Letting go of early 2000's Avril Lavigne

This is me (hey! I'm Éléonore Mayola) coming to you with a crucial investigation into what happened to Avril Lavigne in the early 2000's.

This announcement might surprise you if, unlike me, you haven't wandered down the comments under one of her early YouTube video. That's where I discovered a specific group of Lavigne fans are convinced she passed away in 2003 and was replaced by a lookalike [1,2].

It is a fact that Avril Lavigne changed in both her music and style, but who doesn't change over time. The explanation being that transformation is very unlikely to be so dramatic, but then what happened? While it is tricky to account for her personal /internal evolution, some of her musical influences (such as her support band and producing partners) can be looked at to find a correlation with her visible transformation (music and style).

[6]

Avril Lavigne's albums popularity decreased especially after the 3rd album. This third album seems different musically (tempo, energy, speechiness) and has songs viewed as part of a style called "Bubblegum Pop". It was made after she left Arista Records, and after the biggest musicians turnover in her backing band. While her style (hair, clothes) started to change between the two first albums (released in 2002 and 2004), which is consistent with her leaving teenagehood, her biggest musical change happened on the third album (2007). This change in both style and music has lost her a part of her fans. And it could obviously not be explained by the artist being replaced in 2003.

```
In [1]: import pandas as pd
        import altair as alt
        alt.renderers.enable('notebook')
Out[1]: RendererRegistry.enable('notebook')
```

Avril Lavigne studio albums data

[3, 4]

In [3]:
```python
al_albums = [
    {"name": "Let Go", "year": 2002, "genre": ["Alternative rock","Pop punk"], "global_sales": 16000000,
     "billboard200_debut": 2, "label": ["Arista Records"],
     "producers": ["L.A. Reid", "The Matrix", "Clif Magness", "Curt Frasca", "Peter Zizzo"]},
    {"name": "Under My Skin", "year": 2004, "genre": ["Alternative rock","Pop punk"], "global_sales": 10000000,
     "billboard200_debut": 1, "label": ["Arista Records", "RCA Records"],
     "producers": ["Raine Maida", "Don Gilmore", "Butch Walker"]},
    {"name": "The Best Damn Thing", "year": 2007, "genre": ["Bubblegum pop","Pop punk"], "global_sales": 6000000,
     "billboard200_debut": 1, "label": ["RCA Records"],
     "producers": ["Avril Lavigne", "Deryck Whibley", "Butch Walker", "Rob Cavallo", "Dr. Luke",
                   "The Submarines", "Jesse Welch", "Steven Wolf"]},
    {"name": "Goodbye Lullaby", "year": 2011, "genre": ["Pop rock"], "global_sales": 2000000,
     "billboard200_debut": 4, "label": ["RCA Records"],
     "producers": ["Avril Lavigne", "Deryck Whibley", "Butch Walker", "Max Martin", "Shellback"]},
    {"name": "Avril Lavigne", "year": 2013, "genre": ["Pop", "Pop rock"], "global_sales": 650000,
     "billboard200_debut": 5, "label": ["Epic Records"],
     "producers": ["Avril Lavigne", "L.A. Reid", "Martin Johnson", "Peter Svensson",
                   "David Hodges", "Matt Squire", "Chad Kroeger"]},
    {"name": "Head Above Water", "year": 2019, "genre": ["Pop rock"], "global_sales": None,
     "billboard200_debut": 13, "label": ["BMG"],
     "producers": ["Avril Lavigne", "Stephan Moccio", "Chris Baseford", "Johan Carlsson",
                   "Lauren Christy", "Ryan Cabrera", "Chad Kroeger"]}
]
```

In [4]:
```python
df_albums = pd.DataFrame(al_albums)
```

In [5]:
```python
df_albums
```

Out[5]:

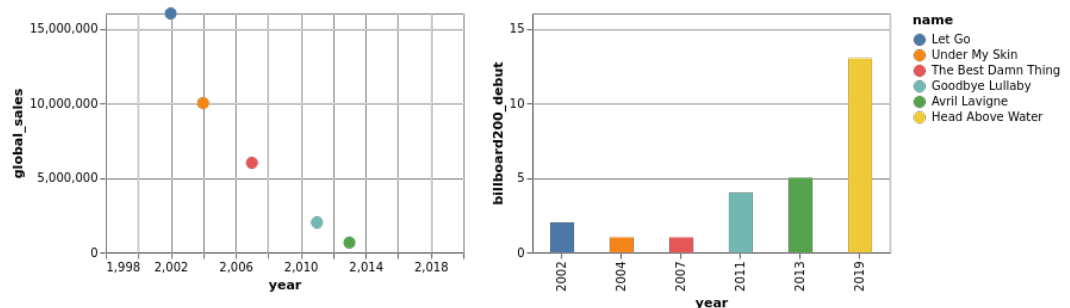|	name	year	genre	global_sales	billboard200_debut	label	producers
0	Let Go	2002	[Alternative rock, Pop punk]	16000000.0	2	[Arista Records]	[L.A. Reid, The Matrix, Clif Magness, Curt Fra...
1	Under My Skin	2004	[Alternative rock, Pop punk]	10000000.0	1	[Arista Records, RCA Records]	[Raine Maida, Don Gilmore, Butch Walker]
2	The Best Damn Thing	2007	[Bubblegum pop, Pop punk]	6000000.0	1	[RCA Records]	[Avril Lavigne, Deryck Whibley, Butch Walker, ...
3	Goodbye Lullaby	2011	[Pop rock]	2000000.0	4	[RCA Records]	[Avril Lavigne, Deryck Whibley, Butch Walker, ...
4	Avril Lavigne	2013	[Pop, Pop rock]	650000.0	5	[Epic Records]	[Avril Lavigne, L.A. Reid, Martin Johnson, Pet...
5	Head Above Water	2019	[Pop rock]	NaN	13	[BMG]	[Avril Lavigne, Stephan Moccio, Chris Baseford...

Albums sales and debut in US charts

In [6]:
```python
chart1 = alt.Chart(df_albums, width=300, height=200).mark_point(size=100, fill
ed=True, opacity=1).encode(
    alt.X('year',
        scale=alt.Scale(domain=(1999, 2019))
    ),
    y='global_sales:Q',
    color=alt.Color('name', sort=['year'])
)

chart2 = alt.Chart(df_albums, width=300, height=200).mark_bar(size=20).encode(
    x='year:O',
    y=alt.Y('billboard200_debut:Q',
        scale=alt.Scale(domain=(0, 15))),
    color=alt.Color('name', sort=['year'])
)

chart1 | chart2
```

Out[6]:

=> A.L. studio albums global sales decreased with time

=> A.L. studio albums US chart debut worsened with time

In [7]:
```python
albums_selection = df_albums[["year", "label", "producers"]]

pd.set_option('max_colwidth', 120)

albums_selection
```
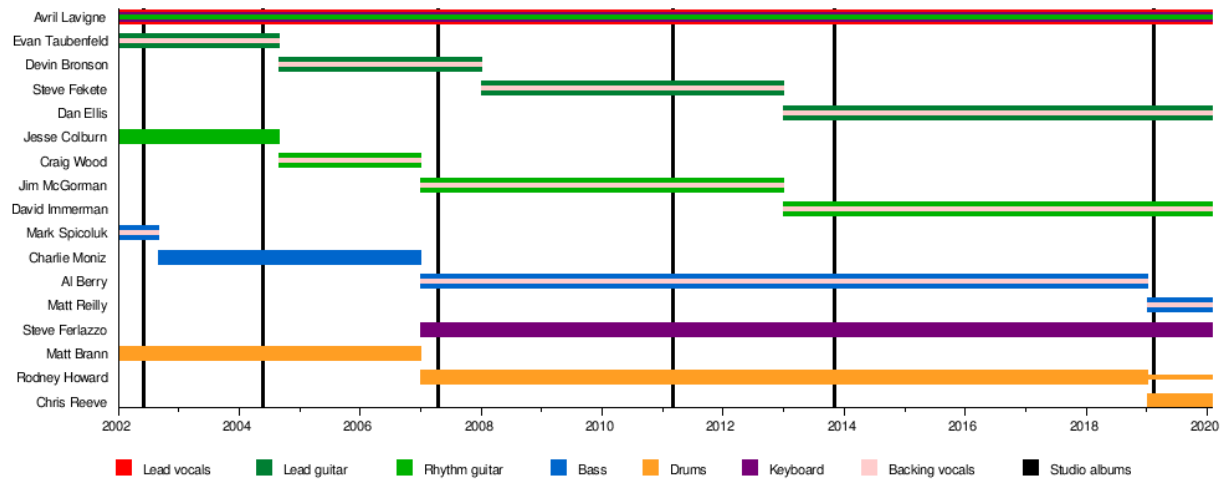
Out[7]:

	year	label	producers
0	2002	[Arista Records]	[L.A. Reid, The Matrix, Clif Magness, Curt Frasca, Peter Zizzo]
1	2004	[Arista Records, RCA Records]	[Raine Maida, Don Gilmore, Butch Walker]
2	2007	[RCA Records]	[Avril Lavigne, Deryck Whibley, Butch Walker, Rob Cavallo, Dr. Luke, The Submarines, Jesse Welch, Steven Wolf]
3	2011	[RCA Records]	[Avril Lavigne, Deryck Whibley, Butch Walker, Max Martin, Shellback]
4	2013	[Epic Records]	[Avril Lavigne, L.A. Reid, Martin Johnson, Peter Svensson, David Hodges, Matt Squire, Chad Kroeger]
5	2019	[BMG]	[Avril Lavigne, Stephan Moccio, Chris Baseford, Johan Carlsson, Lauren Christy, Ryan Cabrera, Chad Kroeger]

=> Frequent change of producers, changed labels several time

Avril Lavigne's backing band

[3]

- 2nd album (2004): 1 new musician (since the previous album)
- 3rd album (2007): 6 new musicians
- 4th album (2011): 1 new musician
- 5th album (2013): 2 new musicians
- 6th album (2019): 2 new musicians

=> There is no one left from the original band, they stayed for the first or two first albums

The 3rd album has the most new band members.

Avril Lavigne's songs

[5]

```
In [8]: al_df = pd.read_csv('lavigne_spotify_list.csv')
```

```
In [9]: # Keep tracks from studio albums
        selection = al_df.loc[al_df.year.isin(df_albums.year)]
```

In [10]: `selection.head()`

Out[10]:

	tracks	title	artist	top genre	year	added	bpm	nrgy	dnce	dB	live	val	dur	acous	sp
0	1	Complicated	Avril Lavigne	canadian pop	2002	2011-11-30	78	78	59	-6	30	43	245	6	
1	2	Sk8er Boi	Avril Lavigne	canadian pop	2002	2011-11-30	150	90	49	-4	36	48	204	0	
2	3	What the Hell	Avril Lavigne	canadian pop	2011	2011-11-30	150	93	58	-4	14	88	221	0	
3	4	Girlfriend	Avril Lavigne	canadian pop	2007	2011-11-30	164	96	56	-2	21	67	217	0	
4	5	I'm with You	Avril Lavigne	canadian pop	2002	2011-11-30	152	41	46	-7	12	21	223	8	

In [11]:
```python
# Add an 'album' column
albums_content = {
    "album1": {"name": "Let Go",
               "songs": ["Losing Grip", "Complicated", "Sk8er Boi", "I'm with
You", "Mobile", "Unwanted",
                         "Tomorrow", "Anything but Ordinary", "Things I'll Nev
er Say", "My World",
                         "Nobody's Fool", "Too Much to Ask", "Naked"]},
    "album2": {"name": "Under My Skin",
               "songs": ["Take Me Away", "Together", "Don't Tell Me", "He Wasn
't",
                         "How Does It Feel", "My Happy Ending", "Nobody's Hom
e", "Forgotten",
                         "Who Knows", "Fall to Pieces", "Freak Out", "Slipped
Away"]},
    "album3": {"name": "The Best Damn Thing",
               "songs": ["Girlfriend", "I Can Do Better", "Runaway", "The Best
Damn Thing",
                         "When You're Gone", "Everything Back but You", "Hot",
"Innocence",
                         "I Don't Have to Try", "One of Those Girls", "Contagi
ous", "Keep Holding On"]},
    "album4": {"name": "Goodbye Lullaby",
               "songs": ["Black Star", "What the Hell", "Push", "Wish You Were
Here", "Smile",
                         "Stop Standing There", "I Love You", "Everybody Hurt
s", "Not Enough",
                         "4 Real", "Darlin", "Remember When", "Goodbye", "Alic
e"]},
    "album5": {"name": "Avril Lavigne",
               "songs": ["Rock n Roll", "Here's to Never Growing Up", "17", "B
itchin' Summer",
                         "Let Me Go", "Give You What You Like", "Bad Girl", "H
ello Kitty",
                         "You Ain't Seen Nothin' Yet", "Sippin' On Sunshine",
"Hello Heartache",
                         "Falling Fast", "Hush Hush"]},
    "album6": {"name": "Head Above Water",
               "songs": ["Head Above Water", "Birdie", "I Fell in Love with th
e Devil",
                         "Tell Me It's Over", "Mailbox", "Dumb Blonde", "It Wa
s In Me",
                         "Souvenir", "Crush", "Goddess", "Bigger Wow", "Love M
e Insane", "Warrior"]}
    }
```

In [12]:
```python
import string

def clean_song_title(song_title):
    song_title = song_title.lower()
    if "-" in song_title:
        song_title = song_title.split(" - ")[0]
    return song_title
```

In [13]:
```python
for k, v in albums_content.items():
    v["songs"] = [clean_song_title(song) for song in v["songs"]]
```

In [14]:
```python
def get_album_names(title):
    title = clean_song_title(title)
    if title in albums_content["album1"]["songs"]:
        return albums_content["album1"]["name"]
    if title in albums_content["album2"]["songs"]:
        return albums_content["album2"]["name"]
    if title in albums_content["album3"]["songs"]:
        return albums_content["album3"]["name"]
    if title in albums_content["album4"]["songs"]:
        return albums_content["album4"]["name"]
    if title in albums_content["album5"]["songs"]:
        return albums_content["album5"]["name"]
    if title in albums_content["album6"]["songs"]:
        return albums_content["album6"]["name"]
```

In [44]:
```python
selection.assign(album="")
```

Out[44]:

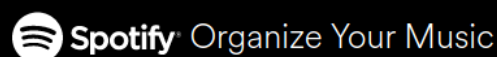|	tracks	title	artist	top genre	year	added	bpm	nrgy	dnce	dB	live	val	dur	acous	
0	1	Complicated	Avril Lavigne	canadian pop	2002	2011-11-30	78	78	59	-6	30	43	245	6	
1	2	Sk8er Boi	Avril Lavigne	canadian pop	2002	2011-11-30	150	90	49	-4	36	48	204	0	
2	3	What the Hell	Avril Lavigne	canadian pop	2011	2011-11-30	150	93	58	-4	14	88	221	0	
3	4	Girlfriend	Avril Lavigne	canadian pop	2007	2011-11-30	164	96	56	-2	21	67	217	0	
4	5	I'm with You	Avril Lavigne	canadian pop	2002	2011-11-30	152	41	46	-7	12	21	223	8	
5	6	When You're Gone	Avril Lavigne	canadian pop	2007	2011-11-30	142	72	46	-4	23	17	240	19	
6	7	My Happy Ending	Avril Lavigne	canadian pop	2004	2011-11-30	170	94	41	-2	37	74	242	0	
7	8	Wish You Were Here	Avril Lavigne	canadian pop	2011	2011-11-30	166	87	45	-4	19	34	226	3	
8	9	Keep Holding On	Avril Lavigne	canadian pop	2007	2011-11-30	161	79	27	-2	14	15	240	4	
9	10	Smile	Avril Lavigne	canadian pop	2011	2011-11-30	105	85	63	-4	7	65	210	0	
10	11	Nobody's Home	Avril Lavigne	canadian pop	2004	2011-11-30	185	91	35	-4	16	18	212	0	
11	12	Hot	Avril Lavigne	canadian pop	2007	2011-11-30	145	94	60	-4	36	47	203	2	
12	13	Don't Tell Me	Avril Lavigne	canadian pop	2004	2011-11-30	144	80	52	-3	36	48	202	0	
13	14	Innocence	Avril Lavigne	canadian pop	2007	2011-11-30	138	71	39	-4	20	34	232	15	
14	15	Losing Grip	Avril Lavigne	canadian pop	2002	2011-11-30	158	89	53	-5	8	58	234	0	
15	16	Things I'll Never Say	Avril Lavigne	canadian pop	2002	2011-11-30	102	81	57	-5	14	59	224	0	
16	17	Fall To Pieces	Avril Lavigne	canadian pop	2004	2011-11-30	178	90	43	-3	63	49	209	0	
17	18	The Best Damn Thing	Avril Lavigne	canadian pop	2007	2011-11-30	165	94	56	-2	15	88	189	0	
18	19	Anything but Ordinary	Avril Lavigne	canadian pop	2002	2011-11-30	123	67	65	-6	9	64	251	4	
19	20	Everybody Hurts	Avril Lavigne	canadian pop	2011	2011-11-30	102	75	45	-4	12	36	222	1	
20	21	I Love You	Avril Lavigne	canadian pop	2011	2011-11-30	107	80	60	-4	32	51	242	2	
21	22	Slipped Away	Avril Lavigne	canadian pop	2004	2011-11-30	161	62	45	-4	12	10	214	0	
22	23	Alice - Extended Version	Avril Lavigne	canadian pop	2011	2011-11-30	119	82	54	-4	17	17	301	5	
23	24	Tomorrow	Avril Lavigne	canadian pop	2002	2011-11-30	136	79	63	-7	16	61	229	1	
24	25	Take Me Away	Avril Lavigne	canadian pop	2004	2011-11-30	99	89	51	-2	20	26	178	0	
25	26	He Wasn't	Avril Lavigne	canadian pop	2004	2011-11-30	173	86	41	-4	8	66	179	0	
26	27	Nobody's Fool	Avril Lavigne	canadian pop	2002	2011-11-30	90	88	50	-6	13	46	237	0	

In [47]:
```python
for idx, row in selection.iterrows():
    album_name = get_album_names(row.title)
    selection.loc[idx, "album"] = album_name
```

In [48]:
```python
selection.head()
```

Out[48]:

	tracks	title	artist	top genre	year	added	bpm	nrgy	dnce	dB	live	val	dur	acous	sp
0	1	Complicated	Avril Lavigne	canadian pop	2002	2011-11-30	78	78	59	-6	30	43	245	6	
1	2	Sk8er Boi	Avril Lavigne	canadian pop	2002	2011-11-30	150	90	49	-4	36	48	204	0	
2	3	What the Hell	Avril Lavigne	canadian pop	2011	2011-11-30	150	93	58	-4	14	88	221	0	
3	4	Girlfriend	Avril Lavigne	canadian pop	2007	2011-11-30	164	96	56	-2	21	67	217	0	
4	5	I'm with You	Avril Lavigne	canadian pop	2002	2011-11-30	152	41	46	-7	12	21	223	8	

In [56]:
```python
# Remove songs that haven't been associated to an album
songs_data = selection.loc[selection["album"].notnull()]
```


Spotify Organize Your Music

The Track Properties

Organize Your Music can help you slice and dice your music collection by a wide range of properties:

1. **Genre** - the genre of the track
2. **Year** - the release year of the recording. Note that due to vagaries of releases, re-releases, re-issues and general madness, sometimes the release years are not what you'd expect.
3. **Added** - the earliest date you added the track to your collection.
4. **Beats Per Minute (BPM)** - The tempo of the song.
5. **Energy** - The energy of a song - the higher the value, the more energtic. song
6. **Danceability** - The higher the value, the easier it is to dance to this song.
7. **Loudness (dB)** - The higher the value, the louder the song.
8. **Liveness** - The higher the value, the more likely the song is a live recording.
9. **Valence** - The higher the value, the more positive mood for the song.
10. **Length** - The duration of the song.
11. **Acousticness** - The higher the value the more acoustic the song is.
12. **Speechiness** - The higher the value the more spoken word the song contains.
13. **Popularity** - The higher the value the more popular the song is.
14. **Duration** - The length of the song.

In [82]:
```python
# Tempo (BPM)
chart3 = alt.Chart(songs_data, width=200, height=200).mark_boxplot(opacity=0.
7).encode(
    x='year:O',
    y='bpm:Q',
    color=alt.Color('album', sort=['year']),
    tooltip=['title', 'bpm']
).interactive()

# Energy
chart4 = alt.Chart(songs_data, width=200, height=200).mark_boxplot(opacity=0.
7).encode(
    x='year:O',
    y='nrgy:Q',
    color=alt.Color('album', sort=['year']),
    tooltip=['title', 'nrgy']
).interactive()

# Danceability
chart5 = alt.Chart(songs_data, width=200, height=200).mark_boxplot(opacity=0.
7).encode(
    x='year:O',
    y='dnce:Q',
    color=alt.Color('album', sort=['year']),
    tooltip=['title', 'dnce']
).interactive()

# Positive Mood (Valence)
chart6 = alt.Chart(songs_data, width=300, height=300).mark_boxplot(opacity=0.
7).encode(
    x='year:O',
    y='val:Q',
    color=alt.Color('album', sort=['year']),
    tooltip=['title', 'val']
).interactive()

# Acousticness
chart7 = alt.Chart(songs_data, width=300, height=300).mark_boxplot(opacity=0.
7).encode(
    x='year:O',
    y='acous:Q',
    color=alt.Color('album', sort=['year']),
    tooltip=['title', 'acous']
).interactive()

# Speechiness
chart8 = alt.Chart(songs_data, width=300, height=300).mark_boxplot(opacity=0.
7).encode(
    x='year:O',
    y='spch:Q',
    color=alt.Color('album', sort=['year']),
    tooltip=['title', 'spch']
).interactive()

# Popularity
chart9 = alt.Chart(songs_data, width=300, height=300).mark_boxplot(opacity=0.
7).encode(
    x='year:O',
    y='pop:Q',
    color=alt.Color('album', sort=['year']),
    tooltip=['title', 'pop']
).interactive()
```
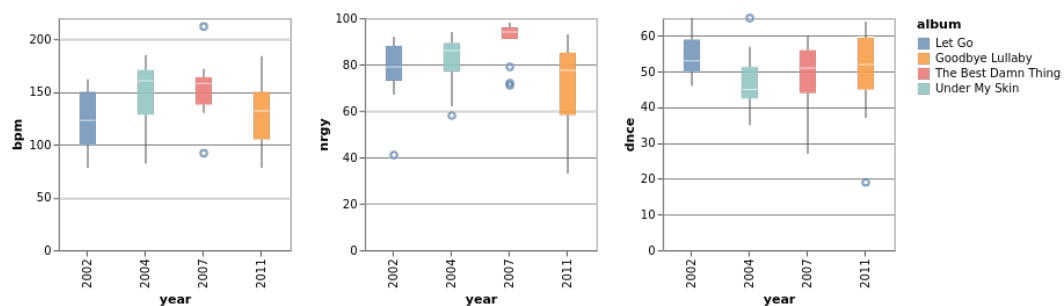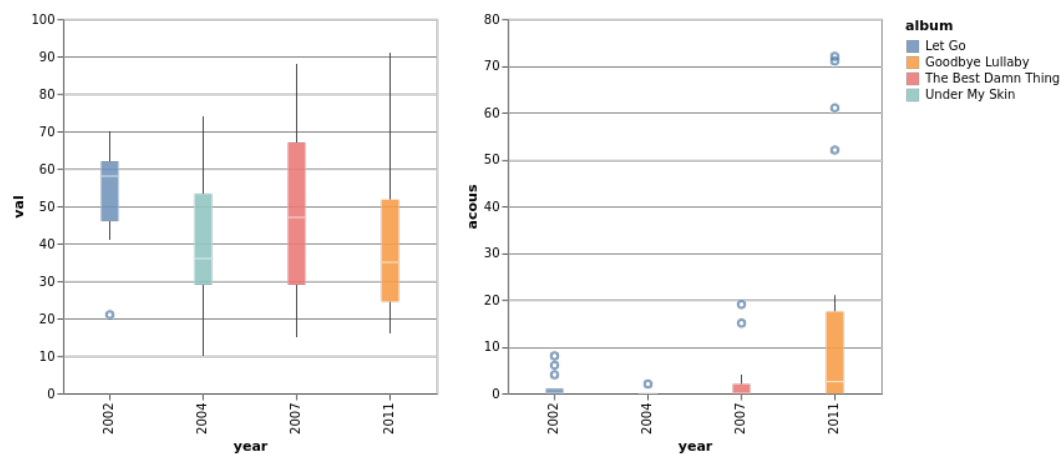
In [86]: `# Tempo (BPM) | Energy | Danceability`
`chart3 | chart4 | chart5`

Out[86]:
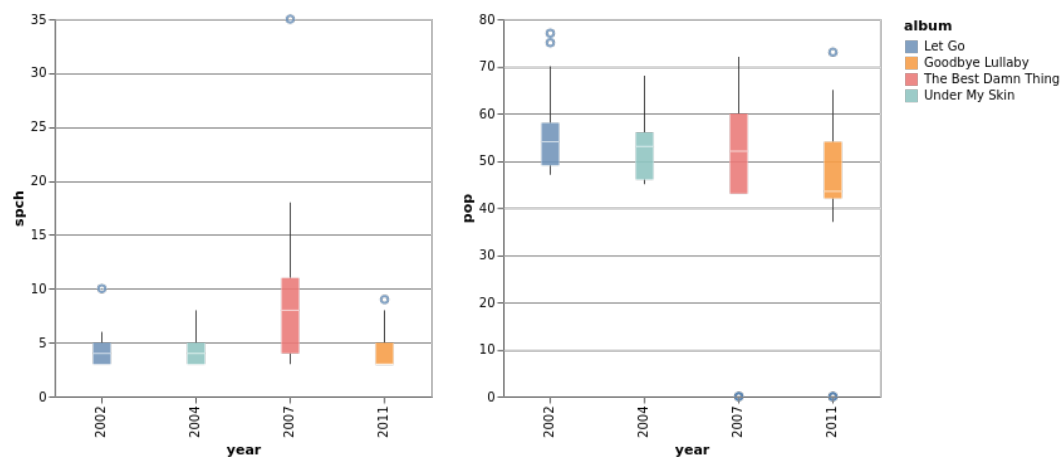

In [84]: `# Positive Mood (Valence) | # Acousticness`
`chart6 | chart7`

Out[84]:

In [85]: `# Speechiness | Popularity`
`chart8 | chart9`

Out[85]:

=> Musically, songs from the 3rd record seem more upbeat (as reflected by their BPM and energy) and have more lyrics. Songs on the 4th album are more acoustic.

Using songs from an open Spotify playlist [5] shows the 1st and 2nd album are more similar (energy, acousticness, speechiness and popularity) and the 1st and fourth album are also quite close (BPM, danceability and speechiness).

It'd be interesting to try this analysis on songs from the 2 last studio albums.

References

Conspiracy

- [1] https://www.theguardian.com/lifeandstyle/shortcuts/2017/may/15/avril-lavigne-melissa-cloning-conspiracy-theories (https://www.theguardian.com/lifeandstyle/shortcuts/2017/may/15/avril-lavigne-melissa-cloning-conspiracy-theories)
- [2] https://avrilestamorta.blogspot.com/ (https://avrilestamorta.blogspot.com/)

Data for analysis

- [3] https://en.wikipedia.org/wiki/Avril_Lavigne (https://en.wikipedia.org/wiki/Avril_Lavigne)
- [4] https://en.wikipedia.org/wiki/Avril_Lavigne_discography (https://en.wikipedia.org/wiki/Avril_Lavigne_discography)
- [5] spotify open playlist : https://open.spotify.com/playlist/4i9NgLPXnTQsLYrzrq6WhE (https://open.spotify.com/playlist/4i9NgLPXnTQsLYrzrq6WhE) analyzed using http://organizeyourmusic.playlistmachinery.com (http://organizeyourmusic.playlistmachinery.com)

Other

- [6] photos: https://avrillavigne.com/music/ (https://avrillavigne.com/music/)
- MTV docu, 2007: https://www.youtube.com/watch?v=f8GLe10jLSw (https://www.youtube.com/watch?v=f8GLe10jLSw)

In [ ]: