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Professor Lapets

CS504: Data Mechanics

Project 3 Report

Narrative

Amman, Jordan is a neoliberal city that has undergone rapid growth within the last one hundred years. Furthermore, following the 2016 General Election, sentiments regarding young people in Amman highlighted the rapid growth of the city into a more conductive democratic and social society. In order to map Amman, we decided to look more specifically at the younger Jordanians. By utilizing the intersection of social media and mapping, we were able to look at where people spend their time, how educated they are, and their demographics. Furthermore, we were able to analyze whether young Jordanians in Amman are happy with political life and the current state of affairs. In order to make these connections and analysis, we used the following: a data set containing educational status (bachelor's degree, graduate degree, etc.), employment rates per year, and gender and a data set containing employment rates per year, degree type, and gender. These data sets came from Kaggle and Knoema respectively. Furthermore, we scraped Tweets from Twitter regarding the 2016 General Election from young people that live in Jordan, including Amman. We also scraped LinkedIn profiles containing information on employment and education. The rest of this report describes methods, analysis, results, and conclusions for our project.

Methods

For project one, we completed three transformations from the data sets that we collected from Kaggle and Knoema. Each transformation includes the provenance document describing everything that occurred and the data sets' origination in each script. Furthermore, each run of the scripts used, generated a new document describing the invocation event. Secondly, each

transformation included its attributions, generations, and derivations. To transform these data sets, we used these building blocks in the relational model: selection, projection, aggregation, and product.

For project two, we implemented a non-trivial optimization technique via k-means where k = 4. In addition, we used an existing script to calculate three correlation coefficients. Those correlation coefficients also required us to calculate means, standard deviations, and covariances.

For project three, we scraped data from Twitter based on location, users, hashtags, retweets, and mentions. This was done by filtering nearly 12000 tweets with keywords 'jobs,' 'profession,' 'skills,' and other key words. 400 of the 12000 tweets had locations active. Thus, leading us to our sentiment analysis of Jordan by categorizing tweets into positive, negative, or neutral sentiments. Then, we aggregated the average sentiment of the district. We also scraped data from LinkedIn based on university degrees, professional skills, foreign languages spoken, and English Training Centers. Using this data, we conducted a statistical analysis and sentiment analysis to create visualizations. Furthermore, three data visualizations based on the linkedin data from project were implemented. The data came from mongodb and used them to generate the figures in the html file by using JQuery and Chart.JS. In addition, we implemented an interactive web-service based on the linkedin data as well. For example, you can view the refined linkedin data by visit http://localhost:5000/linkedin. Furthermore, you can also insert the new linkedin data and view them by first click the insert data link on the main page and input the features you got, and then go back to http://localhost:5000/linkedin you can see the data you inserted is already there. To clarify, the insert does not allow users to directly modify the linkedin data for privacy reasons, but to achieve this would not be difficult by simply change several lines of code.

Results

Mapping Amman

Check Top 10 Skills IT Employees in Amman have (Visualized)

Check which Degree is more popular in Amman for IT Employees (Visualized)

Check Top 5 Most Popular Univerisities in Amman (Visualized)

Linkedin Data (Refined)

Insert Linkedin Data

Figure 1: Mapping Amman. Highlights the visualizations created for project 3.
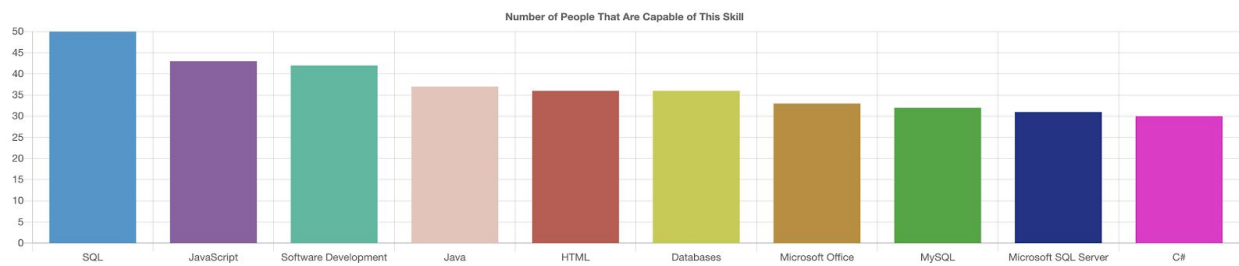

Figure 2: Technical Skills. Highlights the top technical skills employees' in Amman possess. This data was collected from LinkedIn profiles.
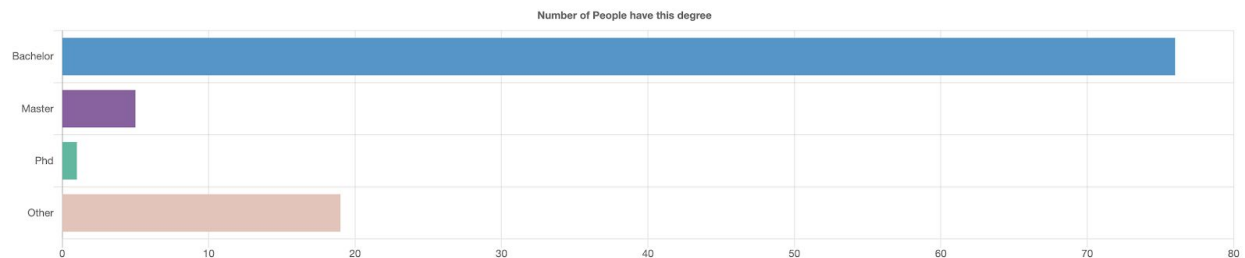

Figure 3: Degrees. Highlights the degree level of employed Jordanians in Amman. This data was collected from LinkedIn profiles.
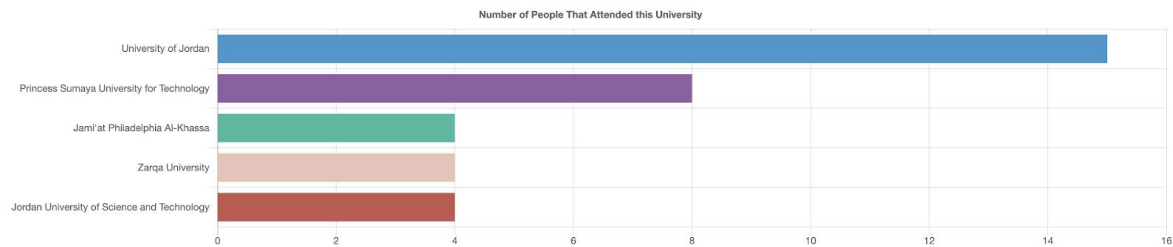
Number of People That Attended this University

Figure 4: Universities in Amman. Highlights the universities that employed Jordanians attended. This data was collected from LinkedIn profiles.

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    "English": 0,
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    "Organization Title 1": "CEO",
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: 22, Online Marketing : 21, Start-ups : 19, Web Applications : 15, Digital Marketing : 13, Business Development : 13, Marketing Communications : 12, Cloud Computing : 12, SEO
Product Management : 11, Social Media Marketing : 8, Strategy : 7, User Experience : 5, Mobile Devices : 5, Web Analytics : 3, SEM : 3, Digital Strategy : 3, Marketing : 2, Sea
Engine Optimization (SEO) : 2, Customer Relationship Management (CRM)            Customer Relationship Management (CRM) : 1, Team Leadership : 32, Strategic
Partnerships : 2, New Business Development : 10, "
  },
  {
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    "Skills": "PL/SQL : 0, MYSQL : 0, C# : 0, Artificial Intelligence : 0, Algorithms : 0, Data Structures : 0, Web Services : 0, SQL : 0, ASP.NET MVC : 0, Microsoft SQL Server
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Office : 0, jQuery : 0, R : 0, Matlab : 0, Entity Framework : 0, AJAX : 0, Problem Solving : 0, UWP : 0, XAML : 0, Web Hosting : 0, Oracle Forms : 0, Oracle Reports : 0, Geneti
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    "Organization End 1": "PRESENT",
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    "Organization Title 1": "Managing Director",
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17, Program Management : 16, Pre-sales : 15, Strategy : 13, Project Planning : 11, Web Services : 8, IT Management : 7, Software Engineering : 6, Cloud Computing : 6, Product
Management : 5, Business Intelligence : 5, VoIP : 3, Architecture : 3, IT Strategy : 3, Enterprise Architecture : 2, Database Design : 1, Design Patterns : 0, Requirements Gath
: 0, WCF : 14, Enterprise Software : 8, Databases : 7, ASP.NET : 6, C# : 6, Microsoft SQL Server : 5, UML : 5, XML : 4, .NET : 3, IIS : 0, Visual Studio : 0, Management : 25,
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    "Education Degree 1": "Bachelor of Science - BS",
    "English": 1,
    "Full name": "Mohammad Altaleb",
    "Organization 1": "UniTicker",
  }


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    "Education Degree 1": "Master",
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    "Organization End 1": "",
    "Organization Start 1": "",
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    "Skills": "Swift, SQL, Microsoft Office"
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    "Education 1": "University of Jordan",
    "Education Degree 1": "MBA",
    "English": 0,
    "Full name": "Ali Hajjaj",
    "Organization 1": "Imagine Technologies",
    "Organization End 1": "PRESENT",
    "Organization Start 1": "Jan 2001",
    "Organization Title 1": "CEO",
    "Skills": "E-commerce : 99, Online Advertising : 65, Mobile Applications : 64, Web Development : 57, CRM : 32, Entrepreneurship : 25, Project Management : 23, Marketing Strategy
: 22, Online Marketing : 21, Start-ups : 19, Web Applications : 15, Digital Marketing : 13, Business Development : 13, Marketing Communications : 12, Cloud Computing : 12, SEO : 11,
Product Management : 11, Social Media Marketing : 8, Strategy : 7, User Experience : 5, Mobile Devices : 5, Web Analytics : 3, SEM : 3, Digital Strategy : 3, Marketing : 2, Search
Engine Optimization (SEO) : 2, Customer Relationship Management (CRM)            Customer Relationship Management (CRM) : 1, Team Leadership : 32, Strategic
Partnerships : 2, New Business Development : 10, "
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    "Education 1": "Jerash University",
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    "Full name": "Osama Allabwani",
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    "Organization Title 1": "Oracle Developer",
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Windows Presentation Foundation (WPF) : 0, C++ : 0, HTML : 0, CSS : 0, WordPress : 0, Oracle Database : 0, Bootstrap : 0, Javascript : 0, Adobe Photoshop : 0, Windows : 0, Microsoft
Office : 0, jQuery : 0, R : 0, Matlab : 0, Entity Framework : 0, AJAX : 0, Problem Solving : 0, UWP : 0, XAML : 0, Web Hosting : 0, Oracle Forms : 0, Oracle Reports : 0, Genetic
Algorithms : 0, "
  },
  {
    "Education 1": "University of Jordan",
    "Education Degree 1": "Bachelor",
    "English": 2,
    "Full name": "Feras Arafeh",
    "Organization 1": "Leading Point",
    "Organization End 1": "PRESENT",
    "Organization Start 1": "Jan 2010",
    "Organization Title 1": "Managing Director",
    "Skills": "Telecommunications : 66, Integration : 63, Solution Architecture : 55, Software Project Management : 30, Software Development : 29, Requirements Analysis : 21, SOA :
17, Program Management : 16, Pre-sales : 15, Strategy : 13, Project Planning : 11, Web Services : 8, IT Management : 7, Software Engineering : 6, Cloud Computing : 6, Product
```

Figure 5: Data. Represents the results collected from the LinkedIn data.

Insert New LinkedIn Data!

Please fill data in the form below:

Name: Steve Jobs
Education Institute: Harvard University
Educational Degree: Master
Company: Apple
Title: CEO
English Ability(0 represents no, 1 represents yes, 2 represents unknown): 1
Skills: Swift, SQL, Microsoft
Submit

Back to Welcome Page

Figure 6: Form. An interactive visualization that was created for the web-service component of project 3.
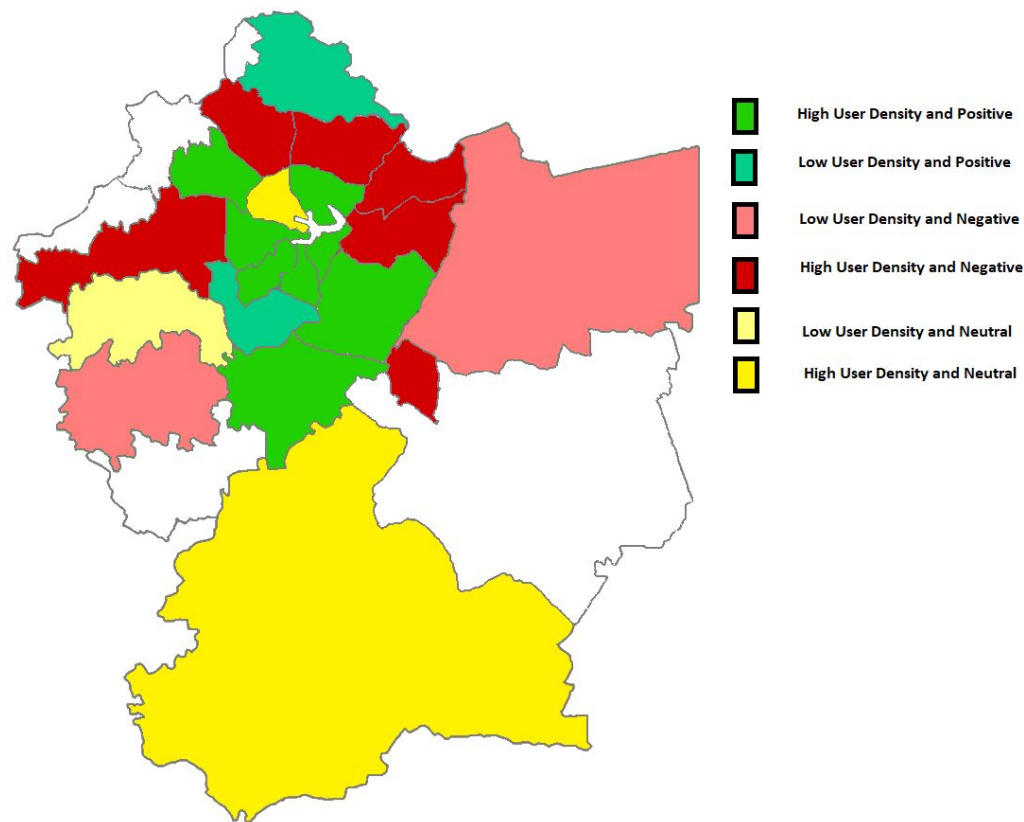

Figure 7: Sentiment Analysis. Map of Jordan that highlights user density and sentiments (positive, negative, or neutral) based on the 2016 General Election in Jordan. This data was collected from users on Twitter.

Conclusions

For the LinkedIn portion of the project, due to the restrictions, we were only able to collect data related to IT employees. Based on the data, we concluded what skills and degrees a person in

Amman needs to have an IT-related job. Nearly all of them can speak English, which means speaking English is an indispensable skill. Furthermore, for the Twitter portion of the project, we were able to conclude that sentiments regarding the 2016 General Election varied (positive, negative, or neutral) across the country of Jordan. For Amman, Jordan, the average sentiment was positive and density was higher. Based on the data sets from project one to the collection from LinkedIn and Twitter, we were able to map Amman in a neoliberal context by looking at young people in Jordan, their demographics, and their sentiments.

Future Work

In the future, it would be interesting to complete a similar analysis of upcoming elections in Jordan to compare to the 2016 Election. Thus, analyzing the progression, if any, of a neoliberal city. Furthermore, expanding our data set to include political parties for further analysis, additional data from different social media platforms such as Instagram and Facebook, and any local websites to connect young Jordanians in Amman.