Kickstarter Projects

TODO: what is kickstarter...

1.Data preparation and cleaning

Import Python Libraries

In [1]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from IPython.display import display
import seaborn as sns

# need to install
#conda install -c konstantinstadler country_converter
import country_converter as coco # a country converter

#conda install -c anaconda nltk
import nltk # for NLP
#ltk.download('stopwords')
```

Data preperation

In [2]:
```
df = pd.read_csv("ks-projects-201801.csv")
df.head(5)
```

Out[2]:

	ID	name	category	main_category	currency	deadline	goal	launched
0	1000002330	The Songs of Adelaide & Abullah	Poetry	Publishing	GBP	2015-10-09	1000.0	2015-08-11 12:12:28
1	1000003930	Greeting From Earth: ZGAC Arts Capsule For ET	Narrative Film	Film & Video	USD	2017-11-01	30000.0	2017-09-02 04:43:57
2	1000004038	Where is Hank?	Narrative Film	Film & Video	USD	2013-02-26	45000.0	2013-01-12 00:20:50
3	1000007540	ToshiCapital Rekordz Needs Help to Complete Album	Music	Music	USD	2012-04-16	5000.0	2012-03-17 03:24:11
4	1000011046	Community Film Project: The Art of Neighborhoo...	Film & Video	Film & Video	USD	2015-08-29	19500.0	2015-07-04 08:35:03

In [89]:
```
df.columns #let's see which columns there are
```

Out[89]:
```
Index(['name', 'category', 'main_category', 'deadline', 'launched', 'state',
       'country', 'usd_pledged_real', 'usd_goal_real', 'duration',
       'country_GDP'],
      dtype='object')
```

Drop Unnecessary Columns

TODO: explain why we dropped this...

In [4]:
```
df = df.drop('backers', axis = 1) #TODO: explain
df = df.drop('usd pledged', axis = 1) #there is usd_pledged_real
df = df.drop('currency', axis = 1)    # TODO: explain
df = df.drop('goal', axis = 1)    # TODO: explain
df = df.drop('pledged', axis = 1)    # TODO: explain
df = df.drop('ID', axis = 1)    # TODO: explain
```

In [5]:

```
df.head(3)
```

Out[5]:

	name	category	main_category	deadline	launched	state	country	usd_pledged_real	usd
0	The Songs of Adelaide & Abullah	Poetry	Publishing	2015-10-09	2015-08-11 12:12:28	failed	GB	0.0	
1	Greeting From Earth: ZGAC Arts Capsule For ET	Narrative Film	Film & Video	2017-11-01	2017-09-02 04:43:57	failed	US	2421.0	
2	Where is Hank?	Narrative Film	Film & Video	2013-02-26	2013-01-12 00:20:50	failed	US	220.0	

Drop Unnecessary rows

TODO: explain...

In [6]:

```
# Drop live projects
df = df.query('state != "live"')

# Drop project with ' N,0" ' country
df = df.query("country != 'N,0\"' ")
```

TODO: change it... When examine the dataset, we paid attention that there are few rows that their launchdate was wrong.

In [7]:
```
df['deadline'] = pd.to_datetime(df['deadline'])
df['launched'] = pd.to_datetime(df['launched']).dt.normalize()

df[['name','deadline','launched']].nsmallest(10, 'launched')
```

Out[7]:

	name	deadline	launched
2842	Salt of the Earth: A Dead Sea Movie (Canceled)	2010-09-15	1970-01-01
48147	1st Super-Size Painting - Social Network Owned...	2010-08-14	1970-01-01
75397	"ICHOR" (Canceled)	2010-05-21	1970-01-01
94579	Support Solo Theater! Help "Ungrateful Daughte...	2010-06-01	1970-01-01
247913	Help RIZ Make A Charity Album: 8 Songs, 8 Caus...	2010-05-04	1970-01-01
273779	Identity Communications Infographic (Canceled)	2010-04-10	1970-01-01
319002	Student Auditions Music 2015	2015-10-31	1970-01-01
169268	Grace Jones Does Not Give A F$#% T-Shirt (limi...	2009-05-31	2009-04-21
322000	CRYSTAL ANTLERS UNTITLED MOVIE	2009-07-20	2009-04-23
138572	drawing for dollars	2009-05-03	2009-04-24

Let's remove them.

In [8]:
```
df = df.query('launched > "2008-01-01"')
```

Impute missing values

We want to see how many missing values we have - complete them, or ignore this rows. We found we have only 4 rows with missing values so we remove them.

In [9]:

```
# get the number of missing data points per column
missing_values_count = df.isnull().sum()
# look at the # of missing points in the first ten columns
print(missing_values_count[0:23])
# how many total missing values do we have?
total_cells = np.product(df.shape)
total_missing = missing_values_count.sum()
print(total_missing)
```

```
name                4
category            0
main_category       0
deadline            0
launched            0
state               0
country             0
usd_pledged_real    0
usd_goal_real       0
dtype: int64
4
```

In [10]:

```
# remove all columns with at least one missing value
df = df.dropna()
```

Insert New Columns

First, we want to add a 'Duration' column

In [11]:

```
df['duration'] = pd.to_datetime(df['deadline'], )-pd.to_datetime(df['launched'
]).dt.normalize()
```

Convert Columns #TODO: happened before...

In [12]:
```
df['deadline'] = pd.to_datetime(df['deadline'])
df['launched'] = pd.to_datetime(df['launched']).dt.normalize()
df.head(5)
```

Out[12]:

	name	category	main_category	deadline	launched	state	country	usd_pledged_r
0	The Songs of Adelaide & Abullah	Poetry	Publishing	2015-10-09	2015-08-11	failed	GB	
1	Greeting From Earth: ZGAC Arts Capsule For ET	Narrative Film	Film & Video	2017-11-01	2017-09-02	failed	US	242
2	Where is Hank?	Narrative Film	Film & Video	2013-02-26	2013-01-12	failed	US	22
3	ToshiCapital Rekordz Needs Help to Complete Album	Music	Music	2012-04-16	2012-03-17	failed	US	
4	Community Film Project: The Art of Neighborhoo...	Film & Video	Film & Video	2015-08-29	2015-07-04	canceled	US	128

Integrate with outsource DataSets

TODO: explain about the dataset TODO: fix the explantation We want to add a country's GDP column. The country name in Kickstarter's dataset and the GDP dataset are different - so we need no create a translation table.

countries_names_dict = {kickstarter_country : coco_country}

countries_GDP_dict = {GDP_country : GDP}

(*) Pay attention, GDP_country == coco_country

original_name_countries_GDP_dict = {kickstarter_country : GDP}

In [13]:

```python
countries_list = list(pd.unique(df.country))
#print(countries_list)

countries_names_dict = {}
i=0
for country in countries_list:
    l = [country]
    country_converted_name = coco.convert(names=l,to='name_short')
    countries_names_dict[country] = country_converted_name

print(countries_names_dict)

countries_GDP = pd.read_csv("ks_countries_gdp.csv")
countries_GDP_dict = pd.Series(countries_GDP['GDP ($ per capita)'].values,countries_GDP.Country).to_dict()

print()
#print(countries_GDP_dict)
#print()

original_name_countries_GDP_dict = {}
for country in countries_names_dict:
    #print(countries_names_dict[country])
    original_name_countries_GDP_dict[str(country)] = countries_GDP_dict[countries_names_dict[country] + ' ']
print(original_name_countries_GDP_dict)
```

```
{'GB': 'United Kingdom', 'US': 'United States', 'CA': 'Canada', 'AU': 'Austra
lia', 'NO': 'Norway', 'IT': 'Italy', 'DE': 'Germany', 'IE': 'Ireland', 'MX':
'Mexico', 'ES': 'Spain', 'SE': 'Sweden', 'FR': 'France', 'NL': 'Netherlands',
'NZ': 'New Zealand', 'CH': 'Switzerland', 'AT': 'Austria', 'DK': 'Denmark',
'BE': 'Belgium', 'HK': 'Hong Kong', 'LU': 'Luxembourg', 'SG': 'Singapore', 'J
P': 'Japan'}

{'GB': 27700.0, 'US': 37800.0, 'CA': 29800.0, 'AU': 29000.0, 'NO': 37800.0,
'IT': 26700.0, 'DE': 27600.0, 'IE': 29600.0, 'MX': 9000.0, 'ES': 22000.0, 'S
E': 26800.0, 'FR': 27600.0, 'NL': 28600.0, 'NZ': 21600.0, 'CH': 32700.0, 'A
T': 30000.0, 'DK': 31100.0, 'BE': 29100.0, 'HK': 28800.0, 'LU': 55100.0, 'S
G': 23700.0, 'JP': 28200.0}
```

Let's add the column.

In [14]:

```
df = df.assign(country_GDP = lambda x: x['country'])
df.replace({'country_GDP': original_name_countries_GDP_dict}, inplace=True)
df.head(5)
```

Out[14]:

	name	category	main_category	deadline	launched	state	country	usd_pledged_r
0	The Songs of Adelaide & Abullah	Poetry	Publishing	2015-10-09	2015-08-11	failed	GB	
1	Greeting From Earth: ZGAC Arts Capsule For ET	Narrative Film	Film & Video	2017-11-01	2017-09-02	failed	US	242
2	Where is Hank?	Narrative Film	Film & Video	2013-02-26	2013-01-12	failed	US	22
3	ToshiCapital Rekordz Needs Help to Complete Album	Music	Music	2012-04-16	2012-03-17	failed	US	
4	Community Film Project: The Art of Neighborhoo...	Film & Video	Film & Video	2015-08-29	2015-07-04	canceled	US	128

TODO: explain add the dataset...

Specifying Data Types

In [15]:

```
#binary_variables = ['class']
categorical_variables = ['category', 'main_category', 'state', 'country']
numeric_variables = ['usd_pledged_real','usd_goal_real']
date_time_variables = ['deadline','launched','duration']
```

Type Conversion

In [16]:

```
#TODO: Specifying Data Types, Type Conversion, Categorical and Binary Variable
s to String
```

In [17]:

```
df[categorical_variables].dtypes
```

Out[17]:

```
category         object
main_category    object
state            object
country          object
dtype: object
```

In [18]:

```
df[numeric_variables].dtypes
```

Out[18]:

```
usd_pledged_real    float64
usd_goal_real       float64
dtype: object
```

In [19]:

```
df[date_time_variables].dtypes
```

Out[19]:

```
deadline     datetime64[ns]
launched     datetime64[ns]
duration    timedelta64[ns]
dtype: object
```

Remove Whitespaces

In [20]:

```
# Map(func,sequence) -  operates a function on a sequence
# Lambda var1,var2.. : Expression -  Creates an inline function
for variable in categorical_variables:
    df[variable] = df[variable].map(lambda x : x.strip())
```

Binarize State label

In [21]:

```
df['state'] = df['state'].map(lambda x : '1' if x == 'successful' else '0')
```

Data Statistics

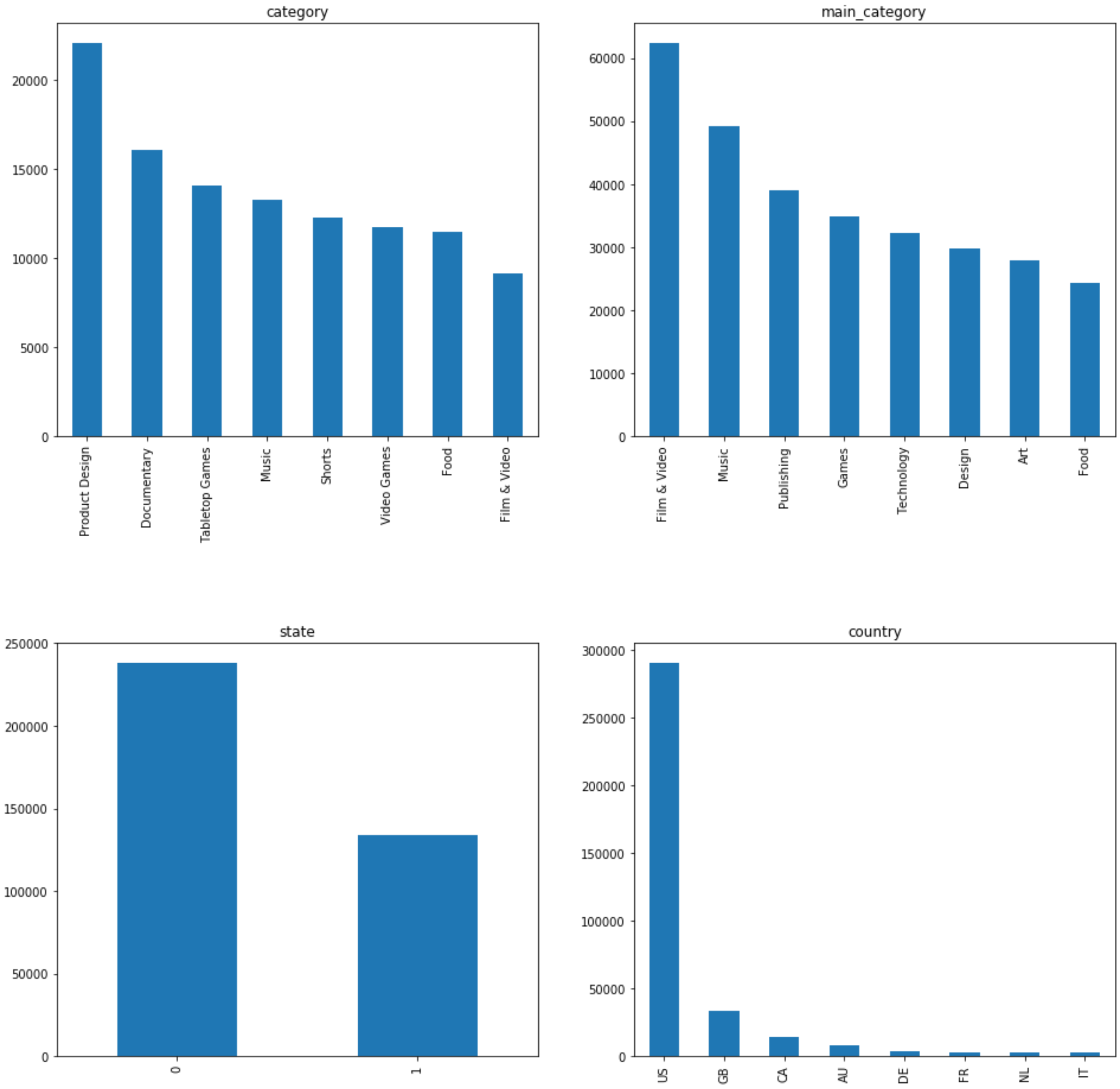
In [22]:

```
df.describe()

##TODO: need to remove the huge duration...
```

Out[22]:

	usd_pledged_real	usd_goal_real	duration	country_GDP
count	3.720550e+05	3.720550e+05	372055	372055.000000
mean	9.145509e+03	4.573831e+04	34 days 04:12:09.840480	35608.566475
std	9.162231e+04	1.151699e+06	12 days 19:02:33.006067	4445.312523
min	0.000000e+00	1.000000e-02	1 days 00:00:00	9000.000000
25%	3.125000e+01	2.000000e+03	30 days 00:00:00	37800.000000
50%	6.279700e+02	5.500000e+03	30 days 00:00:00	37800.000000
75%	4.066000e+03	1.600000e+04	37 days 00:00:00	37800.000000
max	2.033899e+07	1.663614e+08	92 days 00:00:00	55100.000000

```
In [23]: fig, axes = plt.subplots(2,2,figsize=(16,16))
         fig.subplots_adjust(hspace=0.5)
         i=0
         n=len(categorical_variables)
         for variable in categorical_variables:
             r=int(i/2)
             c=i%2
             i+=1
             u=min(len(df[variable].unique()),8)
             df[variable].value_counts()[:u].plot(kind='bar',ax=axes[r,c],title=variable)
```

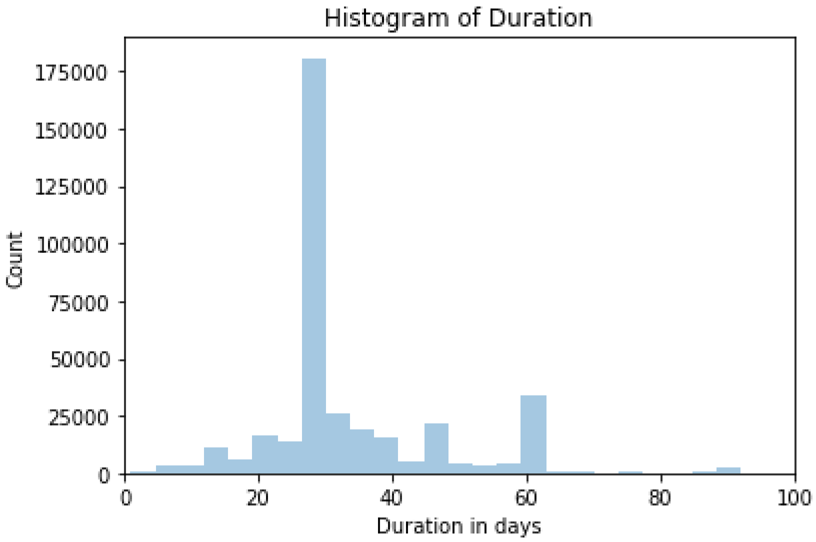


Class Distribution

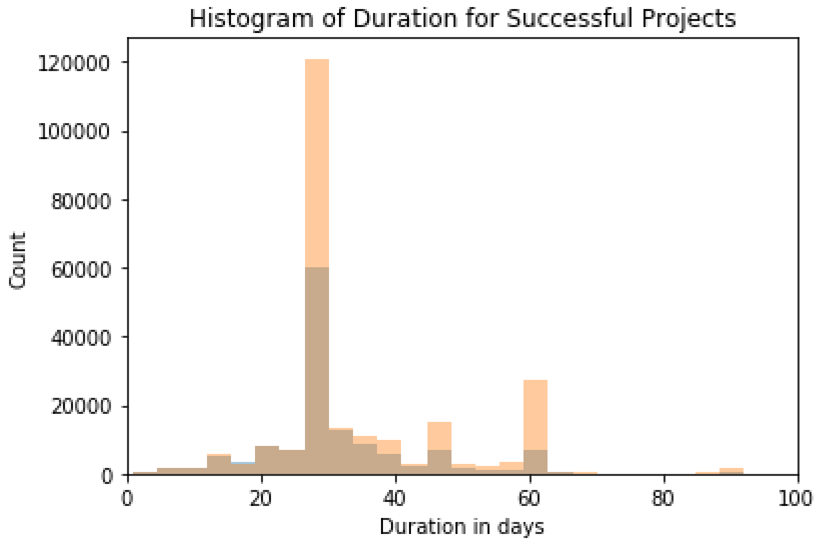
In [24]:
```
print (df['state'].value_counts())
print (df['state'].value_counts(normalize='True'))
```

```
0    238204
1    133851
Name: state, dtype: int64
0    0.640239
1    0.359761
Name: state, dtype: float64
```

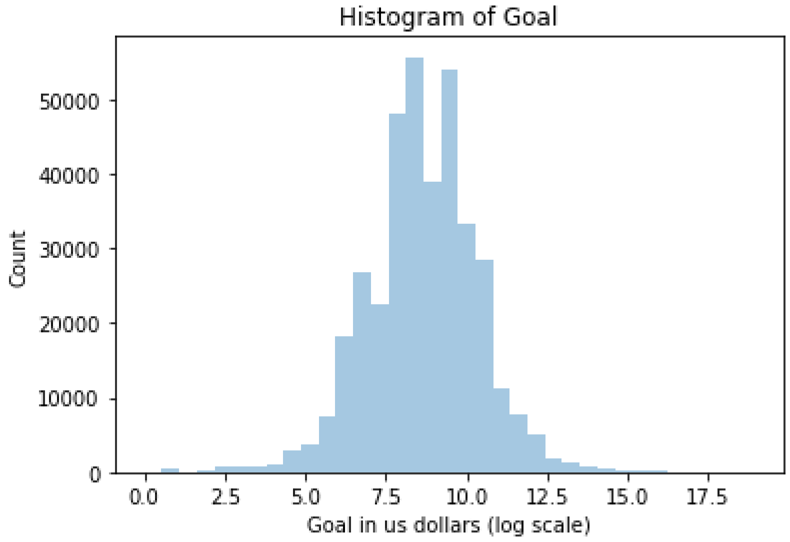
In [25]:
```
%matplotlib inline
sns.distplot(df['duration'].dt.days, bins = 25, kde = False).set(xlim=(0, 100
))
plt.title('Histogram of Duration')
plt.xlabel('Duration in days')
plt.ylabel('Count')
plt.show()
```



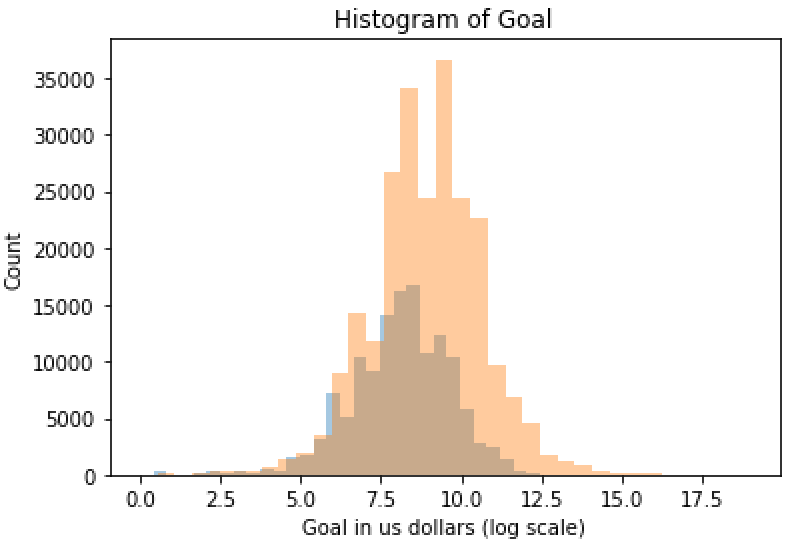
In [26]:
```
# can be removed...

sns.distplot(df.query('state != "0"')['duration'].dt.days,  bins = 25, kde = F
alse).set(xlim=(0, 100))
sns.distplot(df.query('state != "1"')['duration'].dt.days,  bins = 25, kde = F
alse).set(xlim=(0, 100))
plt.title('Histogram of Duration for Successful Projects')
plt.xlabel('Duration in days')
plt.ylabel('Count')
plt.show()
```



In [27]:
```
%matplotlib inline
sns.distplot(np.log1p(df['usd_goal_real']), bins = 35, kde = False)
plt.title('Histogram of Goal')
plt.xlabel('Goal in us dollars (log scale)')
plt.ylabel('Count')
plt.show()
```



```
In [28]: # TODO: make this histogram better

         sns.distplot(np.log1p(df.query('state != "0"')['usd_goal_real']), bins = 35, k
         de = False)
         sns.distplot(np.log1p(df.query('state != "1"')['usd_goal_real']), bins = 35, k
         de = False)
         plt.title('Histogram of Goal')
         plt.xlabel('Goal in us dollars (log scale)')
         plt.ylabel('Count')
         plt.show()
```



Analyzing 'name' column - DRAFT!!!

We want to analyze and check if the name of the project has influence on the success rate.

We noticed more then 20k rows contains '(Canceled)' in their name. Probably was changed by the owners after cancelling the project and opening a new one. TODO: explain...

```
In [29]: freq = pd.Series(' '.join(df['name']).split()).value_counts()[:10]
         freq
```

```
Out[29]: The              61774
         -                53415
         the              33698
         of               32988
         A                28526
         and              23428
         (Canceled)       23093
         a                20532
         for              19618
         &                17578
         dtype: int64
```

Let's remove this "clue".

In [30]:
```
df['name']= df['name'].str.replace("\(Canceled\)","")
freq = pd.Series(' '.join(df['name']).split()).value_counts()[:10]
freq
```

Out[30]:
```
The      61774
-        53415
the      33698
of       32988
A        28526
and      23428
a        20532
for      19618
&        17578
to       16640
dtype: int64
```

In [31]:
```
sub_df = df
sub_df = sub_df.drop('category', axis = 1)
sub_df = sub_df.drop('main_category', axis = 1)
sub_df = sub_df.drop('deadline', axis = 1)
sub_df = sub_df.drop('launched', axis = 1)
#sub_df = sub_df.drop('state', axis = 1)
sub_df = sub_df.drop('country_GDP', axis = 1)
sub_df = sub_df.drop('usd_pledged_real', axis = 1)
sub_df = sub_df.drop('usd_goal_real', axis = 1)
sub_df = sub_df.drop('duration', axis = 1)
sub_df = sub_df.drop('country', axis = 1)
```

In [32]:
```
sub_df.columns
```

Out[32]:
```
Index(['name', 'state'], dtype='object')
```

Let's examine name's char count:

In [33]:
```
sub_df['char_count'] = sub_df['name'].str.len() ## this also includes spaces
#sub_df[['name','char_count']].head()
```

Let's examine the number of words in the name:

In [34]:

```python
sub_df['word_count'] = sub_df['name'].apply(lambda x: len(str(x).split(" ")))
sub_df.head()
sub_df.nlargest(10, 'word_count')
```

Out[34]:

	name	state	char_count	word_count
209039	To Die For Mandy ...	0	60	41
272623	A SAFER USB C...	0	60	37
281301	WATCHMAKING PRO...	0	50	33
123932	Elk Hunting In The R...	0	60	32
221501	food truck ambrosia...	0	57	32
207925	Best at Sea "The Pilot"	0	47	29
375537	C A N D E L A B R U M | L i g h t . C h i l l ...	0	57	29
9993	Shelby and the Bread Factory ...	0	60	28
79595	Under the Western Sun - The Ret...	1	85	28
172359	The Joint - Get High On Our...	0	60	28

We want to extract the average word length of each 'Name'. So we simply take the sum of the length of all the words and divide it by the total length in the 'Name'.

In [35]:

```python
#pay attention - if rerun after There's a var called 'sum' - it might failed.

def avg_word(sentence):
    words = sentence.split()
    if (len(words)==0):
        return 0
    return (sum(len(word) for word in words))/len(words)

sub_df['avg_word'] = sub_df['name'].apply(lambda x: avg_word(x))
sub_df.head()
```

Out[35]:

	name	state	char_count	word_count	avg_word
0	The Songs of Adelaide & Abullah	0	31	6	4.333333
1	Greeting From Earth: ZGAC Arts Capsule For ET	0	45	8	4.750000
2	Where is Hank?	0	14	3	4.000000
3	ToshiCapital Rekordz Needs Help to Complete Album	0	49	7	6.142857
4	Community Film Project: The Art of Neighborhoo...	0	58	8	6.375000

We want to remove some stopwords #TODO: explain

In [36]:
```
from nltk.corpus import stopwords
stop = stopwords.words('english')
print (stop)
sub_df['stopwords'] = sub_df['name'].apply(lambda x: len([x for x in x.split()
if x in stop]))
sub_df[['name','stopwords']].head()
```

```
['i', 'me', 'my', 'myself', 'we', 'our', 'ours', 'ourselves', 'you', "you'r
e", "you've", "you'll", "you'd", 'your', 'yours', 'yourself', 'yourselves',
'he', 'him', 'his', 'himself', 'she', "she's", 'her', 'hers', 'herself', 'i
t', "it's", 'its', 'itself', 'they', 'them', 'their', 'theirs', 'themselves',
'what', 'which', 'who', 'whom', 'this', 'that', "that'll", 'these', 'those',
'am', 'is', 'are', 'was', 'were', 'be', 'been', 'being', 'have', 'has', 'ha
d', 'having', 'do', 'does', 'did', 'doing', 'a', 'an', 'the', 'and', 'but',
'if', 'or', 'because', 'as', 'until', 'while', 'of', 'at', 'by', 'for', 'wit
h', 'about', 'against', 'between', 'into', 'through', 'during', 'before', 'af
ter', 'above', 'below', 'to', 'from', 'up', 'down', 'in', 'out', 'on', 'off',
'over', 'under', 'again', 'further', 'then', 'once', 'here', 'there', 'when',
'where', 'why', 'how', 'all', 'any', 'both', 'each', 'few', 'more', 'most',
'other', 'some', 'such', 'no', 'nor', 'not', 'only', 'own', 'same', 'so', 'th
an', 'too', 'very', 's', 't', 'can', 'will', 'just', 'don', "don't", 'shoul
d', "should've", 'now', 'd', 'll', 'm', 'o', 're', 've', 'y', 'ain', 'aren',
"aren't", 'couldn', "couldn't", 'didn', "didn't", 'doesn', "doesn't", 'hadn',
"hadn't", 'hasn', "hasn't", 'haven', "haven't", 'isn', "isn't", 'ma', 'might
n', "mightn't", 'mustn', "mustn't", 'needn', "needn't", 'shan', "shan't", 'sh
ouldn', "shouldn't", 'wasn', "wasn't", 'weren', "weren't", 'won', "won't", 'w
ouldn', "wouldn't"]
```

Out[36]:

	name	stopwords
0	The Songs of Adelaide & Abullah	1
1	Greeting From Earth: ZGAC Arts Capsule For ET	0
2	Where is Hank?	1
3	ToshiCapital Rekordz Needs Help to Complete Album	1
4	Community Film Project: The Art of Neighborhoo...	1

In [37]:
```
sub_df.head()
```

Out[37]:

	name	state	char_count	word_count	avg_word	stopwords
0	The Songs of Adelaide & Abullah	0	31	6	4.333333	1
1	Greeting From Earth: ZGAC Arts Capsule For ET	0	45	8	4.750000	0
2	Where is Hank?	0	14	3	4.000000	1
3	ToshiCapital Rekordz Needs Help to Complete Album	0	49	7	6.142857	1
4	Community Film Project: The Art of Neighborhoo...	0	58	8	6.375000	1

PreProcessing

Lowercase

Move to lowercase #TODO: explain The first pre-processing step which we will do is transform our names into lower case. This avoids having multiple copies of the same words. For example, while calculating the word count, ‘Analytics’ and ‘analytics’ will be taken as different words.

In [38]:

```
sub_df['name'] = sub_df['name'].apply(lambda x: " ".join(x.lower() for x in x.
split()))
```

Removing Punctuation

Remove punctuation, as it doesn’t add any extra information while treating text data. Therefore removing all instances of it will help us reduce the size of the training data.

In [39]:

```
sub_df['name'] = sub_df['name'].str.replace('[^\w\s]','')
```

Removal of stopwords

stop words (or commonly occurring words) should be removed from the text data. For this purpose, we can use predefined libraries.

In [40]:

```
stop = stopwords.words('english')
sub_df['name'] = sub_df['name'].apply(lambda x: " ".join(x for x in x.split()
if x not in stop))
```

Stemming

TODO: change to linerize and not stemming

In [41]:

```
from nltk.stem import PorterStemmer

ps = PorterStemmer()
for name in sub_df['name']:
    name = ps.stem(name)
```

In [42]:

```
#current_df = df
#current_df = current_df.query('state != "0"')
#df = df.query('state != "live"')
success_freq = pd.Series(' '.join(sub_df.query('state != "0"')['name']).split
()).value_counts()
total_sum = 0
for frequency in success_freq:
    total_sum += frequency

print("Thera are total", success_freq.size, "different words.")
success_freq = success_freq[:100]
sum = 0
for frequency in success_freq:
    sum += frequency

print("Top 100 are", sum, "from total of", total_sum, "occurences, which are
{0:.2f}%".format(sum/total_sum*100))

#freq1 = success_freq
```

```
Thera are total 82127 different words.
Top 100 are 126462 from total of 606736 occurences, which are 20.84%
```

In [43]:

```
failed_freq = pd.Series(' '.join(sub_df.query('state != "1"')['name']).split
()).value_counts()
total_sum = 0
for frequency in failed_freq:
    total_sum += frequency

print("Thera are total", failed_freq.size, "different words.")
failed_freq = failed_freq[:100]
sum = 0
for frequency in failed_freq:
    sum += frequency

print("Top 100 are", sum, "from total of", total_sum, "occurences, which are
{0:.2f}%".format(sum/total_sum*100))

# TODO: fix the prints
#freq2 = failed_freq
```

```
Thera are total 122837 different words.
Top 100 are 176521 from total of 972646 occurences, which are 18.15%
```

In [44]:

```
mydiff = [suc for suc in success_freq.keys() if suc not in failed_freq.keys()]
print(mydiff)
```

```
['edition', 'dance', 'release', 'presents', 'recording', 'full', 'rpg', 'seas
on', 'issue', '3', 'fantasy', 'vinyl', 'theatre', 'musical', 'volume', '201
4', 'length', 'enamel', 'two', 'comedy', 'graphic', 'dice', '2013', 'horror',
'wallet', '2015', 'dark', '2012', 'last', 'watch', 'summer']
```

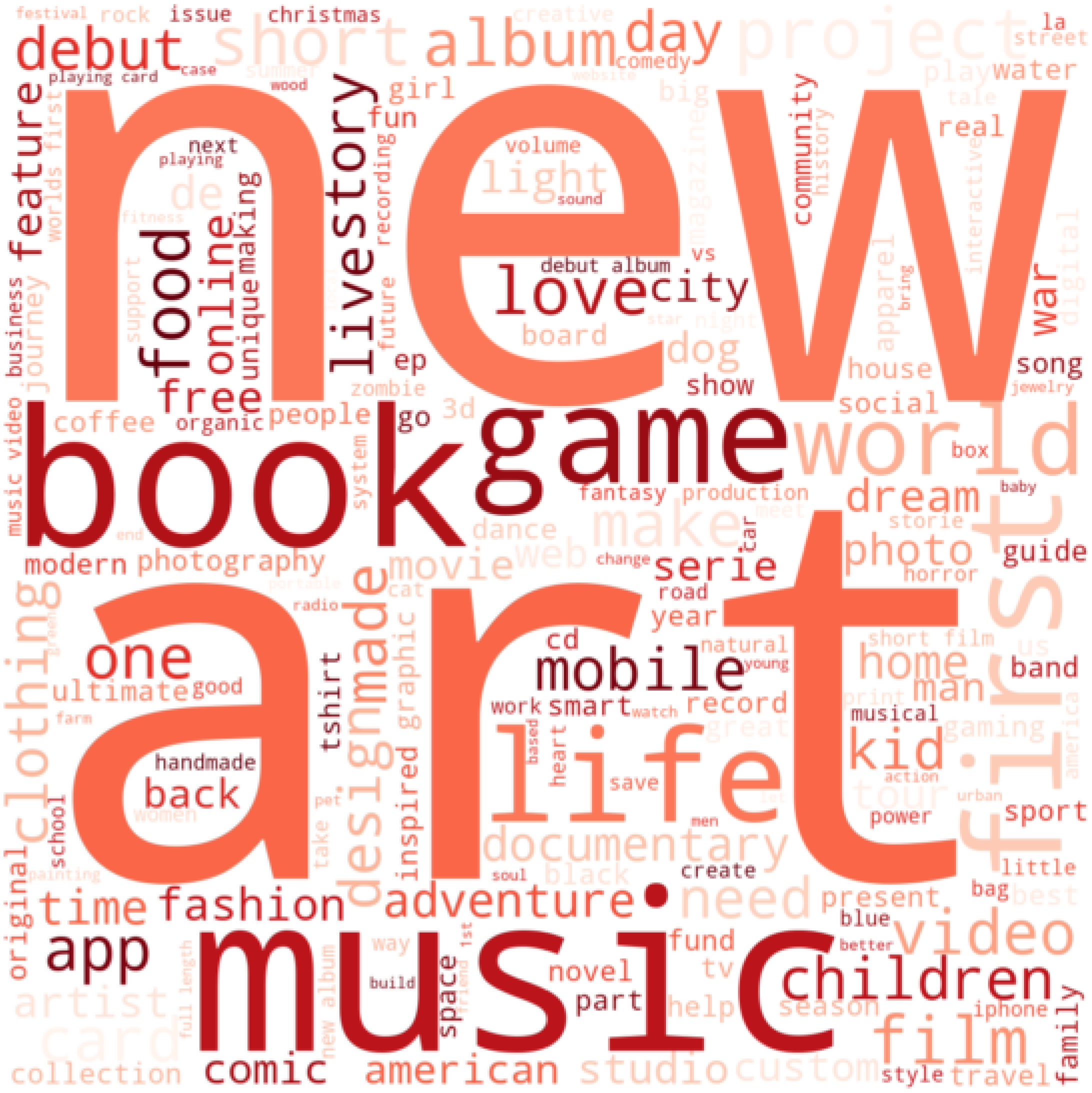
In [45]:

```
#conda install -c conda-forge wordcloud
from wordcloud import WordCloud, STOPWORDS, ImageColorGenerator
```

Most frequencied words in Failed Projects

TODO: change to bad colors

In [90]:
```
# Start with one review:
new_df = sub_df.query('state != "1"')
my_text = ' '
for name in new_df['name']:
    #print(name)
    my_text = my_text + name
    #text = sub_df['name'][0]

# Create and generate a word cloud image:
wordcloud = WordCloud(width = 1200, height = 1200,
                background_color ='white',
                min_font_size = 10, colormap="Reds").generate(my_text)

# Display the generated image:
plt.figure( figsize=(20,10) )
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis("off")
plt.show()
```

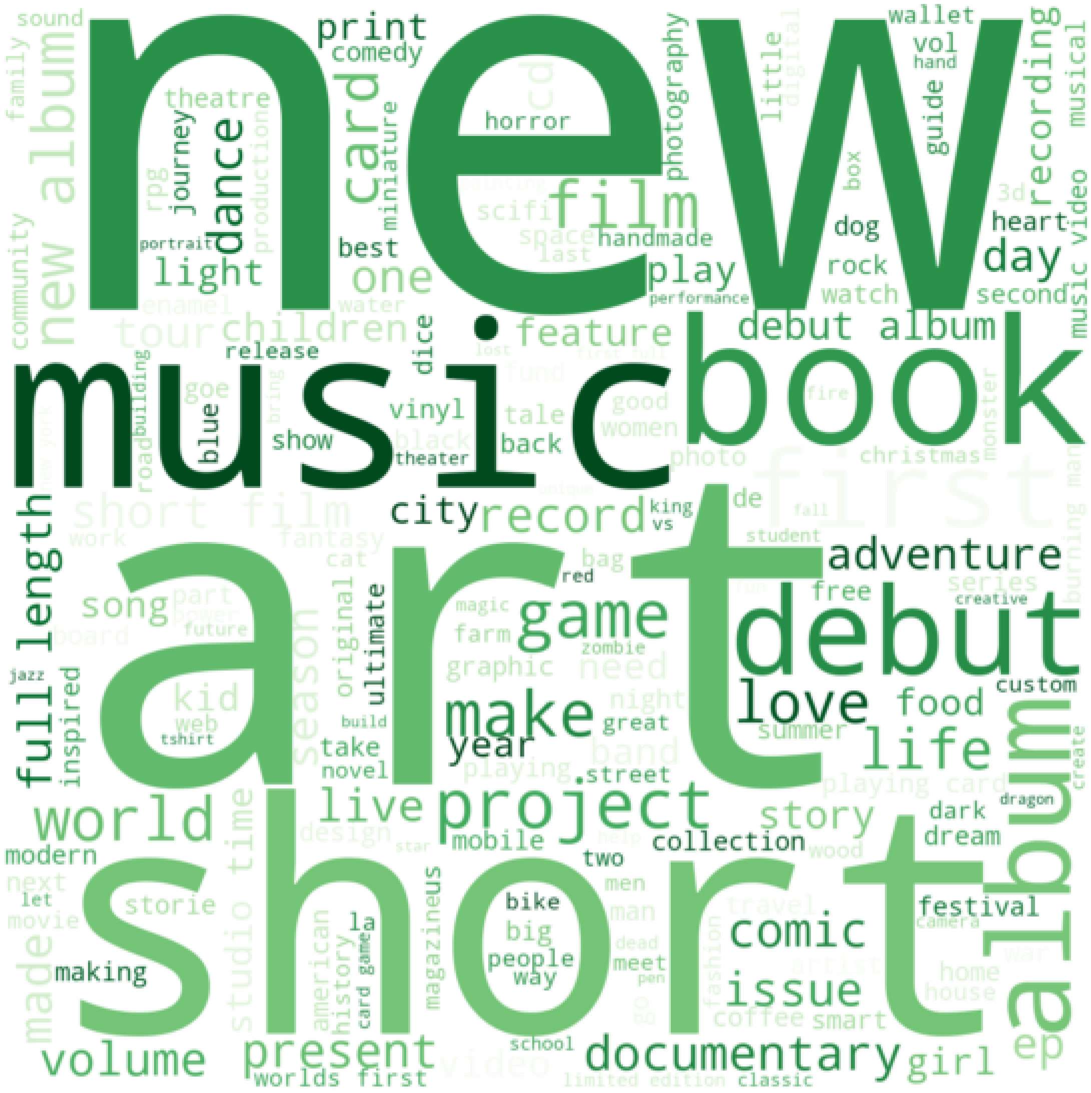


Most frequencied words in Succesful Projects

TODO: change to good colors

In [91]:

```python
# Start with one review:
new_df = sub_df.query('state != "0"')
my_text = ' '
for name in new_df['name']:
    #print(name)
    my_text = my_text + name
    #text = sub_df['name'][0]

# Create and generate a word cloud image:
wordcloud = WordCloud(width = 1200, height = 1200,
                background_color ='white',
                min_font_size = 10,colormap="Greens").generate(my_text)

# Display the generated image:
plt.figure( figsize=(20,10) )
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis("off")
plt.show()
```

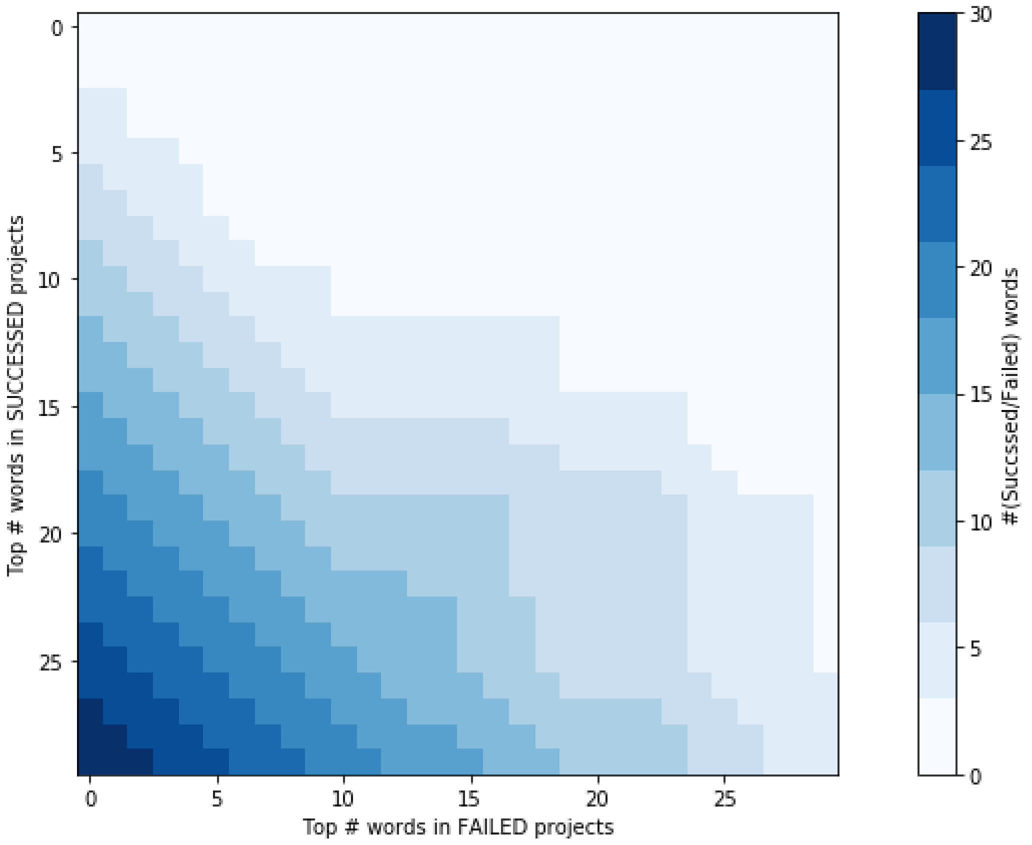


In [48]:

```
T = 30
diff_words = [[0] * T for i in range(T)]

for top_suc in range(T):
    for top_fail in range(T):
        val = len([suc for suc in success_freq[:top_suc].keys() if suc not in
failed_freq[:top_fail].keys()])
        diff_words[top_suc][top_fail] = val

diff_words2 = [[0] * T for i in range(T)]

for top_fail in range(T):
    for top_suc in range(T):
        val = len([fail for fail in failed_freq[:top_fail].keys() if fail not
in success_freq[:top_suc].keys()])
        diff_words2[top_suc][top_fail] = val
```

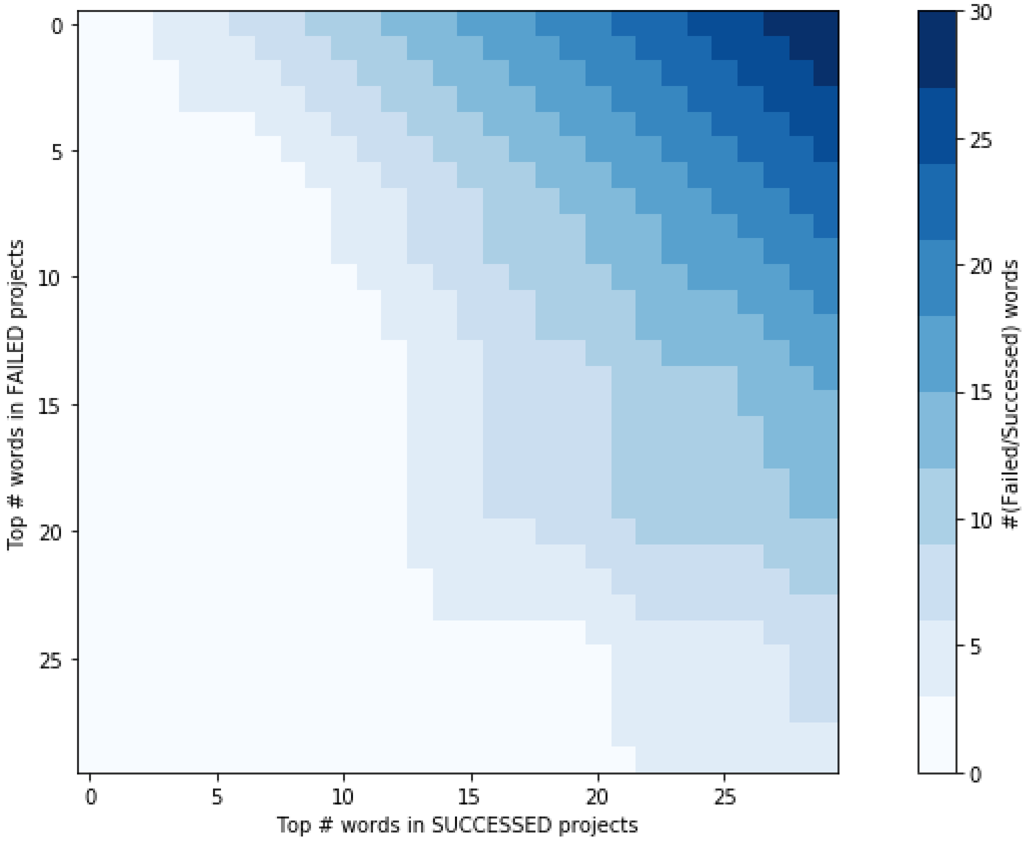
In [49]:

```
H = np.array(diff_words)
plt.figure( figsize=(14,7) )
plt.imshow(H, cmap=plt.cm.get_cmap('Blues', 10))
plt.xlabel("Top # words in FAILED projects")
plt.ylabel("Top # words in SUCCESSED projects")
plt.colorbar(label='#(Succssed/Failed) words')
plt.clim(0, T);
plt.show()
```



In [50]:

```
G = np.array(diff_words2)
plt.figure( figsize=(14,7) )
plt.imshow(G, cmap=plt.cm.get_cmap('Blues', 10))
plt.xlabel("Top # words in SUCCESSED projects")
plt.ylabel("Top # words in FAILED projects")
plt.colorbar(label='#(Failed/Successed) words')
plt.clim(0, T);
plt.show()
```



TODO: nice graph of difference words between Success and Failed

create two vars graph with colors

1) Top # success words

2) Top # failed words

3) color = diff

maybe precent from total words... acctually need two graphs

TODO: analyze #chars, avg_words, #words

Let's examine the most successful words and most failed words

In [51]:

```
S = 50
F = 100
print("In the TOP-50 but not in the TOP-100:")
successed_words_list = [suc for suc in success_freq[:S].keys() if suc not in failed_freq[:F].keys()]
print("success words:",successed_words_list)

S = 70
F = 100
failed_words_list = [fail for fail in failed_freq[:S].keys() if fail not in success_freq[:F].keys()]
print("faild words:",failed_words_list)
```

```
In the TOP-50 but not in the TOP-100:
success words: ['edition', 'dance', 'release', 'presents', 'recording', 'ful
l']
faild words: ['app', 'clothing', 'mobile', 'fashion', 'dream', 'design', 'app
arel', 'suspended', 'journey', 'photography', 'system', 'way', 'online', 'soc
ial']
```

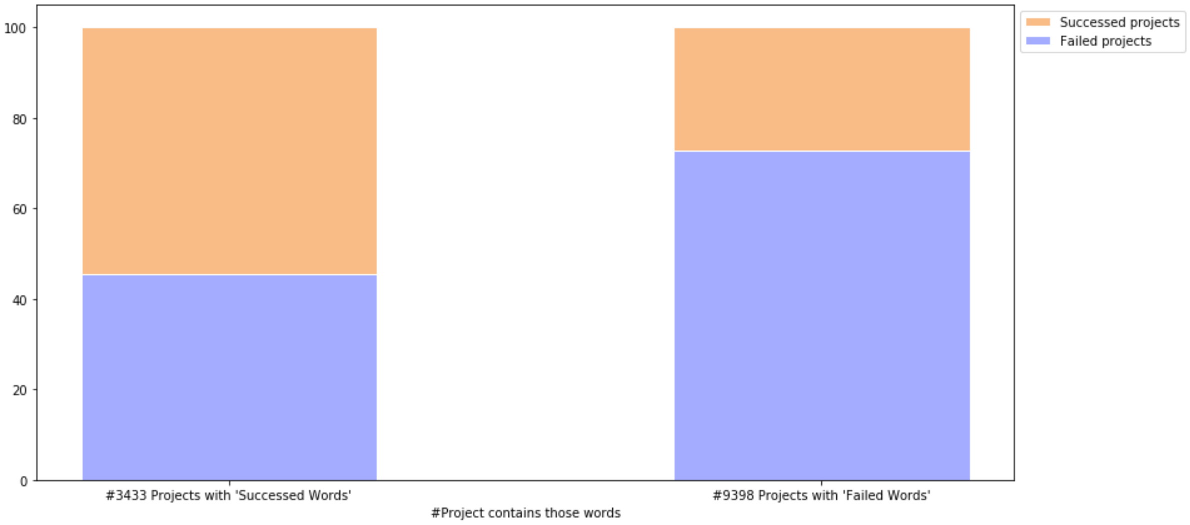
In [52]:

```
#str_to_search = 'app|clothing|mobile|fashion|dream'
#str_to_search = 'edition|dance|release|presents|recording|full'
success_words_to_search = '|'.join(successed_words_list)
failed_words_to_search = '|'.join(failed_words_list)


originaldf = df[['name','state']]
fdf = originaldf.query('state != "1"')
sdf = originaldf.query('state != "0"')
booldf = sdf['name'].str.contains(success_words_to_search)
success_project_by_success_words = np.sum(booldf)
booldf = fdf['name'].str.contains(success_words_to_search)
failed_project_by_success_words = np.sum(booldf)
print(success_project_by_success_words)
print(failed_project_by_success_words)

booldf = sdf['name'].str.contains(failed_words_to_search)
success_project_by_failed_words = np.sum(booldf)
booldf = fdf['name'].str.contains(failed_words_to_search)
failed_project_by_failed_words = np.sum(booldf)
print(success_project_by_failed_words)
print(failed_project_by_failed_words)
```

```
1869
1564
2556
6842
```

In [53]:

```
# Data
r = [0,1]
raw_data = {'orangeBars': [success_project_by_success_words, success_project_by_failed_words],
            'blueBars': [failed_project_by_success_words, failed_project_by_failed_words]}
plot_df = pd.DataFrame(raw_data)

# From raw value to percentage
totals = [i+j for i,j in zip(plot_df['orangeBars'], plot_df['blueBars'])]
orangeBars = [i / j * 100 for i,j in zip(plot_df['orangeBars'], totals)]
blueBars = [i / j * 100 for i,j in zip(plot_df['blueBars'], totals)]

# plot
barWidth = 0.5
A = "#" + str(success_project_by_success_words + failed_project_by_success_words) + " Projects with 'Successed Words'"
B = "#" + str(success_project_by_failed_words + failed_project_by_failed_words) + " Projects with 'Failed Words'"
names = (A,B)

# Create orange Bars
label1 = "Successed projects"
plt.figure( figsize=(14,7) )
plt.bar(r, orangeBars, bottom=blueBars, color='#f9bc86', edgecolor='white', width=barWidth, label=label1)
# Create blue Bars
label2 = "Failed projects"
plt.bar(r, blueBars, color='#a3acff', edgecolor='white', width=barWidth, label=label2)

# Custom x axis
plt.xticks(r, names)
plt.xlabel("#Project contains those words")

# Add a Legend
plt.legend(loc='upper left', bbox_to_anchor=(1,1), ncol=1)

# Show graphic
plt.show()
```



Let's add this columns in our dataset

In [54]:
```
sub_df = sub_df.assign(contains_successed_words = lambda x: x['name'].str.cont
ains(success_words_to_search))
sub_df = sub_df.assign(contains_failed_words = lambda x: x['name'].str.contain
s(failed_words_to_search))
sub_df.head(10)
```

Out[54]:

	name	state	char_count	word_count	avg_word	stopwords	contains_successed_word
0	songs adelaide abullah	0	31	6	4.333333	1	Fals
1	greeting earth zgac arts capsule et	0	45	8	4.750000	0	Fals
2	hank	0	14	3	4.000000	1	Fals
3	toshicapital rekordz needs help complete album	0	49	7	6.142857	1	Fals
4	community film project art neighborhood filmma...	0	58	8	6.375000	1	Fals
5	monarch espresso bar	1	20	3	6.000000	0	Fals
6	support solar roasted coffee green energy sola...	1	60	9	6.500000	0	Fals
7	chaser strips strips make shots btch	0	49	8	5.250000	1	Fals
8	spin premium retractable inear headphones mic	0	53	8	5.750000	1	Fals
9	studio sky documentary feature film	0	47	10	4.222222	0	Fals

was taken from another one...

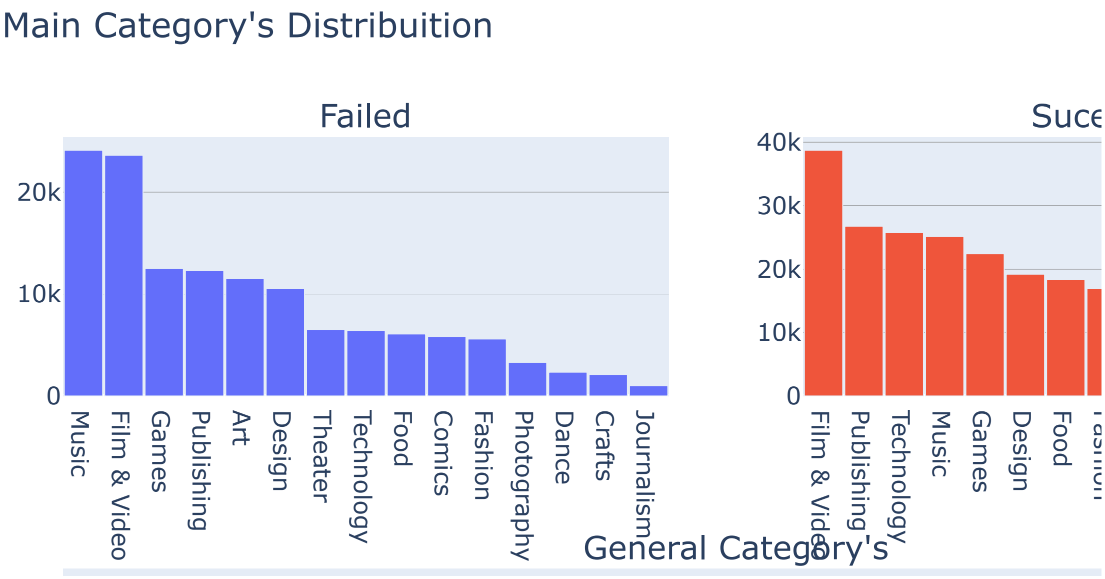
https://www.kaggle.com/kosovanolexandr/kickstarter-lgbmclassifier-0-681 (https://www.kaggle.com/kosovanolexandr/kickstarter-lgbmclassifier-0-681)

In [55]:

```
main_cats = df["main_category"].value_counts()
main_cats_failed = df[df["state"] == "1"]["main_category"].value_counts()
main_cats_sucess = df[df["state"] == "0"]["main_category"].value_counts()
```

In [59]:

```
import plotly.tools as tls
import plotly.offline as py
from plotly.offline import init_notebook_mode, iplot, plot
import plotly.graph_objs as go
init_notebook_mode(connected=True)
import warnings
from collections import Counter

#First plot
trace0 = go.Bar(
    x=main_cats_failed.index,
    y=main_cats_failed.values,
    name="Failed Category's"
)
#Second plot
trace1 = go.Bar(
    x=main_cats_sucess.index,
    y=main_cats_sucess.values,
    name="Sucess Category's"
)
#Third plot
trace2 = go.Bar(
    x=main_cats.index,
    y=main_cats.values,
    name="All Category's Distribuition"
)

#Creating the grid
fig = tls.make_subplots(rows=2, cols=2, specs=[[{}, {}], [{'colspan': 2}, None
]],
                          subplot_titles=('Failed','Sucessful', "General Categ
ory's"))

#setting the figs
fig.append_trace(trace0, 1, 1)
fig.append_trace(trace1, 1, 2)
fig.append_trace(trace2, 2, 1)

fig['layout'].update(showlegend=True, title="Main Category's Distribuition",ba
rgap=0.05)
iplot(fig)
```

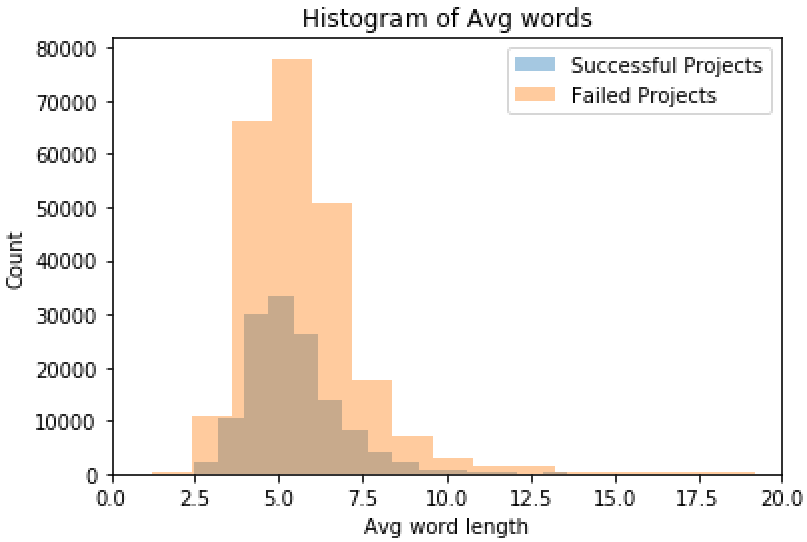


good one:

https://www.kaggle.com/kromel/kickstarter-successful-vs-failed (https://www.kaggle.com/kromel/kickstarter-successful-vs-failed)

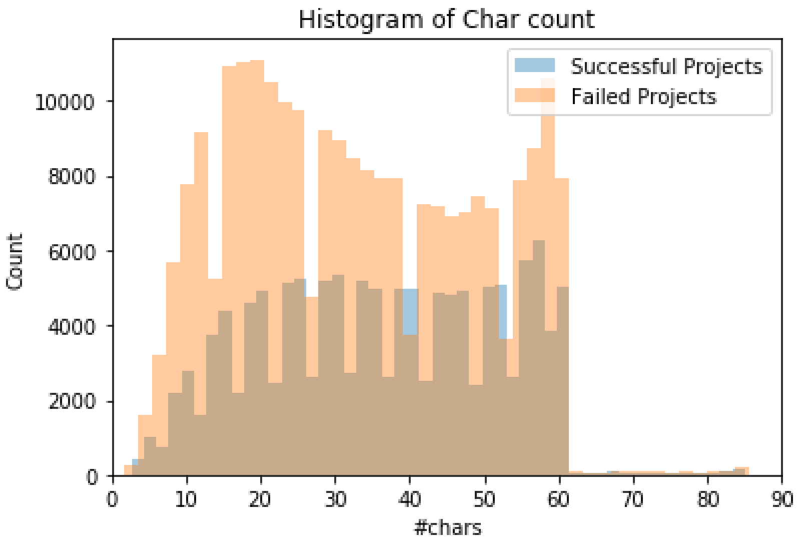
In [67]:

```
sns.distplot(sub_df.query('state != "0"')['avg_word'],  bins = 50, kde = False
, label="Successful Projects").set(xlim=(0, 20))
sns.distplot(sub_df.query('state != "1"')['avg_word'],  bins = 50, kde = False
, label="Failed Projects").set(xlim=(0, 20))
plt.title('Histogram of Avg words')
plt.legend(loc='upper right')
plt.xlabel('Avg word length')
plt.ylabel('Count')
plt.show()
```

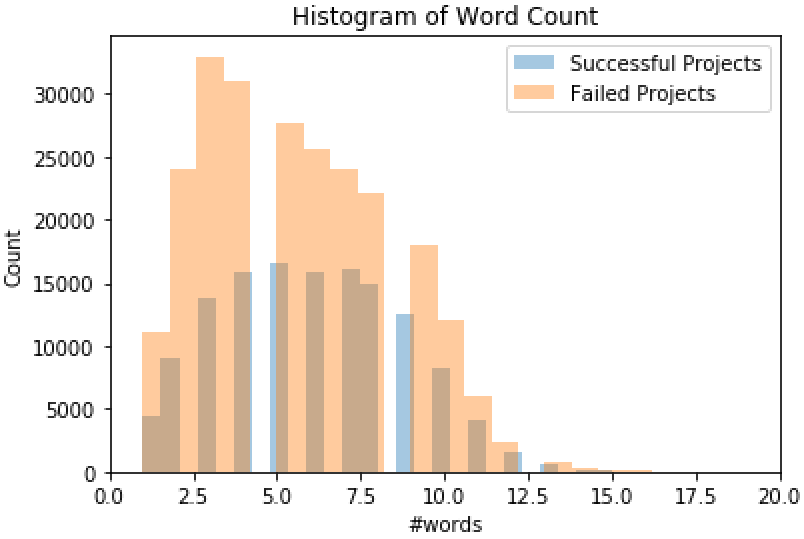


In [71]:

```
sns.distplot(sub_df.query('state != "0"')['char_count'],  bins = 50, kde = Fal
se, label="Successful Projects").set(xlim=(0, 90))
sns.distplot(sub_df.query('state != "1"')['char_count'],  bins = 50, kde = Fal
se, label="Failed Projects").set(xlim=(0, 90))
plt.title('Histogram of Char count')
plt.legend(loc='upper right')
plt.xlabel('#chars')
plt.ylabel('Count')
plt.show()
```

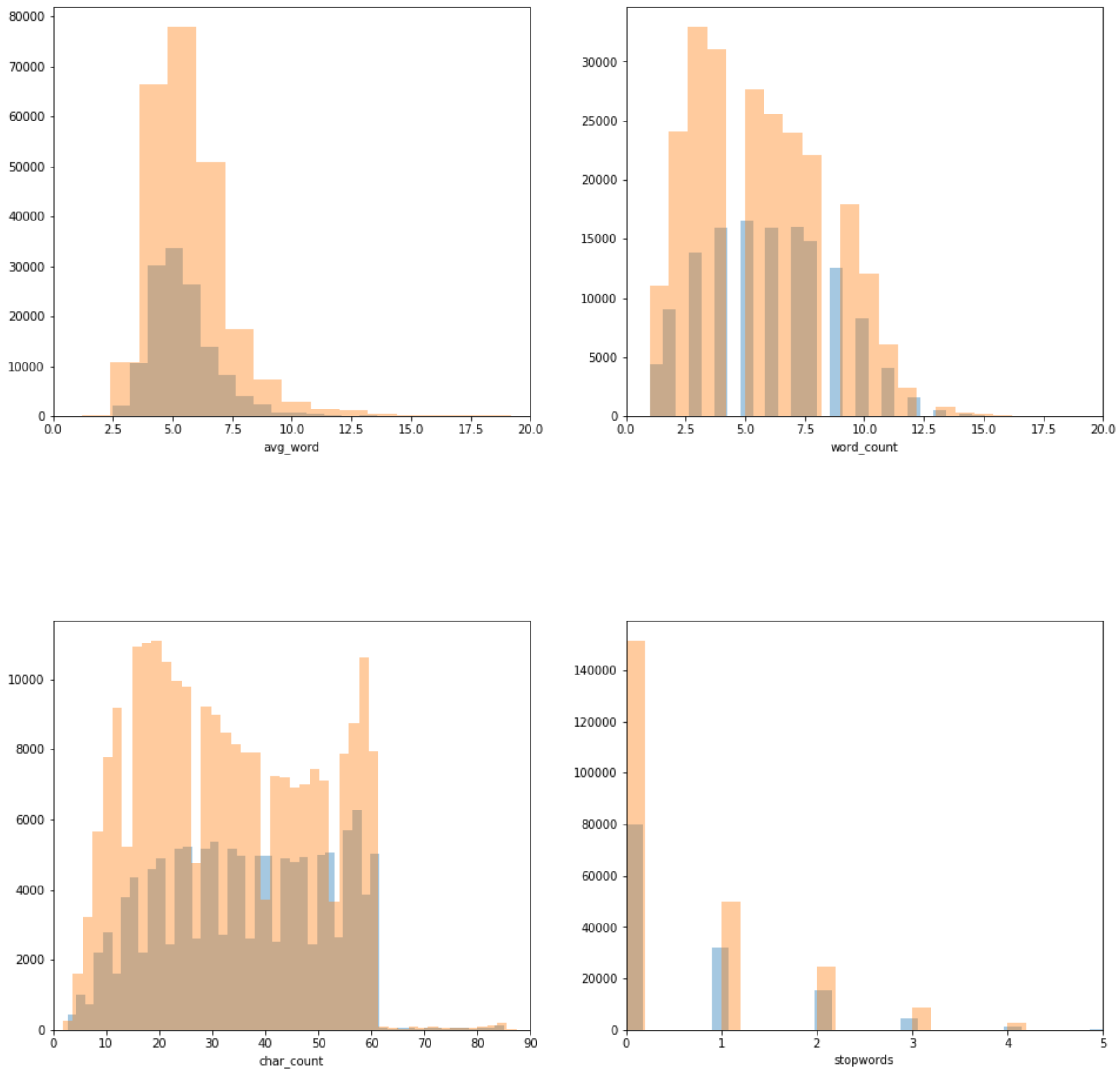


In [74]:
```
sns.distplot(sub_df.query('state != "0"')['word_count'],  bins = 50, kde = False, label="Successful Projects").set(xlim=(0, 20))
sns.distplot(sub_df.query('state != "1"')['word_count'],  bins = 50, kde = False, label="Failed Projects").set(xlim=(0, 20))
plt.title('Histogram of Word Count')
plt.legend(loc='upper right')
plt.xlabel('#words')
plt.ylabel('Count')
plt.show()
```



In [88]:

```
fig, axes = plt.subplots(2,2,figsize=(16,16))
fig.subplots_adjust(hspace=0.5)
i=0
n=4
nlp_vars = ["avg_word","word_count","char_count","stopwords"]
max_x = {"avg_word":20, "word_count":20, "char_count":90, "stopwords":5}
for variable in nlp_vars:
    r=int(i/2)
    c=i%2
    i+=1
    sns.distplot(sub_df.query('state != "0"')[variable],  bins = 50, kde = False,ax=axes[r,c], label="Successful Projects").set(xlim=(0, max_x[variable]))
    sns.distplot(sub_df.query('state != "1"')[variable],  bins = 50, kde = False,ax=axes[r,c], label="Failed Projects").set(xlim=(0, max_x[variable]))
```



In [ ]: