:201: RuntimeWarning: Glyph 11088 mi
ssing from current font.
  font.set_text(s, 0, flags=flags)
/opt/anaconda3/lib/python3.8/site-packages/matplotlib/backends/backend_agg.py:201: RuntimeWarning: Glyph 12510 mi
ssing from current font.
  font.set_text(s, 0, flags=flags)
/opt/anaconda3/lib/python3.8/site-packages/matplotlib/backends/backend_agg.py:201: RuntimeWarning: Glyph 12483 mi
ssing from current font.
  font.set_text(s, 0, flags=flags)
/opt/anaconda3/lib/python3.8/site-packages/matplotlib/backends/backend_agg.py:201: RuntimeWarning: Glyph 12486 mi
ssing from current font.
  font.set_text(s, 0, flags=flags)
/opt/anaconda3/lib/python3.8/site-packages/matplotlib/backends/backend_agg.py:201: RuntimeWarning: Glyph 12458 mi
ssing from current font.
  font.set_text(s, 0, flags=flags)
```


Tramite questo grafico possiamo vedere che solo in pochi hanno livello carte 9, ma a causa del gran numero di membri è poco chiara la lettura del grafico, pertanto per avere un'idea generale del livello medio delle carte dei giocatori del clan, creiamo un grafico che mostra la media dei livelli medi delle carte dei giocatori, in modo da poter visualizzare una stima generale.

In [36]:
```python
import seaborn as sns
sns.distplot(x = dataFrame_averageCards['media carte'], bins = 10).set_title("Media carte giocatori")
```

```
/opt/anaconda3/lib/python3.8/site-packages/seaborn/distributions.py:2557: FutureWarning: `distplot` is a deprecat
ed function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-lev
el function with similar flexibility) or `histplot` (an axes-level function for histograms).
  warnings.warn(msg, FutureWarning)
```
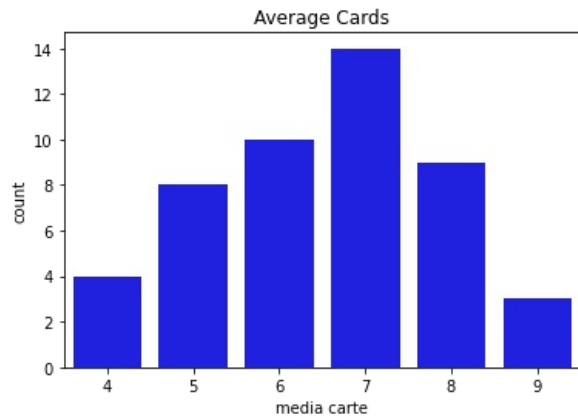
Out[36]: Text(0.5, 1.0, 'Media carte giocatori')

Media carte giocatori
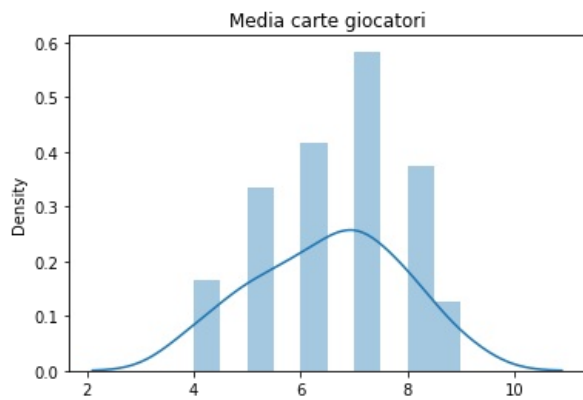
Pertanto possiamo vedere che il livello di carte più frequente è 7.

```
In [37]:   import seaborn as sns
           sns.countplot(x = dataFrame_averageCards['media carte'], color = "blue").set_title("Average Cards")
```

Out[37]:   Text(0.5, 1.0, 'Average Cards')

Average Cards

Conclusioni

Attraverso Clash Royale API è possibile acquisire informazioni su: clan, giocatori e carte. È essenziale saper utilizzare le API messe a disposizione dal Social Network al fine di accelerare lo studio e permettere analisi sempre più complesse. Clash Royale è un videogames affermato da tempo e anche solo con le risorse ufficiali è possibile mettersi in gioco sin da subito in maniera competitiva.