ISTA 322 Homework 1

Welcome to your first homework! This one is focused on just practicing some of the exercises covered in the last coding lesson. There are also some more open-ended questions with elements that I didn't demonstrate in that lesson... they're structurally similar, but you might need to google a thing or two to figure out the correction function.

You need to add your own code blocks to answer any of the coding questions. Also, at the end of some sections I have a 'questions' section. Add a text cell right below and enter your answers.

Submission Instruction

1) First create a copy of this notebook in your drive and rename it to "ISTA_322_F22_HW1_yourname".

2) When you are ready to submit. Prepare three files: the python file (File->Download->Download .py), the notebook file (File->Download->Download .ipynb), and **PDF** version of your notebook (**after running all cells**).

3) Create the directory with your name put all three files in it, ZIP, and submit in D2L.

Loading and Importing

First thing you need to do is load up your packages and then bring in the data.

This dataset contains daily values for Amazon's stock. This includes opening, closing, high price, low price, and also the amount of stock traded.

```python
import pandas as pd
# also import matplotlib.pyplot and numpy with the proper aliases
import numpy as np
import matplotlib.pyplot as plt
```

```python
# Bring in your data. You just need to run this cell.
price = pd.read_csv("https://docs.google.com/spreadsheets/d/1lCkFZhz-NGTuE1Zilz
```

Exploring the whole dataset

Now make some code cells to explore the whole dataset. I want you to do the following:

- Get the number of rows and columns
- Get the datatypes of each column

- Look at the first five rows
- Look at the last five rows
- Look at summary statistics

```
In [799…   # Get the number of rows and columns
           price.shape
```

Out[799]: `(5852, 7)`

There are 5852 rows and 7 columns in the price dataset.

```
In [800…   # Get the datatypes of each column
           price.dtypes
```

Out[800]:
```
Date          object
Open          float64
High          float64
Low           float64
Close         float64
Adj Close     float64
Volume         int64
dtype: object
```

```
In [801…   # Look at the first 5 rows
           price.head(5)
```

Out[801]:

	Date	Open	High	Low	Close	Adj Close	Volume
0	1997-05-15	2.437500	2.500000	1.927083	1.958333	1.958333	72156000
1	1997-05-16	1.968750	1.979167	1.708333	1.729167	1.729167	14700000
2	1997-05-19	1.760417	1.770833	1.625000	1.708333	1.708333	6106800
3	1997-05-20	1.729167	1.750000	1.635417	1.635417	1.635417	5467200
4	1997-05-21	1.635417	1.645833	1.375000	1.427083	1.427083	18853200

Questions

Write down Pandas instruction to answer these queries.

- How many rows are in this dataset?
- Do any datatypes need to be converted?
- What was the mean and all time high opening stock price?

```
In [802…   # Look at the last 5 rows
           price.tail(5)
```

Out[802]:

	Date	Open	High	Low	Close	Adj Close	Volume
5847	2020-08-10	3170.310059	3172.510010	3101.520020	3148.159912	3148.159912	3167300
5848	2020-08-11	3113.199951	3159.219971	3073.000000	3080.669922	3080.669922	3718100
5849	2020-08-12	3108.000000	3174.389893	3101.419922	3162.239990	3162.239990	3527200
5850	2020-08-13	3182.989990	3217.520020	3155.000000	3161.020020	3161.020020	3149000
5851	2020-08-14	3178.179932	3178.239990	3120.000000	3148.020020	3148.020020	2749200

In [803…

```python
# Look at the summary statistics
price.describe()
```

Out[803]:

	Open	High	Low	Close	Adj Close	Volume
count	5852.000000	5852.000000	5852.000000	5852.000000	5852.000000	5.852000e+03
mean	377.469557	381.737827	372.815253	377.500736	377.500736	7.512673e+06
std	596.291033	602.615299	589.226694	596.287464	596.287464	7.278144e+06
min	1.406250	1.447917	1.312500	1.395833	1.395833	4.872000e+05
25%	37.995000	38.590000	37.247501	37.950001	37.950001	3.681975e+06
50%	83.699997	85.029999	82.055000	83.602501	83.602501	5.652850e+06
75%	360.852501	365.794991	357.877510	362.217506	362.217506	8.517450e+06
max	3251.060059	3344.290039	3165.429932	3225.000000	3225.000000	1.043292e+08

Q1: [2 points] How many rows are in this dataset?

There are 5852 rows in the dataset.

In [804…

```python
# Do not change the function name
def price_number_of_row():
    cnt = price.count()
    return cnt ## replace this line with return of the correct statement
```

As an example, I will provide the answer to this question:

In [805…

```python
def price_number_of_row_key():
    return price.count();
```

This is how I will check your code:

In [806…

```python
score = {}
```

In [807…

```python
if np.all(price_number_of_row() == price_number_of_row_key()):
    score['q1'] = 2;
```

```python
    else:
        score['q1'] = 0;
```

In [808...] `score`

Out[808]: `{'q1': 2}`

Question 2: [2 points] Convert the datatype of 'Date' to an appropriate type

In [809...]
```python
def convert_date_type():
    price['Date'] = pd.to_datetime(price['Date'])
```

I give you the grader statement for this one too:

In [810...]
```python
convert_date_type()
if price.Date.dtype == "datetime64[ns]":
    score['q2'] = 2
```

In [811...] `score`

Out[811]: `{'q1': 2, 'q2': 2}`

Question 3: [2 points] What is the mean of all opening stock price?

In [812...]
```python
def mean_of_opening():
    dtype = price['Open'].mean()
    return dtype # replace this with the correct statement

# print(mean_of_opening())
```

Question 4: [4 points] What is the daily min volume for trades after 2010 (including 2010-1-1)

In [813...]
```python
def min_daily_volume_after_2010():
    # Hint first construct a new dataframe by limiting the price for dates grea
    vol_df = price[(price['Date'] >= '2010-01-01')]
    return vol_df['Volume'].min() # Replace this with your answer

# print(min_daily_volume_after_2010())
```

Question 5: [4 points] Make a new column called up_binom. The value of up_binom is 1 if the closing price of the stock is higher (>=) than opening price, and 0 otherwise. Then find the number days the stock closed higher than openning.
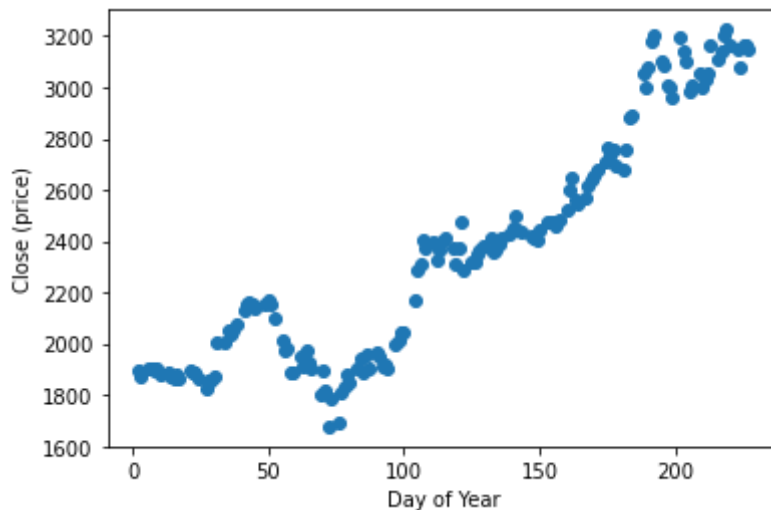
In [814...]
```python
def number_of_green_days():
    price['up_binom'] = price['Close'] >= price['Open']
    return price['up_binom'].sum(); # Replace this with your answer

# print(number_of_green_days())
```

Question 5 [4 points] Plot the Closing price of the stock after 2020. The x-axis is day and the y-axis is the Closing price. Look at the examples here for more help
https://matplotlib.org/stable/gallery/index.html)

In [815…
```python
# plot
df = price[(price['Date'] >= '2020-01-01')]
plt.scatter(x = df['Date'].dt.dayofyear, y = df['Close']) # scatterplot
plt.xlabel('Day of Year') # give x label
plt.ylabel('Close (price)') # give y label
plt.show()
```


Question 6: [4 points] If you had bought 1000$ worth Amazon stock (assume you could have fraction of stock too) on 2000-1-1 at opening, how much money would you have had on 2020-1-1 at closing?

In [816…
```python
# I'm going to make your life easier and set the date column you created as the
# This will make searching and extracting the values much easier
price = price.set_index('Date')

def market_value(buy_date, sell_date):
    price_df = price.loc[buy_date: sell_date]
    buy_close = price_df.iloc[0]['Close']
    sell_close = price_df.iloc[-1]['Close']
    shares = 1000 / buy_close
    close_val = shares * sell_close
    # profit = close_val - 1000
    # print(buy_close, shares, close_val, profit)
    # return profit
    return close_val

print(market_value('2000-1-1', '2020-1-1'))
```

```
20675.132486713286
```

JSON

The last part of the assignment will have you working with some basic JSON data. The URL links to a JSON file with stats on every episode of the TV show Silicon Valley

In [817…
```python
# First just run this to import the data
import requests
url = 'http://api.tvmaze.com/singlesearch/shows?q=Silicon Valley&embed=episodes
```

```python
sv_json_obj = requests.get(url)
sv_json = sv_json_obj.json()
```

Viewing your JSON

Now just to look at what's in the JSON a bit

- Make a code cell that just calls the JSON we named above.
- Also run the .keys() function on the object.

In [818…
```python
# Make code cell that call JSON
sv_json
```

```python
sv_json_obj = requests.get(url)
sv_json = sv_json_obj.json()
```

```
Out[818]:  {'id': 143,
            'url': 'https://www.tvmaze.com/shows/143/silicon-valley',
            'name': 'Silicon Valley',
            'type': 'Scripted',
            'language': 'English',
            'genres': ['Comedy'],
            'status': 'Ended',
            'runtime': 30,
            'averageRuntime': 30,
            'premiered': '2014-04-06',
            'ended': '2019-12-08',
            'officialSite': 'http://www.hbo.com/silicon-valley/',
            'schedule': {'time': '22:00', 'days': ['Sunday']},
            'rating': {'average': 8.4},
            'weight': 96,
            'network': {'id': 8,
             'name': 'HBO',
             'country': {'name': 'United States',
              'code': 'US',
              'timezone': 'America/New_York'},
             'officialSite': 'https://www.hbo.com/'},
            'webChannel': None,
            'dvdCountry': None,
            'externals': {'tvrage': 33759, 'thetvdb': 277165, 'imdb': 'tt2575988'},
            'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_portrai
          t/215/538434.jpg',
             'original': 'https://static.tvmaze.com/uploads/images/original_untouched/21
          5/538434.jpg'},
            'summary': '<p>In the high-tech gold rush of modern Silicon Valley, the peop
          le most qualified to succeed are the least capable of handling success. From
          Mike Judge comes this satire about a programmer whose game-changing algorithm
          becomes the subject of a valley-wide bidding war.</p>',
            'updated': 1643698751,
            '_links': {'self': {'href': 'https://api.tvmaze.com/shows/143'},
             'previousepisode': {'href': 'https://api.tvmaze.com/episodes/1757884'}},
            '_embedded': {'episodes': [{'id': 10897,
              'url': 'https://www.tvmaze.com/episodes/10897/silicon-valley-1x01-minimum
          -viable-product',
              'name': 'Minimum Viable Product',
              'season': 1,
              'number': 1,
              'type': 'regular',
              'airdate': '2014-04-06',
              'airtime': '22:00',
              'airstamp': '2014-04-07T02:00:00+00:00',
              'runtime': 30,
              'rating': {'average': 7.9},
              'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
          scape/49/123633.jpg',
               'original': 'https://static.tvmaze.com/uploads/images/original_untouche
          d/49/123633.jpg'},
              'summary': "<p>Attending an elaborate launch party, Richard and his compu
          ter programmer friends - Big Head, Dinesh and Gilfoyle - dream of making it b
          ig. Instead, they're living in the communal Hacker Hostel owned by former pro
          grammer Erlich, who gets to claim ten percent of anything they invent there.
          When it becomes clear that Richard has developed a powerful compression algor
          ithm for his website, Pied Piper, he finds himself courted by Gavin Belson, h
          is egomaniacal corporate boss, who offers a $10 million buyout by his firm, H
          ooli. But Richard holds back when well-known investor Peter Gregory makes a c
          ounteroffer.</p>",
```

```
      '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/10897'}}},
    {'id': 10898,
     'url': 'https://www.tvmaze.com/episodes/10898/silicon-valley-1x02-the-cap
-table',
     'name': 'The Cap Table',
     'season': 1,
     'number': 2,
     'type': 'regular',
     'airdate': '2014-04-13',
     'airtime': '22:00',
     'airstamp': '2014-04-14T02:00:00+00:00',
     'runtime': 30,
     'rating': {'average': 9},
     'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/49/123634.jpg',
      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/49/123634.jpg'},
     'summary': "<p>After a celebratory party at the Hacker Hostel, Richard an
d Erlich learn that Peter Gregory won't pay up until they deliver a viable bu
siness plan that includes a slimmed-downed staff. A desperate Richard hires f
ormer Belson underling Jared, and they set about trying to trim the fat. Whil
e Gilfoyle and Dinesh prove essential, Big Head's place in the company is les
s certain.</p>",
     '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/10898'}}},
    {'id': 10899,
     'url': 'https://www.tvmaze.com/episodes/10899/silicon-valley-1x03-article
s-of-incorporation',
     'name': 'Articles of Incorporation',
     'season': 1,
     'number': 3,
     'type': 'regular',
     'airdate': '2014-04-20',
     'airtime': '22:00',
     'airstamp': '2014-04-21T02:00:00+00:00',
     'runtime': 30,
     'rating': {'average': 8.6},
     'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/49/123635.jpg',
      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/49/123635.jpg'},
     'summary': '<p>While Gavin Belson begins to hype Nucleus, a competing com
pression platform, Richard learns that the name Pied Piper is already registe
red to a sprinkler company, forcing him to negotiate. Meanwhile, Erlich goes
on a vision quest for a new company name, and Peter Gregory proves elusive wh
en one of his companies asks for money.</p>',
     '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/10899'}}},
    {'id': 10900,
     'url': 'https://www.tvmaze.com/episodes/10900/silicon-valley-1x04-fiducia
ry-duties',
     'name': 'Fiduciary Duties',
     'season': 1,
     'number': 4,
     'type': 'regular',
     'airdate': '2014-04-27',
     'airtime': '22:00',
     'airstamp': '2014-04-28T02:00:00+00:00',
     'runtime': 30,
     'rating': {'average': 9},
     'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/49/123636.jpg',
```

```
     'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/49/123636.jpg'},
     'summary': "<p>At Peter's toga party, Richard drunkenly promises to make
Erlich a board member, which he regrets the next morning. After being unassig
ned at Hooli, Big Head finds others like him who have made careers out of doi
ng nothing. Richard struggles to put Pied Piper's vision into words for a pre
sentation without Erlich; later, he discovers an interesting connection betwe
en Peter and Gavin Belson.</p>",
     '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/10900'}}},
    {'id': 10901,
     'url': 'https://www.tvmaze.com/episodes/10901/silicon-valley-1x05-signali
ng-risk',
     'name': 'Signaling Risk',
     'season': 1,
     'number': 5,
     'type': 'regular',
     'airdate': '2014-05-04',
     'airtime': '22:00',
     'airstamp': '2014-05-05T02:00:00+00:00',
     'runtime': 30,
     'rating': {'average': 9.1},
     'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/49/123637.jpg',
      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/49/123637.jpg'},
     'summary': "<p>Erlich convinces a graffiti artist to create Pied Piper's
logo, with controversial results. Jared tries to make the company more effici
ent. After Gavin Belson and Peter Gregory unexpectedly come face-to-face, Ric
hard learns that he only has eight weeks to prepare for a live demo at TechCr
unch Disrupt.</p>",
     '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/10901'}}},
    {'id': 10902,
     'url': 'https://www.tvmaze.com/episodes/10902/silicon-valley-1x06-third-p
arty-insourcing',
     'name': 'Third Party Insourcing',
     'season': 1,
     'number': 6,
     'type': 'regular',
     'airdate': '2014-05-11',
     'airtime': '22:00',
     'airstamp': '2014-05-12T02:00:00+00:00',
     'runtime': 30,
     'rating': {'average': 8.6},
     'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/49/123638.jpg',
      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/49/123638.jpg'},
     'summary': '<p>Richard feels threatened when the team hires "The Carver",
a hacker with a notorious reputation, to help with Pied Piper\'s cloud. Jared
finds himself taken for a ride when he seeks out Peter Gregory\'s signature.
Erlich and Dinesh compete for the attention of Tara, Gilfoyle\'s visiting gir
lfriend. Later, Dinesh faces a sexual dilemma.</p>',
     '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/10902'}}},
    {'id': 10903,
     'url': 'https://www.tvmaze.com/episodes/10903/silicon-valley-1x07-proof-o
f-concept',
     'name': 'Proof of Concept',
     'season': 1,
     'number': 7,
     'type': 'regular',
```

```
    'airdate': '2014-05-18',
    'airtime': '22:00',
    'airstamp': '2014-05-19T02:00:00+00:00',
    'runtime': 30,
    'rating': {'average': 8.6},
    'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/49/123639.jpg',
      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/49/123639.jpg'},
    'summary': "<p>At TechCrunch Disrupt, Richard feels the pressure to finis
h his demo, but finds himself distracted by a girl he dated briefly, who's no
w spreading rumors about him. Jared worries that Monica is taking his place i
n the company. Dinesh develops a crush on a girl at a neighboring booth. Erli
ch's scandalous past connection to one of the judges threatens Pied Piper's c
hances.</p>",
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/10903'}}},
   {'id': 10904,
    'url': 'https://www.tvmaze.com/episodes/10904/silicon-valley-1x08-optimal
-tip-to-tip-efficiency',
    'name': 'Optimal Tip-to-Tip Efficiency',
    'season': 1,
    'number': 8,
    'type': 'regular',
    'airdate': '2014-06-01',
    'airtime': '22:00',
    'airstamp': '2014-06-02T02:00:00+00:00',
    'runtime': 30,
    'rating': {'average': 8.6},
    'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/49/123640.jpg',
      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/49/123640.jpg'},
    'summary': '<p>Poised to compete at TechCrunch Disrupt, the guys of Pied
Piper become worried after an impressive presentation by Gavin Belson. As Jar
ed tries to pivot the company, Richard is inspired to make big changes at the
last minute.</p>',
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/10904'}}},
   {'id': 117409,
    'url': 'https://www.tvmaze.com/episodes/117409/silicon-valley-2x01-sand-h
ill-shuffle',
    'name': 'Sand Hill Shuffle',
    'season': 2,
    'number': 1,
    'type': 'regular',
    'airdate': '2015-04-12',
    'airtime': '22:00',
    'airstamp': '2015-04-13T02:00:00+00:00',
    'runtime': 30,
    'rating': {'average': 9},
    'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/49/123616.jpg',
      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/49/123616.jpg'},
    'summary': '<p>Season 2 begins with the Pied Piper guys being wined and d
ined by every venture capitalist under the sun, while Monica adjusts to a new
managing partner at Raviga as the company faces major changes.</p>',
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/117409'}}},
   {'id': 142992,
    'url': 'https://www.tvmaze.com/episodes/142992/silicon-valley-2x02-runawa
y-devaluation',
```

```
    'name': 'Runaway Devaluation',
    'season': 2,
    'number': 2,
    'type': 'regular',
    'airdate': '2015-04-19',
    'airtime': '22:00',
    'airstamp': '2015-04-20T02:00:00+00:00',
    'runtime': 30,
    'rating': {'average': 8.6},
    'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/49/123618.jpg',
      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/49/123618.jpg'},
    'summary': "<p>Pied Piper could go under if Richard and the guys can't fi
nd legal and financial help in the wake of Hooli's bombshell. Meanwhile, Dine
sh tries to thwart a fund-raising campaign for his cousin's new app; and Moni
ca tries to keep her interest in Pied Piper separate from her job.</p>",
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/142992'}}},
   {'id': 142993,
    'url': 'https://www.tvmaze.com/episodes/142993/silicon-valley-2x03-bad-mo
ney',
    'name': 'Bad Money',
    'season': 2,
    'number': 3,
    'type': 'regular',
    'airdate': '2015-04-26',
    'airtime': '22:00',
    'airstamp': '2015-04-27T02:00:00+00:00',
    'runtime': 30,
    'rating': {'average': 8},
    'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/49/123619.jpg',
      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/49/123619.jpg'},
    'summary': "<p>Richard mulls a proposal by Gavin, but also considers a pi
tch from Russ Hanneman about backing Pied Piper. Meanwhile, Monica learns sur
prising news about Richard's deal with Hooli; and Gilfoyle and Dinesh go to e
xtremes to get what they want.</p>",
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/142993'}}},
   {'id': 142994,
    'url': 'https://www.tvmaze.com/episodes/142994/silicon-valley-2x04-the-la
dy',
    'name': 'The Lady',
    'season': 2,
    'number': 4,
    'type': 'regular',
    'airdate': '2015-05-03',
    'airtime': '22:00',
    'airstamp': '2015-05-04T02:00:00+00:00',
    'runtime': 30,
    'rating': {'average': 8.3},
    'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/49/123620.jpg',
      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/49/123620.jpg'},
    'summary': '<p>Richard butts heads with Erlich over a prospective hire, w
hile Dinesh and Gilfoyle become suspicious that a new employee they recommend
ed is commanding a higher salary. Big Head gets a surprising promotion at Hoo
li. At a board meeting, Monica and Richard find themselves outvoted; Jared in
stitutes a workplace harassment policy.</p>',
```

          '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/142994'}}},
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    sion. Meanwhile, the guys could be threatened by a nosy neighbor; Guilfoyle s
    ets out to build servers; Richard's reluctant to let Jared move in; and Big H
    ead's leadership skills are suspect.</p>",
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    billionaire when Monica urges the guys to pursue a livestream opportunity, bu
    t Richard learns their friendship isn't what Erlich thinks it is. Meanwhile,
    Jared wants Carla and Monica to be friends.</p>",
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    d/49/123623.jpg'},
          'summary': "<p>The team fields job offers and Russ is distracted by finan

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cial news, but Richard realizes Pied Piper could fold if it doesn't merge wit
h a hated rival. Meanwhile, Dinesh tries to woo a woman online; and Gavin loo
ks on the bright side of Nucleus' failure.</p>",
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d/49/123624.jpg'},
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n a competitor and inadvertently starts a feud. Meanwhile, Jared fibs about P
ied Piper's size; and Gavin looks for a scapegoat when he feels pressure from
board members.</p>",
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nding arbitration, but Richard worries that his rival's claims could have mer
it. Meanwhile, Jared, Dinesh and Gilfoyle debate a philosophical theory; and
Big Head gets a boost.</p>",
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ys-of-the-condor',
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xpected real-life drama draws a spike in traffic to their livestream and leav
es them fighting to hold things together - literally. While Erlich considers
his future, Richard scrambles to save Pied Piper's.</p>",
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a tough decision: accept the diminished role of CTO, or leave Pied Piper for
good. Erlich takes a shine to Jack Barker, Laurie's new choice of CEO, while
Dinesh and Gilfoyle weigh their options in Richard's absence. At Hooli, Gavin
tries to improve his image by admitting failure, and Big Head gets wind of ma
jor changes.</p>",
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yle, but worries Richard; Jared and Erlich both face housing issues; Gavin su
ggests a controversial move.</p>',
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self up to recruiters; Dinesh draws unwanted attention from a recent purchas
e.</p>',
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competition; Monica takes a stand; Gavin makes a decision about Nucleus.</p
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h, Gilfoyle and Jared misplace hardware; Erlich pitches his plans to Big Hea
d.</p>',
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Head and Erlich's launch party has snags; Dinesh falls for a foreign coworke
r.</p>",
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iper, they receive an unexpected response. With a limited number of beta invi
tes each, Dinesh worries about his lack of friends, while Gilfoyle looks to c
atch him in a lie. Monica worries about how to deliver criticism. Facing fina
ncial woes, Erlich considers a big decision, and Gavin challenges the Nucleus
team to do the impossible.</p>',
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o make a choice between their friendship and the company's future. Jared's ne
w Pied Piper apparel makes a splash, and divides Dinesh and Gilfoyle. As Gavi
n faces major life changes, the guys celebrate a rare victory.</p>",
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dge the gap between Pied Piper and its users, leading Jared to take drastic m
easures to hold everything together. Gavin learns secrets about the competiti
on and decides to bring in a new face to reclaim his former glory.</p>',
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uccess leaves Richard in a moral quandary, just as Dinesh's video-chat app ga
thers speed. While Laurie prepares to jump ship, Gavin's comeback at Hooli is
threatened by his displays of grandeur.</p>",
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ruggle to find funding for Pied Piper's video-chat app to keep up with their
rapidly growing user base. Erlich faces resistance from Big Head's dad, while
Gavin balks after Jack steps on his toes at Hooli. Having a hard time adjusti
ng to his company's pivot, Richard gets sage advice from an unexpected sourc
e, leading him to a big idea that could change his future.</p>",
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    o his head. Later, Richard discovers interesting data about PiperChat's user
    s. Erlich makes a play to be involved in Jian-Yang's new app; Jared sets grou
    nd rules in his friendship with Richard; Gavin's paranoia over Jack's enthusi
    asm causes him to make a rash decision.</p>",
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    while trying to move ahead with his next big idea. Eyeing a comeback, Erlich
    pressures an uncooperative Jian-Yang. Monica sets a trap at Raviga to improve
    her standing with Laurie. Dinesh goes on a date; Big Head enters the world of
    academia; Gavin faces an unknown future.</p>',
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s about the company he's keeping. Gilfoyle gets tough on security in the wake
of Dinesh's latest dalliance; later, he considers whether to put his pride as
ide for a job. Concerned about Jian-Yang's commitment to his app, Erlich take
s matters into his own hands.</p>",
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t when he's forced to deal with an unexpected interloper. As things get more
serious, Dinesh scrambles to find a way out of his new relationship. After le
arning of surprising developments afoot at Raviga, Monica has trouble decidin
g which horse to back.</p>",
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he tech bubble, and crosses paths with a contentious figure from Pied Piper's
past. Erlich reaches out to Monica and Laurie in search of a new endeavor. A
launch gone wrong finds Dinesh and Gilfoyle at war as Jared tries to keep the
peace.</p>",
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fiance ends up coming back to haunt him. Gilfoyle goes to desperate measures
to battle Jian-Yang's new smart fridge. Jared embraces multiple identities in
his quest to reduce costs. Erlich tries to hang with the alpha males.</p>",
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1151636'}}},
   {'id': 1151637,
    'url': 'https://www.tvmaze.com/episodes/1151637/silicon-valley-4x08-the-k
eenan-vortex',
    'name': 'The Keenan Vortex',
    'season': 4,
    'number': 8,
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scape/116/291044.jpg',
     'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/116/291044.jpg'},
    'summary': '<p>An unexpected increase in data traffic leads Richard to tu
rn to Erlich for help in garnering a deal with Keenan Feldspar, Silicon Valle
y\'s latest "it" boy — but when Keenan makes a too-good-to-resist offer, Rich
ard must weigh Pied Piper\'s future against a potential mutiny. Jack faces se
tbacks while preparing for Hooli-Con.</p>',
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1151637'}}},
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-con',
    'name': 'Hooli-Con',
    'season': 4,
    'number': 9,
    'type': 'regular',
    'airdate': '2017-06-18',
    'airtime': '22:00',
    'airstamp': '2017-06-19T02:00:00+00:00',
    'runtime': 30,
    'rating': {'average': 8.2},
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scape/117/293508.jpg',
     'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/117/293508.jpg'},
    'summary': '<p>The Pied Piper guys try to pull off a stealth plan at Hool
i-Con.</p>',
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1168582'}}},
   {'id': 1168583,
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r-error',
    'name': 'Server Error',
    'season': 4,
    'number': 10,
    'type': 'regular',
    'airdate': '2017-06-25',
    'airtime': '22:00',
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     'airstamp': '2017-06-26T02:00:00+00:00',
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scape/118/295689.jpg',
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d/118/295689.jpg'},
     'summary': '<p>Richard finds himself in a web of lies; Jared plans his ex
it; Jack bets big; Gavin plots a comeback.</p>',
     '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1168583'}}},
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fast-or-die-slow',
     'name': 'Grow Fast or Die Slow',
     'season': 5,
     'number': 1,
     'type': 'regular',
     'airdate': '2018-03-25',
     'airtime': '22:00',
     'airstamp': '2018-03-26T02:00:00+00:00',
     'runtime': 30,
     'rating': {'average': 7.3},
     'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/149/374260.jpg',
       'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/149/374260.jpg'},
     'summary': "<p>Now that Pied Piper has ample funding and new offices, the
pressure to get things right stymies Richard and forces him to grow the compa
ny in a way he hadn't planned. A picky Dinesh and Gilfoyle question their abi
lity to make good decisions. After returning to Hooli, Gavin worries about be
coming antiquated.</p>",
     '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1387194'}}},
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entation',
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     'season': 5,
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     'airdate': '2018-04-01',
     'airtime': '22:00',
     'airstamp': '2018-04-02T02:00:00+00:00',
     'runtime': 30,
     'rating': {'average': 8.1},
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scape/151/378576.jpg',
       'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/151/378576.jpg'},
     'summary': '<p>Panicked by suddenly leading a much larger team, Richard f
inds himself managing a number of small conflicts in his efforts to unite his
new employees. Dinesh celebrates a new purchase that Gilfoyle looks to spoil.
Jian-Yang goes to court. Gavin meets pushback over his signature and what it
says about him.</p>',
     '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1419259'}}},
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     'url': 'https://www.tvmaze.com/episodes/1419260/silicon-valley-5x03-chief
-operating-officer',
     'name': 'Chief Operating Officer',
     'season': 5,
     'number': 3,
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```
    'type': 'regular',
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    'airstamp': '2018-04-09T02:00:00+00:00',
    'runtime': 30,
    'rating': {'average': 8.4},
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scape/152/380370.jpg',
     'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/152/380370.jpg'},
    'summary': "<p>Encouraged by Jared to strike up a friendship with Dana, a
like-minded CEO, Richard instead finds himself charmed by Dana's COO, who cha
llenges his loyalty to Gilfoyle. Facing limited housing options thanks to his
impulse purchase, Dinesh searches for a new roommate.</p>",
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1419260'}}},
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evangelist',
    'name': 'Tech Evangelist',
    'season': 5,
    'number': 4,
    'type': 'regular',
    'airdate': '2018-04-15',
    'airtime': '22:00',
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    'runtime': 30,
    'rating': {'average': 7.6},
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scape/152/381119.jpg',
     'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/152/381119.jpg'},
    'summary': '<p>Attempting to woo a gaming company to PiperNet, Richard in
advertently angers a prized ally; Dinesh deals with a betrayal; in preparatio
n for a big launch, Gavin leaves his underlings with a cryptic message; Jared
gets inside information from Big Head.</p>',
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1436933'}}},
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    'url': 'https://www.tvmaze.com/episodes/1436934/silicon-valley-5x05-facia
l-recognition',
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    'season': 5,
    'number': 5,
    'type': 'regular',
    'airdate': '2018-04-22',
    'airtime': '22:15',
    'airstamp': '2018-04-23T02:15:00+00:00',
    'runtime': 30,
    'rating': {'average': 7.9},
    'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/152/381117.jpg',
     'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/152/381117.jpg'},
    'summary': "<p>Overshadowed by Jared in an on-camera interview, Richard's
confidence wavers further when Laurie and Monica force him to work with Eklo
w, a new artificial-intelligence company. Gilfoyle worries about the prospect
of introducing AI into Pied Piper. Dinesh makes Jared self-conscious ahead of
a second interview. Gavin questions his future beyond Hooli.</p>",
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1436934'}}},
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    'url': 'https://www.tvmaze.com/episodes/1436935/silicon-valley-5x06-artif
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icial-emotional-intelligence',
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    'airtime': '22:00',
    'airstamp': '2018-04-30T02:00:00+00:00',
    'runtime': 30,
    'rating': {'average': 7.7},
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scape/155/389559.jpg',
    'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/155/389559.jpg'},
    'summary': '<p>Richard decides to help when Laurie gets in a jam, but his
lack of emotional discipline threatens to backfire on Pied Piper. Gavin tries
to make a deal with a stubborn partner while abroad. Dinesh relishes a rare w
in. Jared bonds with a surprising figure.</p>',
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1436935'}}},
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    'url': 'https://www.tvmaze.com/episodes/1445226/silicon-valley-5x07-initi
al-coin-offering',
    'name': 'Initial Coin Offering',
    'season': 5,
    'number': 7,
    'type': 'regular',
    'airdate': '2018-05-06',
    'airtime': '22:00',
    'airstamp': '2018-05-07T02:00:00+00:00',
    'runtime': 30,
    'rating': {'average': 7.7},
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scape/155/387703.jpg',
    'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/155/387703.jpg'},
    'summary': "<p>As the Pied Piper guys prepare to close on their Series B
funding, Richard receives some unsettling news. Gilfoyle suggests a risky pro
position and Monica gets blunt with Richard. Dinesh goes to great lengths to
compete with a coworker, while Jared keeps close watch on Richard's new assis
tant. In search of a better deal, Gavin tries to charm small-town America.</p
>",
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1445226'}}},
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    'url': 'https://www.tvmaze.com/episodes/1445227/silicon-valley-5x08-fifty
-one-percent',
    'name': 'Fifty-One Percent',
    'season': 5,
    'number': 8,
    'type': 'regular',
    'airdate': '2018-05-13',
    'airtime': '22:15',
    'airstamp': '2018-05-14T02:15:00+00:00',
    'runtime': 30,
    'rating': {'average': 8.5},
    'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_land
scape/155/389554.jpg',
    'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/155/389554.jpg'},
    'summary': "<p>The launch of PiperNet finds Monica suspicious of an early
success, and the team must race against the clock as their future is threaten
```

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ed. Realizing he's made more enemies then friends, Richard makes a surprising
move.</p>",
      '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1445227'}}},
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icial-lack-of-intelligence',
     'name': 'Artificial Lack of Intelligence',
     'season': 6,
     'number': 1,
     'type': 'regular',
     'airdate': '2019-10-27',
     'airtime': '22:00',
     'airstamp': '2019-10-28T02:00:00+00:00',
     'runtime': 30,
     'rating': {'average': 7.9},
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scape/217/543706.jpg',
       'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/217/543706.jpg'},
     'summary': "<p>Richard discovers his promise to keep Pied Piper free from
collecting user data is under threat. Jared finds himself missing his role as
Richard's go-to guy and revisits the hacker hostel. Gilfoyle devises a creati
ve way to deal with Dinesh's complaining.</p>",
      '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1698000'}}},
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-money',
     'name': 'Blood Money',
     'season': 6,
     'number': 2,
     'type': 'regular',
     'airdate': '2019-11-03',
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     'runtime': 30,
     'rating': {'average': 7.8},
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scape/218/545800.jpg',
       'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/218/545800.jpg'},
     'summary': '<p>When Richard meets an interested investor with a sketchy p
ast, he must weigh his integrity against a tempting financial offer. Jared se
eks a new future, putting him at odds with Richard. A defiant Gilfoyle butts
heads with HR over his lack of direct reports. Hoover and Denpok worry when G
avin explores alternative solutions to keep a leaner Hooli afloat.</p>',
      '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1730750'}}},
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-smokes',
     'name': 'Hooli Smokes!',
     'season': 6,
     'number': 3,
     'type': 'regular',
     'airdate': '2019-11-10',
     'airtime': '22:00',
     'airstamp': '2019-11-11T03:00:00+00:00',
     'runtime': 30,
     'rating': {'average': 8.1},
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scape/218/546788.jpg',
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      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/218/546788.jpg'},
     'summary': '<p>The Pied Piper team races to close a major deal; Dinesh co
nsiders being a better person; an angry Jared reluctantly helps Richard.</p
>',
     '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1730751'}}},
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izing-alphaness',
     'name': 'Maximizing Alphaness',
     'season': 6,
     'number': 4,
     'type': 'regular',
     'airdate': '2019-11-17',
     'airtime': '22:00',
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     'runtime': 30,
     'rating': {'average': 7.8},
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scape/221/554758.jpg',
      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/221/554758.jpg'},
     'summary': "<p>Richard's authority is threatened by his former Hooli mana
ger; Monica tries to prove her support of other women; Gavin sets his sights
on the literary world.</p>",
     '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1732276'}}},
    {'id': 1757882,
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cs',
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     'season': 6,
     'number': 5,
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scape/227/568829.jpg',
      'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/227/568829.jpg'},
     'summary': "<p>Richard fumes at Gavin's new ethical stance; Dinesh's trip
turns into a nightmare; Gilfoyle and Monica work on their peer review scores.
</p>",
     '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1757882'}}},
    {'id': 1757883,
     'url': 'https://www.tvmaze.com/episodes/1757883/silicon-valley-6x06-russf
est',
     'name': 'RussFest',
     'season': 6,
     'number': 6,
     'type': 'regular',
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     'airstamp': '2019-12-02T03:00:00+00:00',
     'runtime': 30,
     'rating': {'average': 8.2},
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scape/227/568817.jpg',
```

```
        'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/227/568817.jpg'},
        'summary': "<p>A major event puts PiperNet's capabilities to the test; Mo
nica confronts Jian-Yang over his use of Pied Piper's name.</p>",
        '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1757883'}}},
        {'id': 1757884,
        'url': 'https://www.tvmaze.com/episodes/1757884/silicon-valley-6x07-exit-
event',
        'name': 'Exit Event',
        'season': 6,
        'number': 7,
        'type': 'regular',
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        'runtime': 48,
        'rating': {'average': 8.9},
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scape/230/576385.jpg',
        'original': 'https://static.tvmaze.com/uploads/images/original_untouche
d/230/576385.jpg'},
        'summary': '<p>Richard and the Pied Piper team look to pull off a spectac
ular feat on the day of a big launch.</p>',
        '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/175788
4'}}}]}}
```

```python
# Run the .keys() function on the object.
sv_json.keys()
```

```
dict_keys(['id', 'url', 'name', 'type', 'language', 'genres', 'status', 'runt
ime', 'averageRuntime', 'premiered', 'ended', 'officialSite', 'schedule', 'ra
ting', 'weight', 'network', 'webChannel', 'dvdCountry', 'externals', 'image',
'summary', 'updated', '_links', '_embedded'])
```

Questions

Based on these responses, what keys are present in the JSON. More importantly, are there any keys that don't get returned by .keys()?

```python
# First, you can see the structure after moving down a level into '_embedded'
sv_json['_embedded']
```

Out[820]:

```
{'episodes': [{'id': 10897,
    'url': 'https://www.tvmaze.com/episodes/10897/silicon-valley-1x01-minimum-
viable-product',
    'name': 'Minimum Viable Product',
    'season': 1,
    'number': 1,
    'type': 'regular',
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    'airtime': '22:00',
    'airstamp': '2014-04-07T02:00:00+00:00',
    'runtime': 30,
    'rating': {'average': 7.9},
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cape/49/123633.jpg',
    'original': 'https://static.tvmaze.com/uploads/images/original_untouched/
49/123633.jpg'},
    'summary': "<p>Attending an elaborate launch party, Richard and his comput
er programmer friends - Big Head, Dinesh and Gilfoyle - dream of making it bi
g. Instead, they're living in the communal Hacker Hostel owned by former prog
rammer Erlich, who gets to claim ten percent of anything they invent there. W
hen it becomes clear that Richard has developed a powerful compression algori
thm for his website, Pied Piper, he finds himself courted by Gavin Belson, hi
s egomaniacal corporate boss, who offers a $10 million buyout by his firm, Ho
oli. But Richard holds back when well-known investor Peter Gregory makes a co
unteroffer.</p>",
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/10897'}}},
  {'id': 10898,
    'url': 'https://www.tvmaze.com/episodes/10898/silicon-valley-1x02-the-cap-
table',
    'name': 'The Cap Table',
    'season': 1,
    'number': 2,
    'type': 'regular',
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    'airtime': '22:00',
    'airstamp': '2014-04-14T02:00:00+00:00',
    'runtime': 30,
    'rating': {'average': 9},
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cape/49/123634.jpg',
    'original': 'https://static.tvmaze.com/uploads/images/original_untouched/
49/123634.jpg'},
    'summary': "<p>After a celebratory party at the Hacker Hostel, Richard and
Erlich learn that Peter Gregory won't pay up until they deliver a viable busi
ness plan that includes a slimmed-downed staff. A desperate Richard hires for
mer Belson underling Jared, and they set about trying to trim the fat. While
Gilfoyle and Dinesh prove essential, Big Head's place in the company is less
certain.</p>",
    '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/10898'}}},
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-of-incorporation',
    'name': 'Articles of Incorporation',
    'season': 1,
    'number': 3,
    'type': 'regular',
    'airdate': '2014-04-20',
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    'runtime': 30,
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```
      'rating': {'average': 8.6},
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cape/49/123635.jpg',
        'original': 'https://static.tvmaze.com/uploads/images/original_untouched/
49/123635.jpg'},
      'summary': '<p>While Gavin Belson begins to hype Nucleus, a competing comp
ression platform, Richard learns that the name Pied Piper is already register
ed to a sprinkler company, forcing him to negotiate. Meanwhile, Erlich goes o
n a vision quest for a new company name, and Peter Gregory proves elusive whe
n one of his companies asks for money.</p>',
      '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/10899'}}},
    {'id': 10900,
      'url': 'https://www.tvmaze.com/episodes/10900/silicon-valley-1x04-fiduciar
y-duties',
      'name': 'Fiduciary Duties',
      'season': 1,
      'number': 4,
      'type': 'regular',
      'airdate': '2014-04-27',
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      'airstamp': '2014-04-28T02:00:00+00:00',
      'runtime': 30,
      'rating': {'average': 9},
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cape/49/123636.jpg',
        'original': 'https://static.tvmaze.com/uploads/images/original_untouched/
49/123636.jpg'},
      'summary': "<p>At Peter's toga party, Richard drunkenly promises to make E
rlich a board member, which he regrets the next morning. After being unassign
ed at Hooli, Big Head finds others like him who have made careers out of doin
g nothing. Richard struggles to put Pied Piper's vision into words for a pres
entation without Erlich; later, he discovers an interesting connection betwee
n Peter and Gavin Belson.</p>",
      '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/10900'}}},
    {'id': 10901,
      'url': 'https://www.tvmaze.com/episodes/10901/silicon-valley-1x05-signalin
g-risk',
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ogo, with controversial results. Jared tries to make the company more efficie
nt. After Gavin Belson and Peter Gregory unexpectedly come face-to-face, Rich
ard learns that he only has eight weeks to prepare for a live demo at TechCru
nch Disrupt.</p>",
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a hacker with a notorious reputation, to help with Pied Piper\'s cloud. Jared
finds himself taken for a ride when he seeks out Peter Gregory\'s signature.
Erlich and Dinesh compete for the attention of Tara, Gilfoyle\'s visiting gir
lfriend. Later, Dinesh faces a sexual dilemma.</p>',
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    'summary': "<p>At TechCrunch Disrupt, Richard feels the pressure to finish
his demo, but finds himself distracted by a girl he dated briefly, who's now
spreading rumors about him. Jared worries that Monica is taking his place in
the company. Dinesh develops a crush on a girl at a neighboring booth. Erlic
h's scandalous past connection to one of the judges threatens Pied Piper's ch
ances.</p>",
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    'summary': '<p>Poised to compete at TechCrunch Disrupt, the guys of Pied P
iper become worried after an impressive presentation by Gavin Belson. As Jare
d tries to pivot the company, Richard is inspired to make big changes at the
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            last minute.</p>',
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    ned by every venture capitalist under the sun, while Monica adjusts to a new
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          'summary': "<p>Pied Piper could go under if Richard and the guys can't fin
    d legal and financial help in the wake of Hooli's bombshell. Meanwhile, Dines
    h tries to thwart a fund-raising campaign for his cousin's new app; and Monic
    a tries to keep her interest in Pied Piper separate from her job.</p>",
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          'summary': "<p>Richard mulls a proposal by Gavin, but also considers a pit
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ch from Russ Hanneman about backing Pied Piper. Meanwhile, Monica learns surp
rising news about Richard's deal with Hooli; and Gilfoyle and Dinesh go to ex
tremes to get what they want.</p>",
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   'summary': '<p>Richard butts heads with Erlich over a prospective hire, wh
ile Dinesh and Gilfoyle become suspicious that a new employee they recommende
d is commanding a higher salary. Big Head gets a surprising promotion at Hool
i. At a board meeting, Monica and Richard find themselves outvoted; Jared ins
titutes a workplace harassment policy.</p>',
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   'summary': "<p>Gavin creates interference that hinders Pied Piper's expans
ion. Meanwhile, the guys could be threatened by a nosy neighbor; Guilfoyle se
ts out to build servers; Richard's reluctant to let Jared move in; and Big He
ad's leadership skills are suspect.</p>",
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illionaire when Monica urges the guys to pursue a livestream opportunity, but
Richard learns their friendship isn't what Erlich thinks it is. Meanwhile, Ja
red wants Carla and Monica to be friends.</p>",
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49/123623.jpg'},
    'summary': "<p>The team fields job offers and Russ is distracted by financ
ial news, but Richard realizes Pied Piper could fold if it doesn't merge with
a hated rival. Meanwhile, Dinesh tries to woo a woman online; and Gavin looks
on the bright side of Nucleus' failure.</p>",
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    'summary': "<p>Richard gets paranoid about security after he takes pity on
a competitor and inadvertently starts a feud. Meanwhile, Jared fibs about Pie
d Piper's size; and Gavin looks for a scapegoat when he feels pressure from b
oard members.</p>",
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ding arbitration, but Richard worries that his rival's claims could have meri
t. Meanwhile, Jared, Dinesh and Gilfoyle debate a philosophical theory; and B
ig Head gets a boost.</p>",
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s-of-the-condor',
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pected real-life drama draws a spike in traffic to their livestream and leave
s them fighting to hold things together - literally. While Erlich considers h
is future, Richard scrambles to save Pied Piper's.</p>",
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tough decision: accept the diminished role of CTO, or leave Pied Piper for go
od. Erlich takes a shine to Jack Barker, Laurie's new choice of CEO, while Di
nesh and Gilfoyle weigh their options in Richard's absence. At Hooli, Gavin t
ries to improve his image by admitting failure, and Big Head gets wind of maj
or changes.</p>",
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le, but worries Richard; Jared and Erlich both face housing issues; Gavin sug
gests a controversial move.</p>',
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elf up to recruiters; Dinesh draws unwanted attention from a recent purchase.
</p>',
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ompetition; Monica takes a stand; Gavin makes a decision about Nucleus.</p>',
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h, Gilfoyle and Jared misplace hardware; Erlich pitches his plans to Big Hea
d.</p>',
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ead and Erlich's launch party has snags; Dinesh falls for a foreign coworker.
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cape/61/152985.jpg',
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per, they receive an unexpected response. With a limited number of beta invit
es each, Dinesh worries about his lack of friends, while Gilfoyle looks to ca
tch him in a lie. Monica worries about how to deliver criticism. Facing finan
cial woes, Erlich considers a big decision, and Gavin challenges the Nucleus
team to do the impossible.</p>',
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s-earnings-over-ride',
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61/154296.jpg'},
      'summary': "<p>Erlich struggles to come clean to Richard, who is forced to
make a choice between their friendship and the company's future. Jared's new
Pied Piper apparel makes a splash, and divides Dinesh and Gilfoyle. As Gavin
faces major life changes, the guys celebrate a rare victory.</p>",
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ctive-users',
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62/155043.jpg'},
      'summary': '<p>Upon discovering surprising stats, Richard attempts to brid
ge the gap between Pied Piper and its users, leading Jared to take drastic me
asures to hold everything together. Gavin learns secrets about the competitio
n and decides to bring in a new face to reclaim his former glory.</p>',
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ccess leaves Richard in a moral quandary, just as Dinesh's video-chat app gat
hers speed. While Laurie prepares to jump ship, Gavin's comeback at Hooli is
threatened by his displays of grandeur.</p>",
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uggle to find funding for Pied Piper's video-chat app to keep up with their r
apidly growing user base. Erlich faces resistance from Big Head's dad, while
Gavin balks after Jack steps on his toes at Hooli. Having a hard time adjusti
ng to his company's pivot, Richard gets sage advice from an unexpected sourc
e, leading him to a big idea that could change his future.</p>",
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his head. Later, Richard discovers interesting data about PiperChat's users.
Erlich makes a play to be involved in Jian-Yang's new app; Jared sets ground
rules in his friendship with Richard; Gavin's paranoia over Jack's enthusiasm
causes him to make a rash decision.</p>",
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while trying to move ahead with his next big idea. Eyeing a comeback, Erlich
pressures an uncooperative Jian-Yang. Monica sets a trap at Raviga to improve
her standing with Laurie. Dinesh goes on a date; Big Head enters the world of
academia; Gavin faces an unknown future.</p>',
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about the company he's keeping. Gilfoyle gets tough on security in the wake o
f Dinesh's latest dalliance; later, he considers whether to put his pride asi
de for a job. Concerned about Jian-Yang's commitment to his app, Erlich takes
matters into his own hands.</p>",
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when he's forced to deal with an unexpected interloper. As things get more se
rious, Dinesh scrambles to find a way out of his new relationship. After lear
ning of surprising developments afoot at Raviga, Monica has trouble deciding
which horse to back.</p>",
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e tech bubble, and crosses paths with a contentious figure from Pied Piper's
past. Erlich reaches out to Monica and Laurie in search of a new endeavor. A
launch gone wrong finds Dinesh and Gilfoyle at war as Jared tries to keep the
peace.</p>",
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iance ends up coming back to haunt him. Gilfoyle goes to desperate measures t
o battle Jian-Yang's new smart fridge. Jared embraces multiple identities in
his quest to reduce costs. Erlich tries to hang with the alpha males.</p>",
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n to Erlich for help in garnering a deal with Keenan Feldspar, Silicon Valley
\'s latest "it" boy — but when Keenan makes a too-good-to-resist offer, Richa
rd must weigh Pied Piper\'s future against a potential mutiny. Jack faces set
backs while preparing for Hooli-Con.</p>',
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t; Jack bets big; Gavin plots a comeback.</p>',
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pressure to get things right stymies Richard and forces him to grow the compa
ny in a way he hadn't planned. A picky Dinesh and Gilfoyle question their abi
lity to make good decisions. After returning to Hooli, Gavin worries about be
coming antiquated.</p>",
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nds himself managing a number of small conflicts in his efforts to unite his
new employees. Dinesh celebrates a new purchase that Gilfoyle looks to spoil.
Jian-Yang goes to court. Gavin meets pushback over his signature and what it
says about him.</p>',
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like-minded CEO, Richard instead finds himself charmed by Dana's COO, who cha
llenges his loyalty to Gilfoyle. Facing limited housing options thanks to his
impulse purchase, Dinesh searches for a new roommate.</p>",
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dvertently angers a prized ally; Dinesh deals with a betrayal; in preparation
for a big launch, Gavin leaves his underlings with a cryptic message; Jared g
ets inside information from Big Head.</p>',
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   confidence wavers further when Laurie and Monica force him to work with Eklo
   w, a new artificial-intelligence company. Gilfoyle worries about the prospect
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   in. Jared bonds with a surprising figure.</p>',
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unding, Richard receives some unsettling news. Gilfoyle suggests a risky prop
osition and Monica gets blunt with Richard. Dinesh goes to great lengths to c
ompete with a coworker, while Jared keeps close watch on Richard's new assist
ant. In search of a better deal, Gavin tries to charm small-town America.</p
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success, and the team must race against the clock as their future is threaten
ed. Realizing he's made more enemies then friends, Richard makes a surprising
move.</p>",
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collecting user data is under threat. Jared finds himself missing his role as
Richard's go-to guy and revisits the hacker hostel. Gilfoyle devises a creati
ve way to deal with Dinesh's complaining.</p>",
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st, he must weigh his integrity against a tempting financial offer. Jared see
ks a new future, putting him at odds with Richard. A defiant Gilfoyle butts h
eads with HR over his lack of direct reports. Hoover and Denpok worry when Ga
vin explores alternative solutions to keep a leaner Hooli afloat.</p>',
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siders being a better person; an angry Jared reluctantly helps Richard.</p>',
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er; Monica tries to prove her support of other women; Gavin sets his sights o
n the literary world.</p>",
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    'runtime': 30,

```
        'rating': {'average': 8},
        'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_lands
    cape/227/568829.jpg',
         'original': 'https://static.tvmaze.com/uploads/images/original_untouched/
    227/568829.jpg'},
        'summary': "<p>Richard fumes at Gavin's new ethical stance; Dinesh's trip
    turns into a nightmare; Gilfoyle and Monica work on their peer review scores.
    </p>",
        '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1757882'}}},
      {'id': 1757883,
        'url': 'https://www.tvmaze.com/episodes/1757883/silicon-valley-6x06-russfe
    st',
        'name': 'RussFest',
        'season': 6,
        'number': 6,
        'type': 'regular',
        'airdate': '2019-12-01',
        'airtime': '22:00',
        'airstamp': '2019-12-02T03:00:00+00:00',
        'runtime': 30,
        'rating': {'average': 8.2},
        'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_lands
    cape/227/568817.jpg',
         'original': 'https://static.tvmaze.com/uploads/images/original_untouched/
    227/568817.jpg'},
        'summary': "<p>A major event puts PiperNet's capabilities to the test; Mon
    ica confronts Jian-Yang over his use of Pied Piper's name.</p>",
        '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1757883'}}},
      {'id': 1757884,
        'url': 'https://www.tvmaze.com/episodes/1757884/silicon-valley-6x07-exit-e
    vent',
        'name': 'Exit Event',
        'season': 6,
        'number': 7,
        'type': 'regular',
        'airdate': '2019-12-08',
        'airtime': '22:05',
        'airstamp': '2019-12-09T03:05:00+00:00',
        'runtime': 48,
        'rating': {'average': 8.9},
        'image': {'medium': 'https://static.tvmaze.com/uploads/images/medium_lands
    cape/230/576385.jpg',
         'original': 'https://static.tvmaze.com/uploads/images/original_untouched/
    230/576385.jpg'},
        'summary': '<p>Richard and the Pied Piper team look to pull off a spectacu
    lar feat on the day of a big launch.</p>',
        '_links': {'self': {'href': 'https://api.tvmaze.com/episodes/1757884'}}}]]
```

Some keys present in the json are id, url, name, type, and language. There are keys that don't get returned by the .keys() function. Some of those include airdate, airtime, airstamp.

Question 7: [4 points] Get the day the show premiered.

```python
In [821…   def get_airdate_first_episode():
             premiered_day = sv_json['premiered']
             return premiered_day; #replace this with the correct statements

           # print(get_airdate_first_episode())
```

Question 8: [4 points] Get the summary of a specific episode.

In [822…
```python
def get_summary(season, episode):
    summary = None
    for ep in sv_json['_embedded']['episodes']:
        episode_number = ep['number']
        episode_season = ep['season']
        episode_summary = ep['summary']
        if episode_number == episode and episode_season == season:
            # print(season, episode, episode_season, episode_number, episode_su
            summary = episode_summary

    return summary;

print(get_summary(2, 4))
```

<p>Richard butts heads with Erlich over a prospective hire, while Dinesh and G
ilfoyle become suspicious that a new employee they recommended is commanding a
higher salary. Big Head gets a surprising promotion at Hooli. At a board meeti
ng, Monica and Richard find themselves outvoted; Jared institutes a workplace
harassment policy.</p>

In [ ]: