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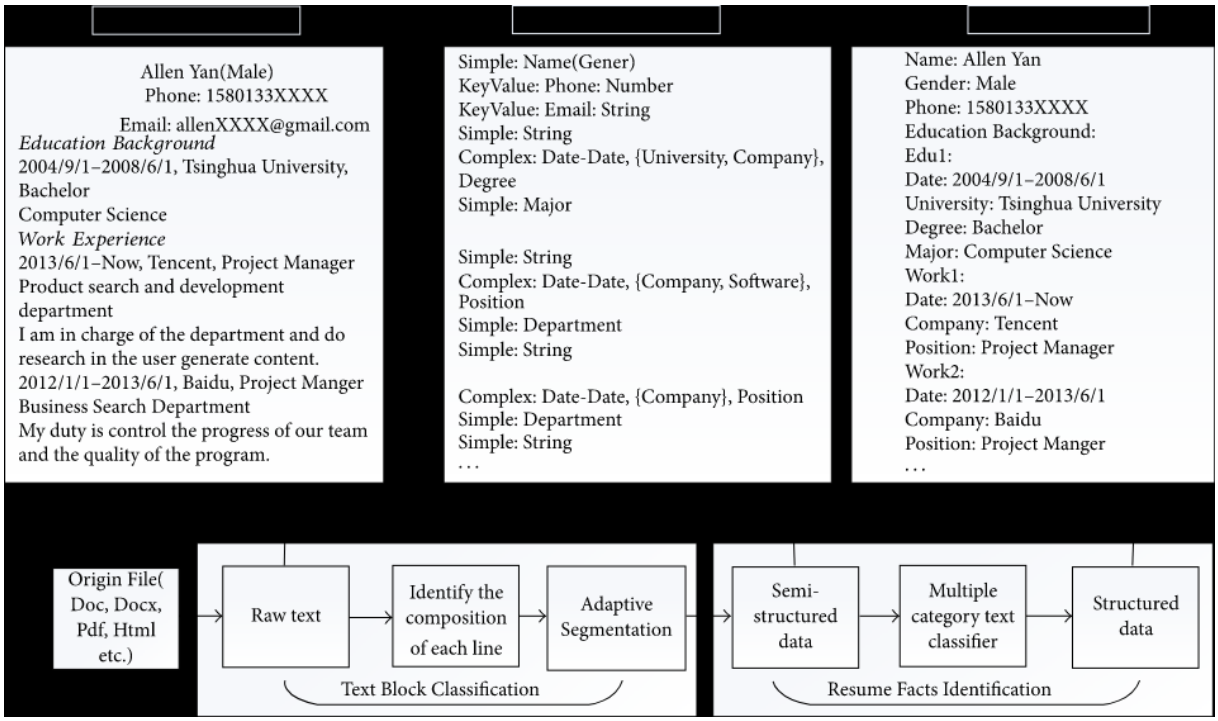
***Specialization:*** NLP

***Problem description:***

Resumes contain surfeit information that is not relevant for the HR/authority, and they have to manually process the resumes to shortlist the promising candidates for them. And, thus making the shortlisting task a herculean task for HR. By making use of the NER (Named Entity Recognition) model of NLP this problem can be solved by finding and classifying the entities that are present in each resume into predefined classes such as person name, college name, academics information, relevant experiences, skill set, etc.




***EDA:***

In order to provide meaningful insights through analyzing the resume extraction dataset, I started with creating a data frame containing the different labels of each resume unordered.

| | | |
|---|---|---|
| 0 | Companies worked at | oracle |
| 1 | Companies worked at | oracle |
| 2 | Companies worked at | oracle |
| 3 | Skills | languages: core java, go lang, data structures... |
| 4 | Companies worked at | oracle |
| ... | ... | ... |
| 3203 | Degree | b- tech |
| 3204 | Designation | security analyst |
| 3205 | Companies worked at | infosys - career contour |
| 3206 | Designation | security analyst |
| 3207 | Name | pradeep kumar |

3208 rows × 2 columns

I will be performing statistical analysis on each one of these elements except for the name, email and designation:

```
print(df[0].unique())
```

```
['Companies worked at' 'Skills' 'Graduation Year' 'College Name' 'Degree'
 'Designation' 'Email Address' 'Location' 'Name' 'Years of Experience']
```

So, I split the data according to each label:

| | 0 | text |
|---|---|---|
| 6 | Graduation Year | 2012 |
| 9 | Graduation Year | 2012 |
| 56 | Graduation Year | 2016 |
| 59 | Graduation Year | 2018 |
| 70 | Graduation Year | 2009 |
| ... | ... | ... |
| 3127 | Graduation Year | 2005 |
| 3130 | Graduation Year | 2013 |
| 3135 | Graduation Year | 2013 |
| 3136 | Graduation Year | 2013 |
| 3170 | Graduation Year | 2002 |

222 rows × 2 columns

| | | |
|---|---|---|
| 0 | Companies worked at | oracle |
| 1 | Companies worked at | oracle |
| 2 | Companies worked at | oracle |
| 4 | Companies worked at | oracle |
| 10 | Companies worked at | oracle |
| ... | ... | ... |
| 3186 | Companies worked at | infosys bpo ltd |
| 3189 | Companies worked at | infosys bpo ltd |
| 3192 | Companies worked at | infosys bpo ltd |
| 3194 | Companies worked at | infosys bpo ltd |
| 3205 | Companies worked at | infosys - career contour |

676 rows × 2 columns

| | 0 | text |
|---|---|---|
| 22 | Location | bengaluru |
| 35 | Location | hyderabad |
| 38 | Location | hyderabad |
| 39 | Location | hyderabad |
| 40 | Location | hyderabad |
| ... | ... | ... |
| 3183 | Location | bengaluru |
| 3185 | Location | bengaluru |
| 3188 | Location | bengaluru |
| 3191 | Location | bengaluru |
| 3197 | Location | bengaluru |

381 rows × 2 columns

| | 0 | text |
|---|---|---|
| 3 | Skills | languages: core java, go lang, data structures... |
| 5 | Skills | apex. (less than 1 year), data structures (3 y... |
| 28 | Skills | functional testing, blue prism, qtp |
| 53 | Skills | languages & technologies: python, r, sql, nos... |
| 55 | Skills | python (2 years), sql. (1 year), nosql (1 year... |
| ... | ... | ... |
| 3124 | Skills | sap hana (4 years), sap ui5/fiori (4 years), a... |
| 3155 | Skills | data backup (1 year), exchange (1 year), lan (... |
| 3163 | Skills | auditing (less than 1 year), cfa (less than 1 ... |
| 3169 | Skills | excel (10+ years), operations (7 years), proje... |
| 3201 | Skills | splunk, network security, arc sight (2 years),... |

417 rows × 2 columns

I also applied some preparation on my data frame in order to make it easier to use with the matplotlib and the seaborn libraries.

Transforming all the text into lower case, removing unnecessary spaces, transforming dates into numeric variables, and removing unnecessary words.

```
0                          oracle
1                          oracle
2                          oracle
4                          oracle
10                         oracle
                    ...
3186              infosys bpo ltd
3189              infosys bpo ltd
3192              infosys bpo ltd
3194              infosys bpo ltd
3205    infosys - career contour
Name: text, Length: 676, dtype: object
```

```
[ ] stopwords = ['what', 'who', 'is', 'a', 'at', 'is', 'he','of','university','college','public','private','school','institute','academy']
    L4=CollegeN["text"]
    L=list(L4)
    H=[]
    L3=[]
    for i in range(291):
      H=L[i].split()
      L1 = [word for word in H if word.lower() not in stopwords]
      L2= ' '.join(L1)
      L3.append(L2)

    print(L3)
```

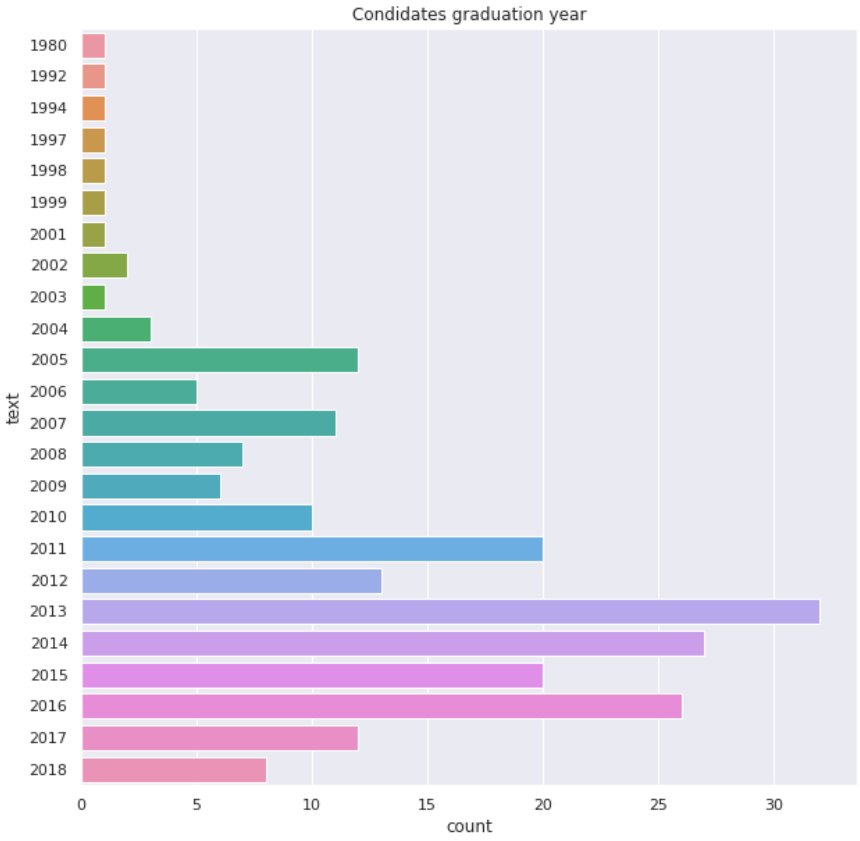
```
['adithya', 'osmania', 'osmania', 'manipal', 'manipal', '', 'birla', 'rashtriya military bangalore', 'rashtriya military bangalore', 'army', 'acharya chembur',
```

```
Gradyear["text"]=pd. to_numeric(Gradyear["text"])
type(Gradyear['text'][6])
```

```
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py
A value is trying to be set on a copy of a slice from a Data
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.
  """Entry point for launching an IPython kernel.
numpy.int64
```

Starting with the graduation year:

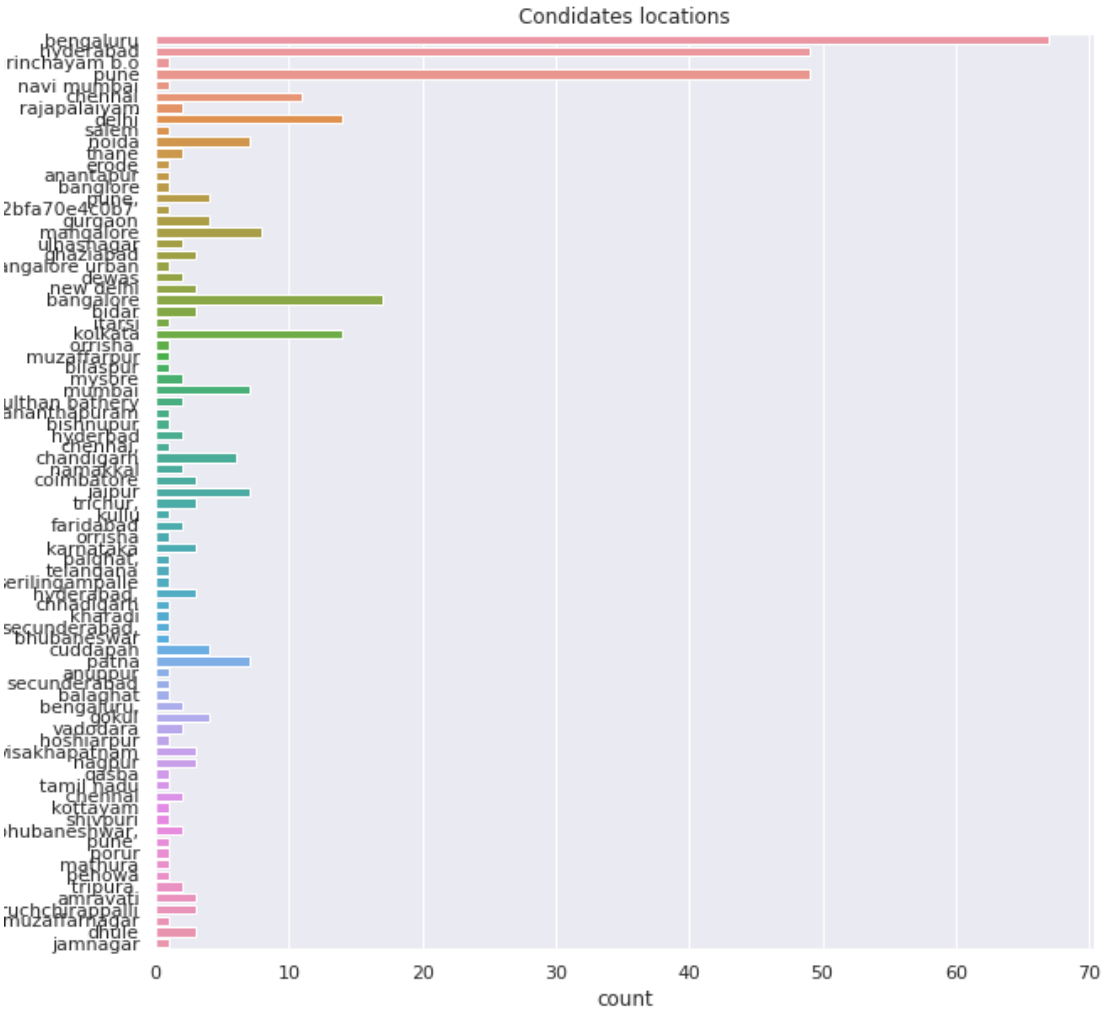



We can see that most of the candidates graduated after 2005.

16% of the candidates graduated on 2013 only and 50% of hem graduated between 2016 and 2013.

No condidates graduated after 2018.

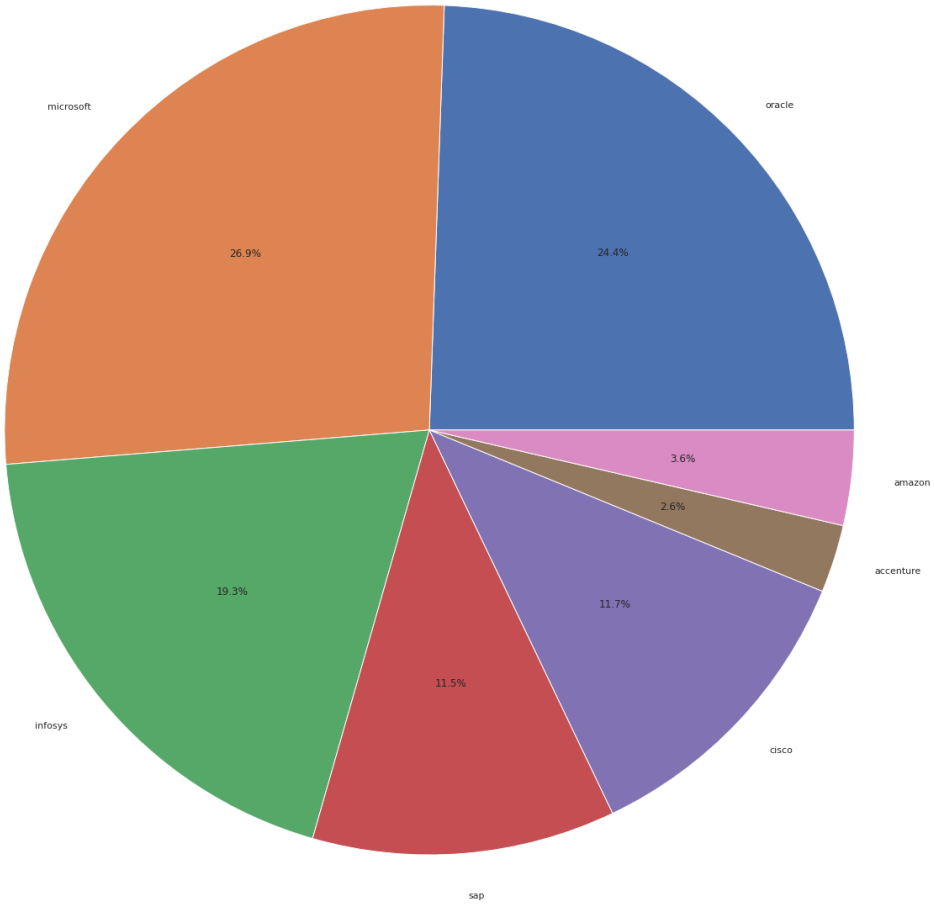
Next, I have condidates locations:



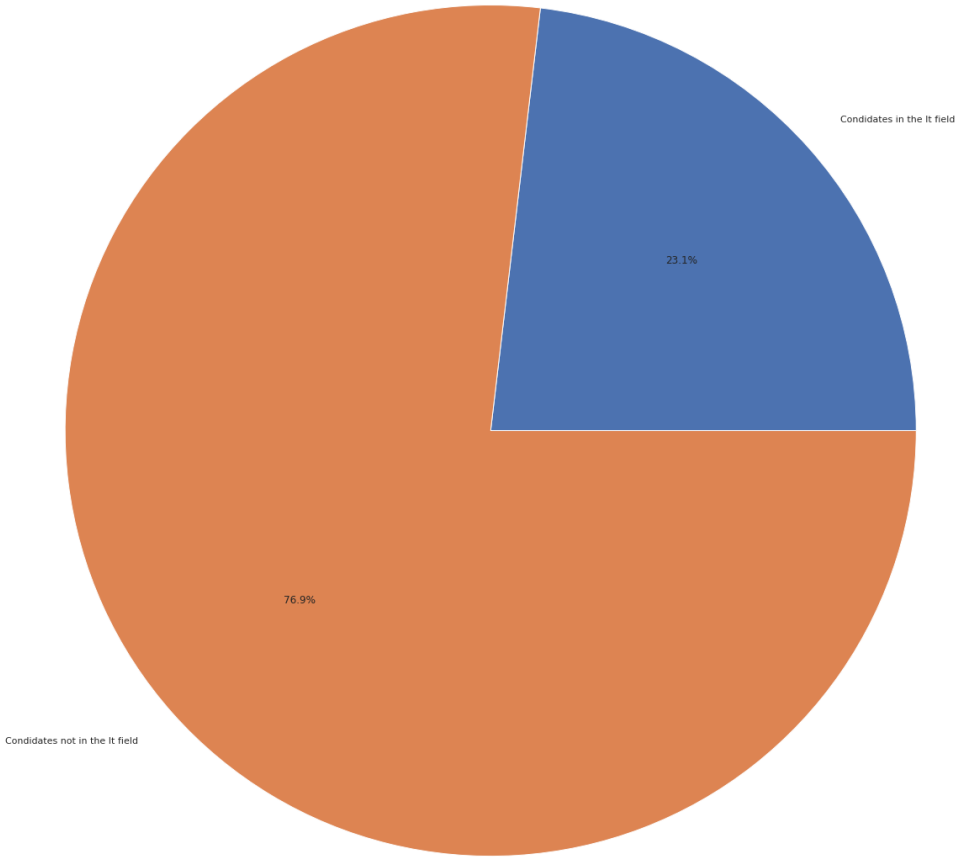

The majority of the candidates are located in Bengaluru (67 out of 200), Hyderabad and Pune (49 in each one).

As for, the 'Companies worked at' data frame the following chart shows that Oracle, Microsoft, SAP, Cisco, NIIT and Infosys are the ones with the biggest numbers of candidates having worked at them in the past.


At least 155 out of 200 (26.9% as we can see through this chart below) candidates worked at Microsoft before, 142 out of 200(24.4%) worked at Oracle.



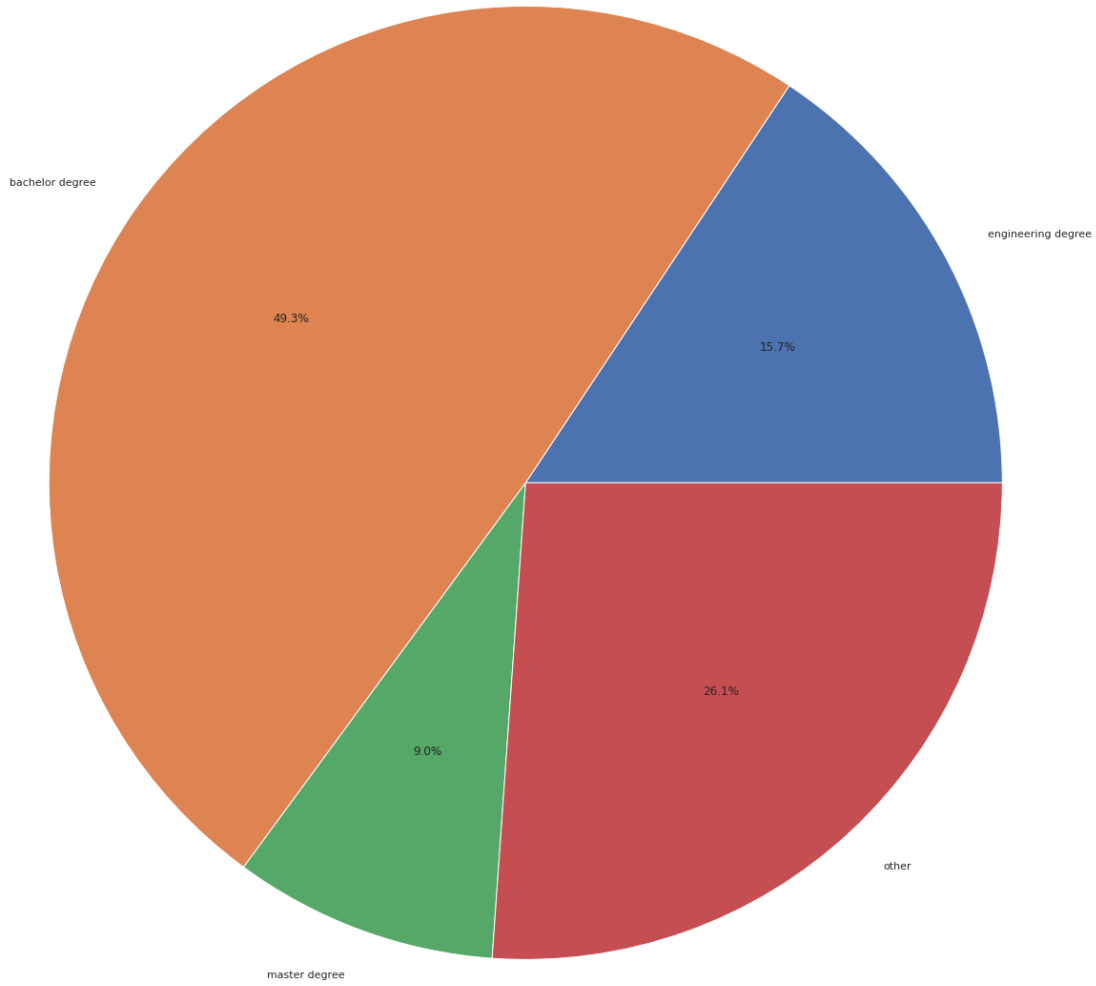

Analyzing the “Degree “data frame allowed me to find out that only 23.1% of the candidates for this job are in the IT field while the rest of them have different fields of study such as: business chemistry electronics etc.




49.3% of the candidates have a bachelor degree.

15.7% of them are engineers.

9% candidates have a master degree.




Analyzing the universities, the candidates studied at I figured out that almost each one went to a different college.

```
CollegeN["text"]=L3
len(CollegeN["text"].unique())
```

```
/usr/local/lib/python3.7/dist-packages
A value is trying to be set on a copy
Try using .loc[row_indexer,col_indexer

See the caveats in the documentation:
  """Entry point for launching an IPyt
238
```

Depending on these insights, the client's HR department can request the elimination of some candidates' categories depending on the job profile needed (example: the client needs candidates with engineering degree)

Also, this EDA has shown that those who applied for this job are quite different especially when talking about the fields of study, I recommend that the HR department takes more care of the job description and the requirements provided in order to have a more accurate candidates resumes.

***GitHub Repo link:*** https://github.com/NadaBelaidi/NLP-Resume-Extraction