The Oldest Profession Is Not What You Think

Contrary to what you have been told, the oldest profession is actually Journalist:

"a person who writes for newspapers, magazines, or news websites or prepares news to be broadcast."

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Contrary to what you've heard, **journalist** is the oldest profession in the world, because “In the beginning”, someone had to have been there when Eve and Adam ate the apple from the forbidden tree! Otherwise how could we ever know where humanity began?

However the reality as we know it, started to change...

```
import pandas as pd
import json
import re
import warnings
warnings.filterwarnings('ignore')

import numpy as np
import matplotlib.pyplot
%matplotlib inline

import seaborn as sns
```

The data was aquired and saved to a file using a separated python script (find on attachment).

```
with open('wiki-data-v2.json') as f:
    content = f.readlines()
```

```
def get_json(string):
    string = string.replace(',\n', '')
    return json.loads(string)
```

```
df = pd.DataFrame.from_records(map(get_json, content))
```

The story that follows is told around a chunk of data from Wikipedia (precisely Wikipedia metadata). The fun came up by noticing the top user names per amount of actions performed on Wikipedia!

```
df.groupby('user')['action'].count() \
                            .reset_index(name='count') \
                            .sort_values(['count'], ascending=False) \
                            .head(10)
```

	user	count
370	HostBot	199
384	InternetArchiveBot	129
228	BD2412	98
226	AvalerionV	60
385	Iridescent	52
662	William Avery	49
542	Onel5969	49
382	InceptionBot	38
278	Corkythehornetfan	26
251	CAPTAIN RAJU	21

Fact: some of the usernames end up in "...Bot"

Hum, ok there is a variable that identifies the Bots ("is_bot") but is it trustful? Lets check ourselves if it capture all the obviouse Bot usernames!

```
bot_df = df[['user', 'action', 'is_bot', 'change_size', 'ns']]
regex = r'.*[bB][oO][tT]'
bot_df['my_is_bot'] = df.user.str.match(regex)
bot_df.head(5)
```

	user	action	is_bot	change_size	ns	my_is_bot
0	Terriffic Dunker Guy	edit	False	99.0	Main	False
1	VICTOR ERNESTO RODRIGUEZ	create	False	NaN	Special	False
10	M2545	edit	False	445.0	Main	False
100	66.7.227.226	edit	False	-1.0	Main	False
1000	Hyacinth	edit	False	203.0	Category	False

```
isbot = pd.DataFrame(bot_df.is_bot.value_counts().reset_index())
myisbot = pd.DataFrame(bot_df.my_is_bot.value_counts().reset_index())
check_bots = pd.merge(isbot,myisbot)
check_bots.set_index(check_bots['index']).drop('index', axis = 1)

check_bots
```

	index	is_bot	my_is_bot
0	False	1972	1759
1	True	222	435

Looks like it doesn't! Not all the bot usernames are identified through the "is_bot" variable and perhaps there are other bots non explicit by the username!

But why not filter only by the my_is_bot variable? Since we know it capture 435 bot actions?

(Lets create a new dataframe with all possible bots accounts)

```
bots = bot_df.query('is_bot == True or my_is_bot == True')
bots.user.count()
```

```
436
```

One row has a username that is not crystal clear!

```
bots.query("is_bot == True and my_is_bot == False")
```

	user	action	is_bot	change_size	ns	my_is_bot
645	Ops Monitor (WMF)	edit	True	-9.0	User	False

That's why it is important to never discard data, some important information is in the details!

Lets label this dataset as actions performed by humans or bots

```
# Just to be faster than an df.apply(...)
bot_df['user_or_bot'] = 'human'
bot_df.loc[(bot_df['is_bot'] == True) | (bot_df['my_is_bot'] == True),
'user_or_bot'] = 'bot'
bot_df.user_or_bot.value_counts()
```

```
human    1758
bot       436
Name: user_or_bot, dtype: int64
```

24.8% of the actions were performed by a machines!

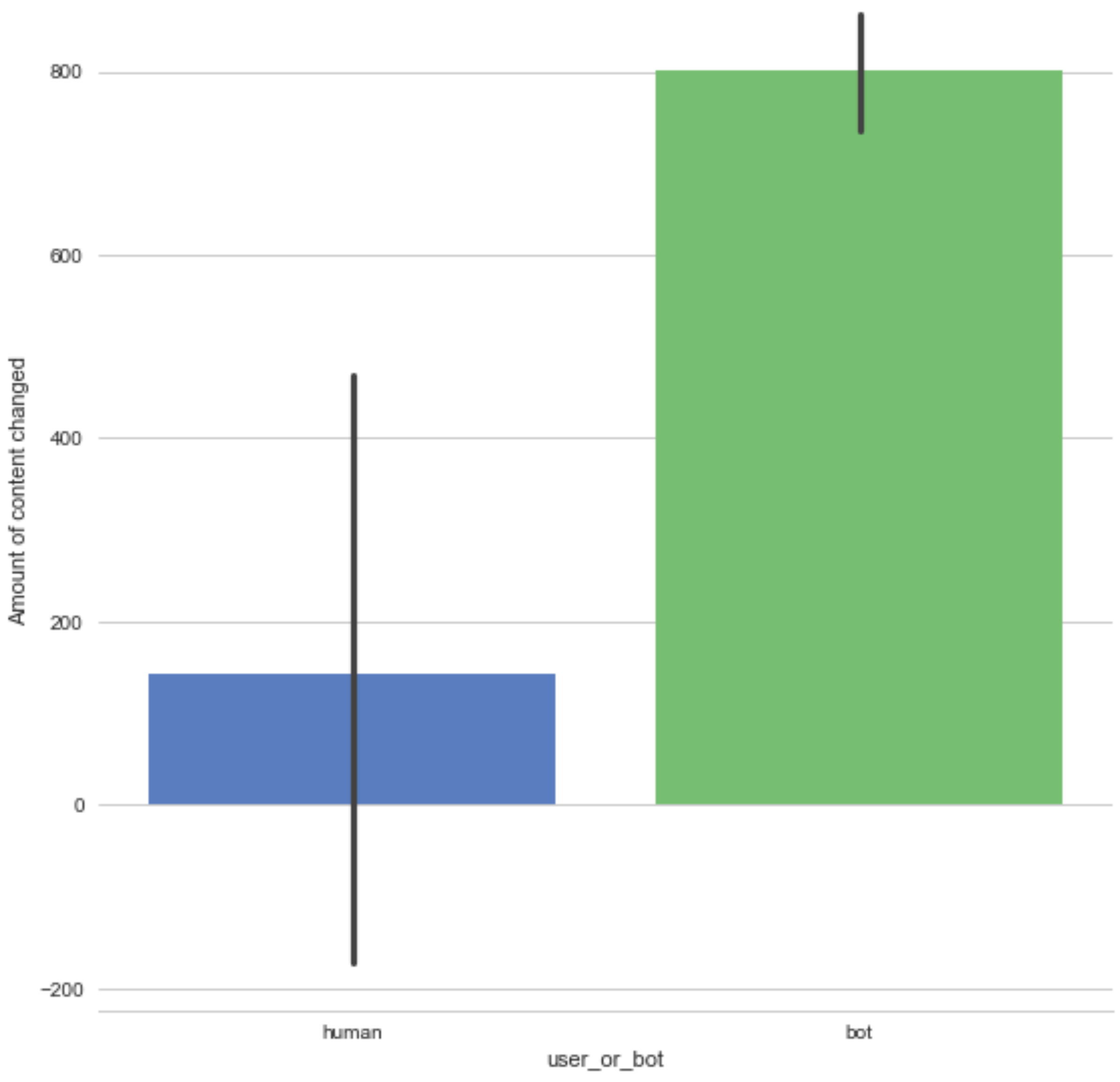
What kind of 'Actions' the bots usually perform?

```
unique_action = bot_df.query("user_or_bot == 'bot'").action.unique()

# Just for the sake of printing the list which shows that
# there is only one action, I am using the print as a
# function (from future), which is a "limitation" of python 2.7
from __future__ import print_function
map(lambda x: print(x), unique_action)
```

```
edit
```

Let's visualise the impact in terms of content changed by humans or bots, in Wikipedia!

```
sns.set(style="whitegrid")

g = sns.factorplot(x="user_or_bot", y="change_size", data=bot_df,
                   size=8, kind="bar", palette="muted")

g.despine(left=True)
g.set_ylabels("Amount of content changed")
```



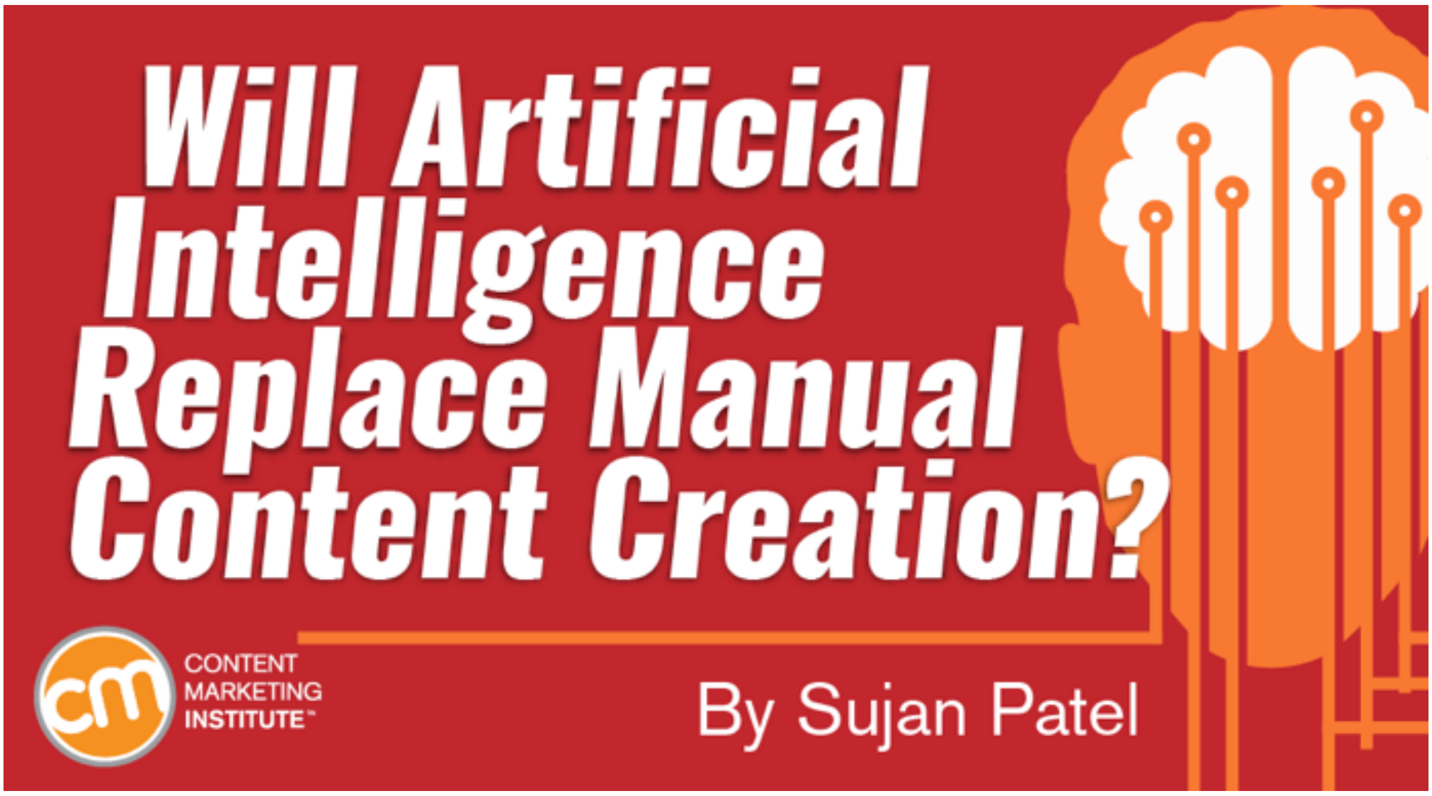
Let's pick up from our story

Wikipedia is the largest and most popular general reference work on the Internet (launched at 2001)

Nowadays the content generated or removed from it, is mainly managed and generated by AI, in this case bots!

Indeed the reality changed, while in the older days content was generated by journalists.

```
from IPython.display import Image
Image(filename='image2.png')

# Image source:
# http://contentmarketinginstitute.com/2017/03/
artificial-intelligence-manual-creation/
# (Good opinion article for further reading)
```


Will Artificial Intelligence Replace Manual Content Creation?
CONTENT MARKETING INSTITUTE
By Sujan Patel

Certainly a question that I cannot answer, but maybe the dataset can give us an hint!?

```
bot_df['action_count'] = 1
```

Selecting only the entries where the action is "edit" because:

- other actions have NaN values
- not bias the analyse since the bots are just present on "edit" actions

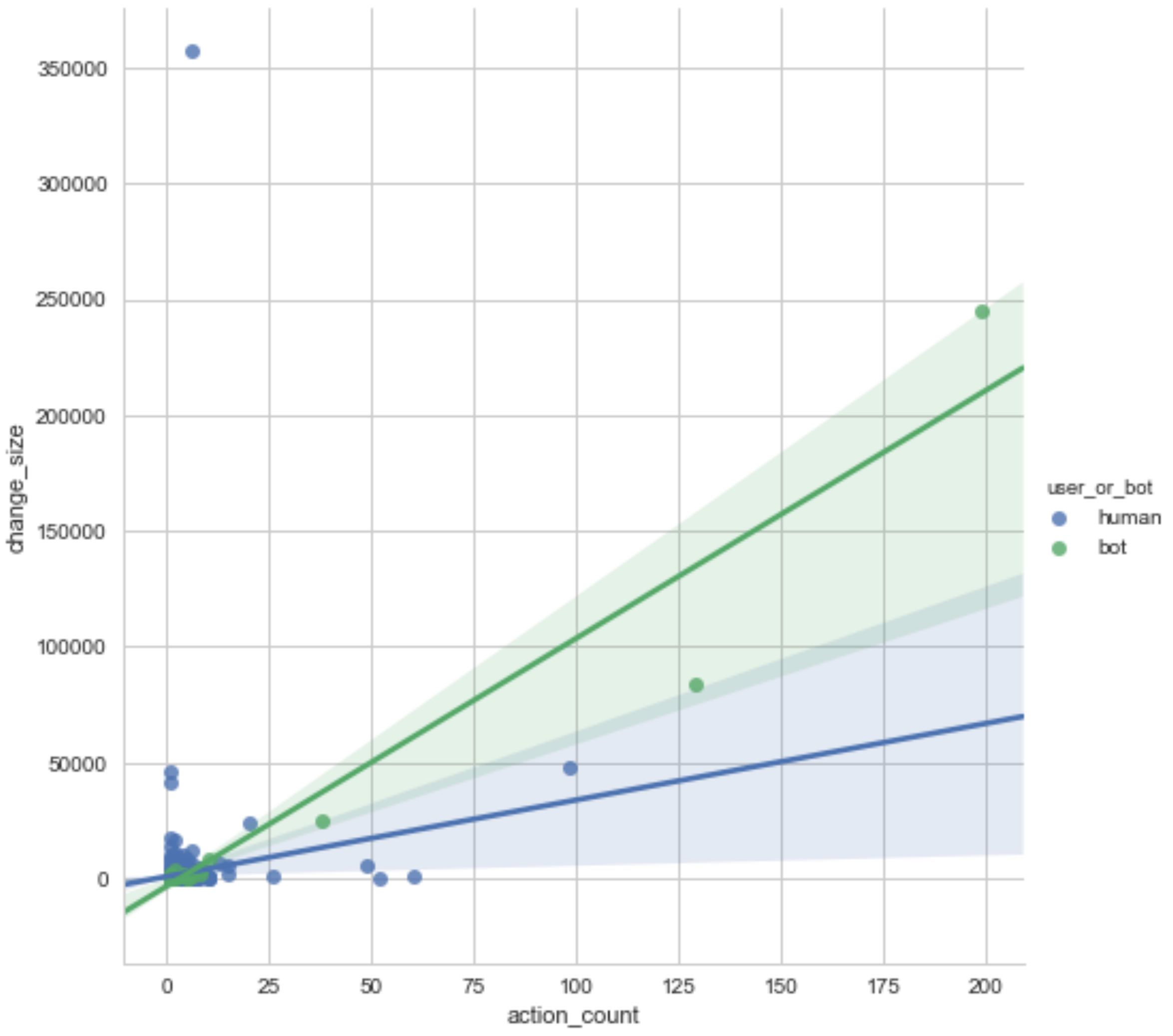
```
bot_df['change_size'] = bot_df['change_size'].abs()
grouped_df = bot_df.query('action == "edit"') \
                  .groupby('user')[['change_size',
                  'action_count',
                  'user_or_bot']].sum()
grouped_df.reset_index(level=0, inplace=True)

joined_df = grouped_df.merge(bot_df[['user', 'user_or_bot']],
                              on='user', how='left') \
                     .drop_duplicates()
```

```
joined_df.user_or_bot.value_counts()
```

```
human    618
bot       25
Name: user_or_bot, dtype: int64
```

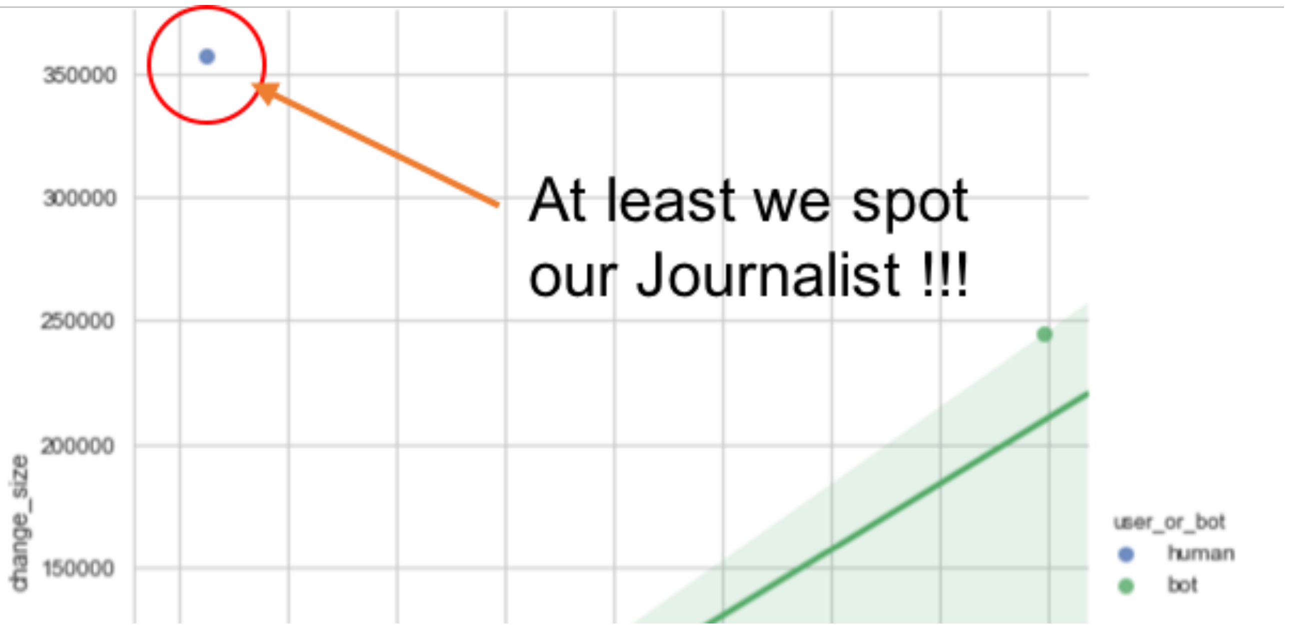
Only 25 different Bots are presented in this dataset

```
g2 = sns.lmplot(y="change_size", x="action_count", hue="user_or_bot",
data=joined_df, size=7)
```



To conclude, it is a fact that Wikipedia, the largest center of information, is actually mainly managed by Bots.

```
Image(filename='journalist1.png')
```



(**note**: we found an outlier which has the human charactericte and and unlikely amount of "change_size", following the initial story we can say he is a "journalist"!)

Attachment #1

Code used to receive JSONs from wikimon websocket into a file.

```
import time
from websocket import create_connection
import json

def get_time():
    return time.asctime(time.localtime(time.time())).split(' ')[3]

ws = create_connection("ws://wikimon.hatnote.com:9000")

f = open('wiki-data-v2.json', 'w')

t_end = time.time() + 10 * 90

while time.time() < t_end:
    result =  ws.recv()
    result = json.loads(result)
    result[u'timestamp'] = get_time()
    json.dump(result, f)
    f.write(',\n')

f.close()
```