

Automated Resume Screening Using Machine Learning And Knowledge Graph

Arya A and Ms.Lekshmi S Nair

Amrita University

Problem

Choosing the right people for the job is the biggest responsibility of every business since choosing the right set of people can accelerate business growth exponentially. Due to the high number of applicants and resumes submissions to job postings, manual resumes screening processes become tedious, ineffective and time consuming for talent acquisition professionals. Hence in this project we implement automated Resume Screening using Machine Learning And Knowledge Graph

Introduction

- Resume play a good role in getting suitable jobs in all sectors.
- Due to many big projects with big companies, their team does not have time to read resumes and choose the best resume according to their requirements.
- Standardized automated screening methods are necessary to categorize qualified and unqualified candidates based on their background, education and professional experience faster
- To solve this problem we do automated resume screening using Knowledge Graph and Machine Learning

Related Work

- Constructing knowledge graph from unstructured text
- Openie-based approach for knowledge graph construction from text[1]
- Construction of an Industrial Knowledge Graph for Unstructured Chinese Text Learning [2]
- Knowledge graph construction from text collections.[3]

Approach/Solution

- We do automated resume screening using Machine Learning initially then we will do by constructing knowledge graph.
- Initially we will select the dataset
- We do implementation using machine learning we will do exploratory analysis, then do data preprocessing after that we will build the entire model.
- While building the model we use the one v/s rest method and also use the KNeighbour classifier.
- When constructing knowledge graph using resume firstly we parse the data, then create the knowledge graph, after that we will visualise the connected graph and finally extract information and traverse it.

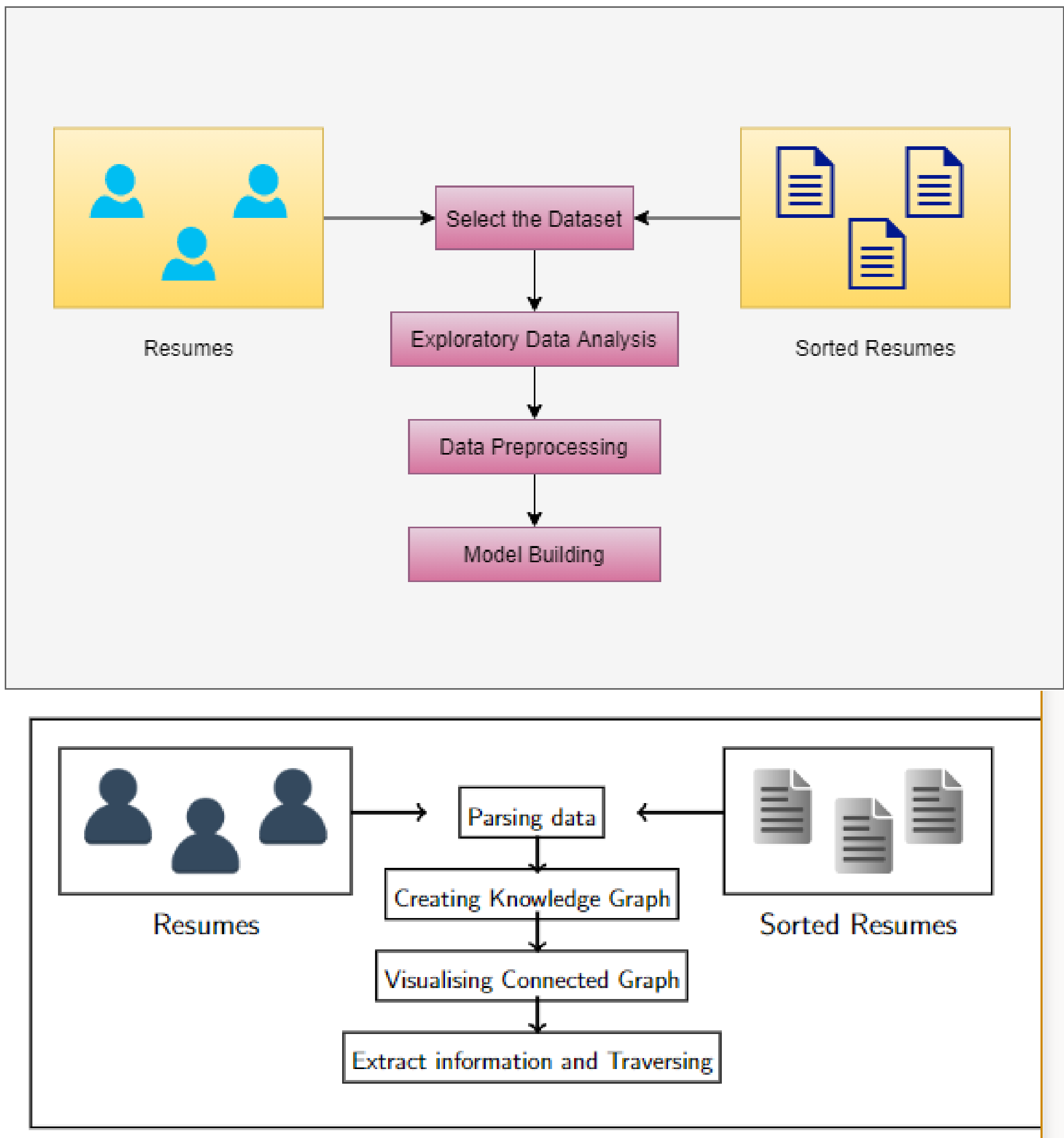


Figure 1:Workflow Diagram

Data Summarization

- Dataset is taken from Kaggle, <https://www.kaggle.com/gauravduttakiit/resume-dataset>[4][5]
- There are only two columns we have in the data. Below is the definition of each column. Category: Type of Job Resume fits for and Resume: Resume of candidates
- There are 962 observations we have in the data. Each observation represents the complete details of each candidate so we have 962 resumes for screening.
- While creating knowledge graph we will take some dummy resumes from the dataset

Result

We will get the accuracy in both training set and test set using KNeighbour classifier as 0.99. We just classified almost 1000 resumes in few minutes into their respective categories with 99

	precision	recall	f1-score	support
0	1.00	1.00	1.00	3
1	1.00	1.00	1.00	3
2	1.00	0.80	0.89	5
3	1.00	1.00	1.00	9
4	1.00	1.00	1.00	6
5	0.83	1.00	0.91	5
6	1.00	1.00	1.00	9
7	1.00	1.00	1.00	7
8	1.00	0.91	0.95	11

Figure 2:Workflow Diagram

References

- [1] Kundan Kumar and Siddhant Manocha. Constructing knowledge graph from unstructured text. *Self*, 3:4, 2015.
- [2] Natthawut Kertkeidkachorn and Ryutaro Ichise. T2kg: An end-to-end system for creating knowledge graph from unstructured text. In *Workshops at the Thirty-First AAAI Conference on Artificial Intelligence*, 2017.
- [3] Jose L Martinez-Rodriguez, Ivan Lopez-Arevalo, and Ana B Rios-Alvarado. Openie-based approach for knowledge graph construction from text. *Expert Systems with Applications*, 113:339–355, 2018.
- [4] Xindong Wu, Jia Wu, Xiaoyi Fu, Jiachen Li, Peng Zhou, and Xu Jiang. Automatic knowledge graph construction: A report on the 2019 icdm/icbk contest. In *2019 IEEE International Conference on Data Mining (ICDM)*, pages 1540–1545. IEEE, 2019.
- [5] Jianzhuo Yan, Tiantian Lv, and Yongchuan Yu. Construction and recommendation of a water affair knowledge graph. *Sustainability*, 10(10):3429, 2018.
- [6] Mingxiong Zhao, Han Wang, Jin Guo, Di Liu, Cheng Xie, Qing Liu, and Zhibo Cheng. Construction of an industrial knowledge graph for unstructured chinese text learning. *Applied Sciences*, 9(13):2720, 2019.
- [7] Ryan Clancy, Ihab F Ilyas, and Jimmy Lin. Scalable knowledge graph construction from text collections. In *Proceedings of the Second Workshop on Fact Extraction and VERification (FEVER)*, pages 39–46, 2019.
- [8] Haoze Yu, Haisheng Li, Dianhui Mao, and Qiang Cai. A relationship extraction method for domain knowledge graph construction. *World Wide Web*, 23(2):735–753, 2020.
- [9] Aman Mehta, Aashay Singhal, and Kamalakara Karlapalem. Scalable knowledge graph construction over text using deep learning based predicate mapping. In *Companion Proceedings of The 2019 World Wide Web Conference*, pages 705–713, 2019.
- [10] Hehua Yan, Jun Yang, and Jiafu Wan. Knowime: A system to construct a knowledge graph for intelligent manufacturing equipment. *IEEE Access*, 8:41805–41813, 2020.