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GIRO Conference 2022

21-23 November, ACC Liverpool

#GiroConf22





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Trends in Actuarial job data

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#GiroConf22



Agenda

- Background
- Sourcing the data
- Exploring the data
- Gender coding language
- Q&A

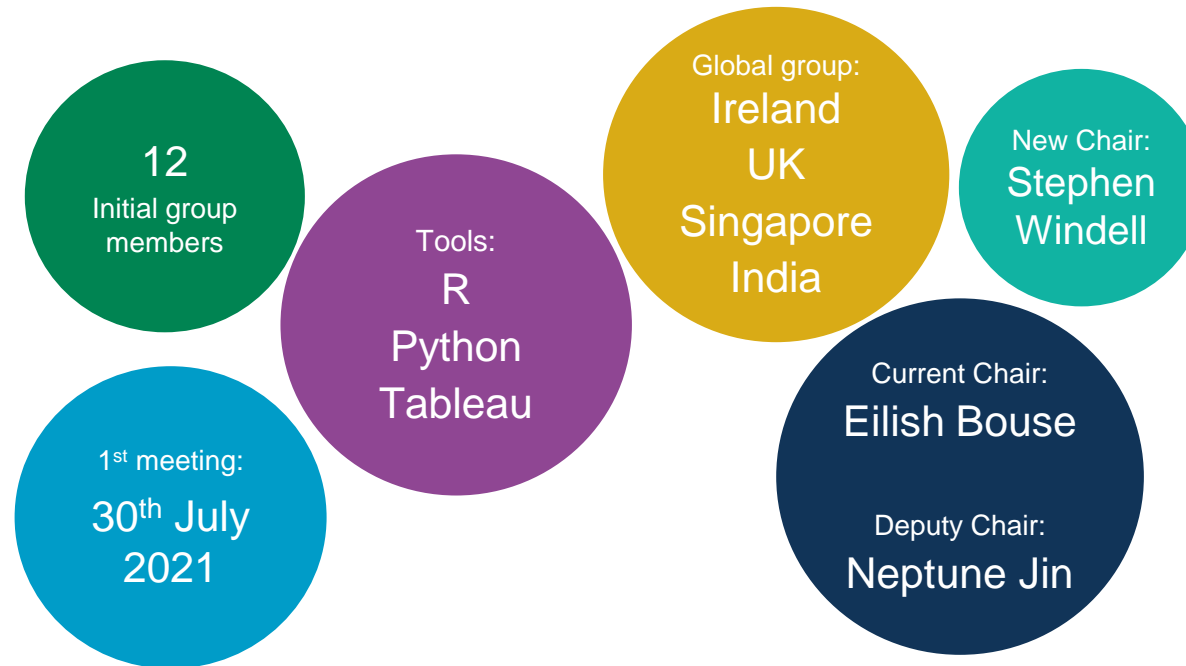


Data Visualisation Working Party

One of the Data Science Working Parties in the Research pillar

GitHub: <https://ifoadatascienceresearch.github.io/>

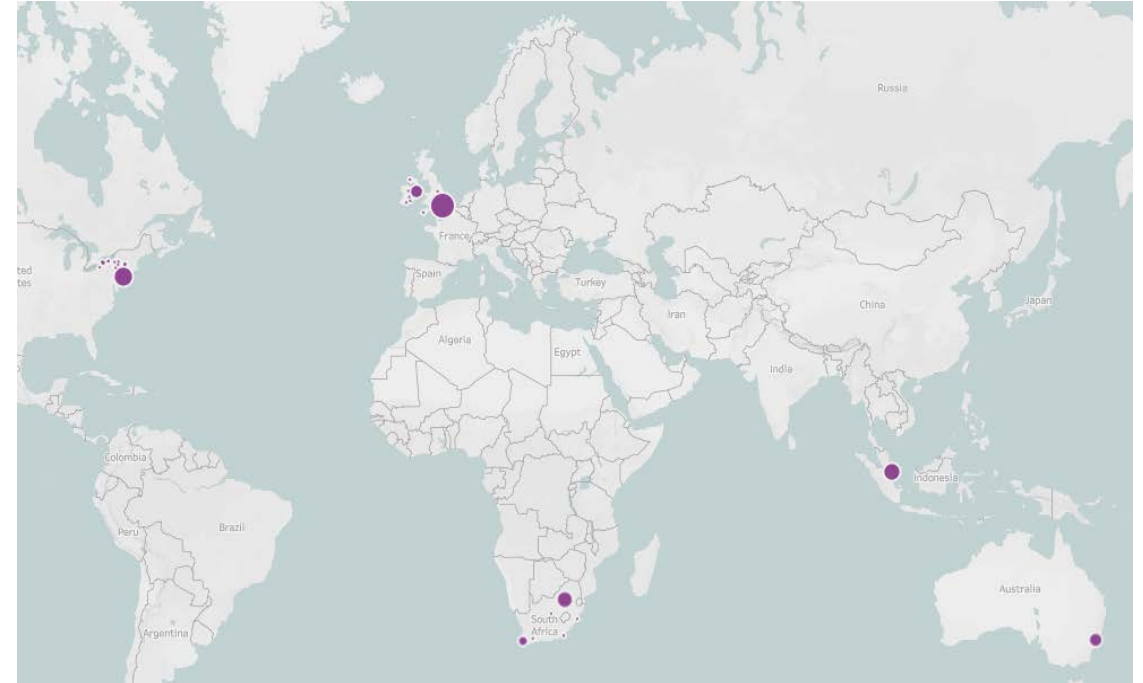
Aim: Investigate tools and packages available to perform data visualisation and produce outputs that conform to best practice in the area.



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Sourcing the Data

- Data comes from LinkedIn
- Anonymised scraper sourced from this GitHub:
<https://github.com/spinlud/linkedin-jobs-scraper>
- Six global locations chosen:
 - Dublin
 - London
 - New York
 - Johannesburg
 - Sydney
 - Singapore
- Weekly from Aug '21-Oct '22



Cleaning the data

- Data pre-processing similar to what is done for Natural Language Processing (NLP)

- Steps involved:

- Lowercase title, company, description
- Remove punctuation
- Consideration of stopwords
- No tokenization or stemming at this stage

job_id	title	company	date	place	location	description	seniority_level	job_function	employment_type
2810335898	pricing actuary, life & health	partnerre	2022-03-24	Singapore, Singapore	Singapore	we are looking to hire a life and health prici...	Associate	Other and Analyst	Full-time
3219949082	actuary, fsa - remote	staff financial group	2022-08-18	New York, NY	New York	actuary, fsa remote top company\n\n\n\nthe...	Associate	Finance and Sales	Full-time
3258296859	make your mark in specialty gi pricing	star actuarial futures	2022-09-08	London, England, United Kingdom	London	an exciting opportunity for a part qualified g...	Associate	Finance	Full-time

- Seniority Level had a proportion of roles as “Not Applicable” or “Null”. These were amended using the title information
- Location was updated to be one of six cities – primarily for use in Tableau
- Some simple company updates for consistency e.g. WTW



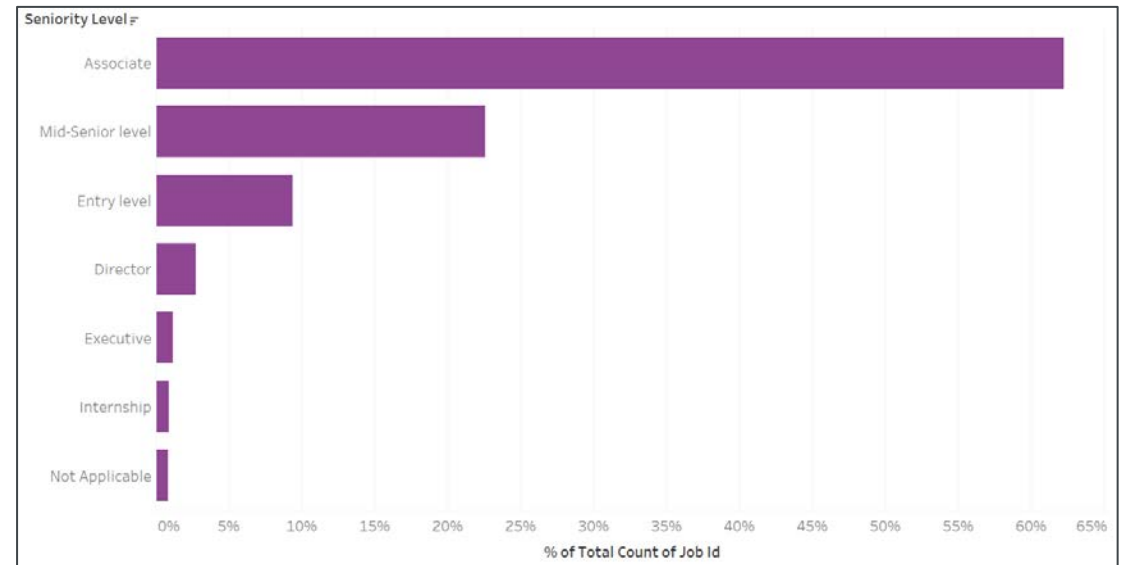
Exploring the data

- Total Job Ids **9,993**

Job count by Location:



Job count by Seniority Level:



Top 3 job functions	Count of Job ID
Finance and Sales	66%
Finance	5%
Other	4%

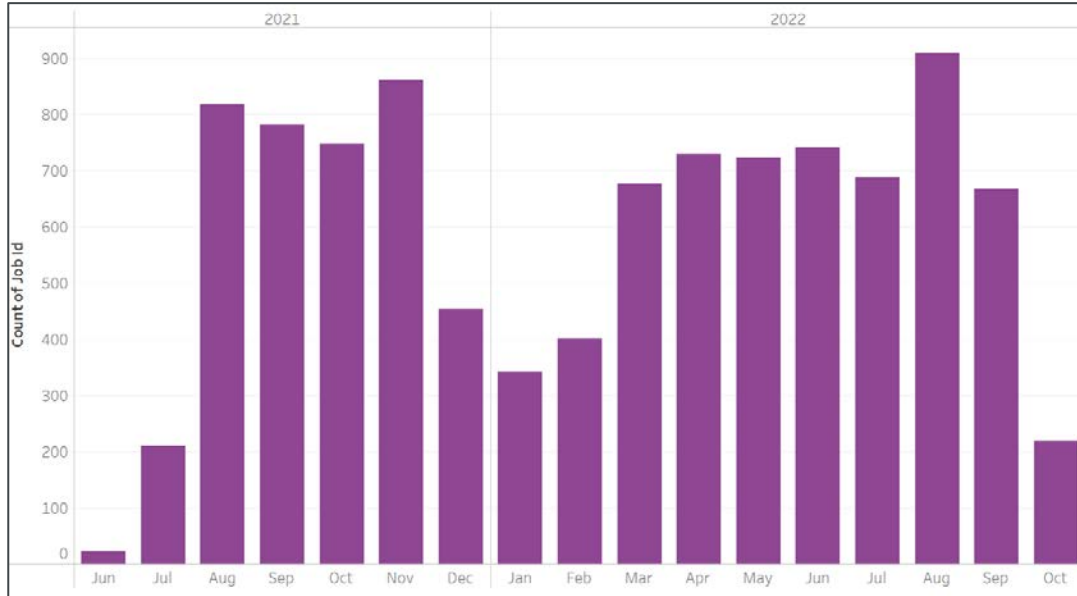
Top 3 Industries	Count of Job ID
Insurance	20%
Staffing and Recruiting	17%
Financial Services	8%



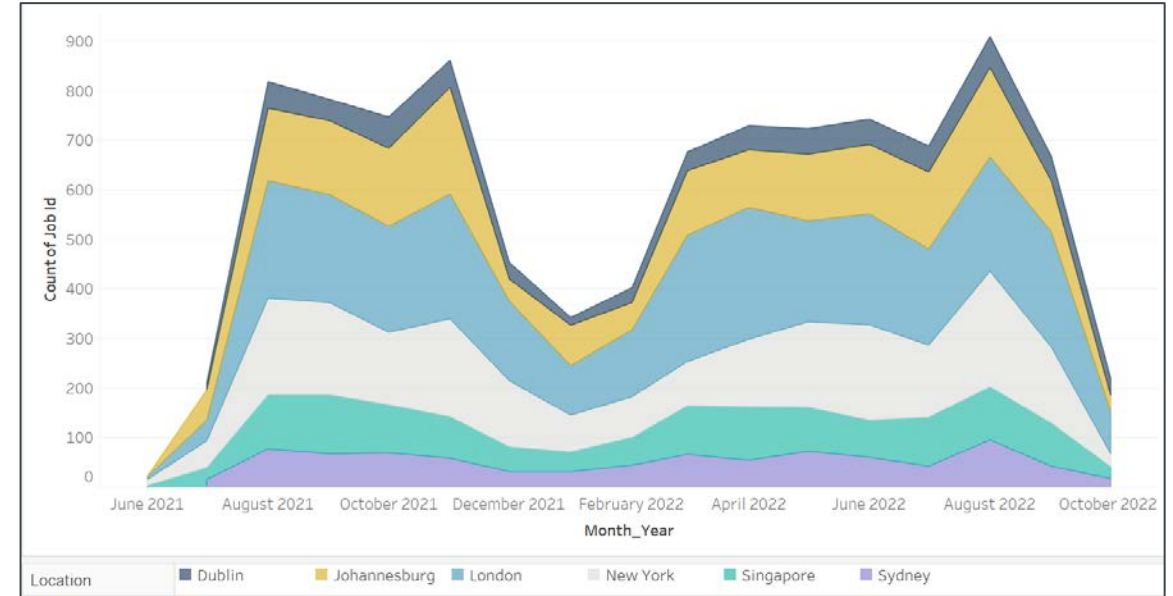
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Exploring the data

Job counts by date:

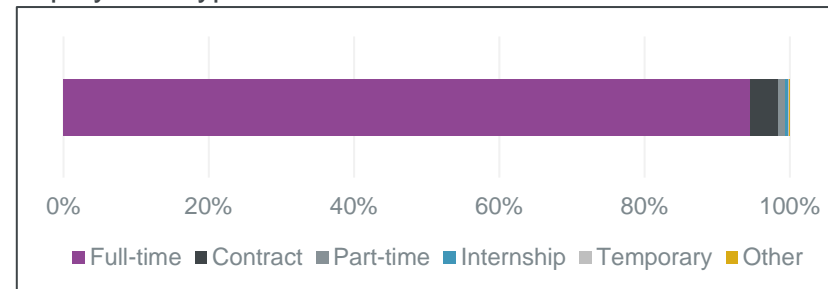


Job counts by date and location:



Top 3 companies	Count of Job ID
Mass Staffing Projects	7%
Oliver James	4%
Jobs via eFinancial	3%

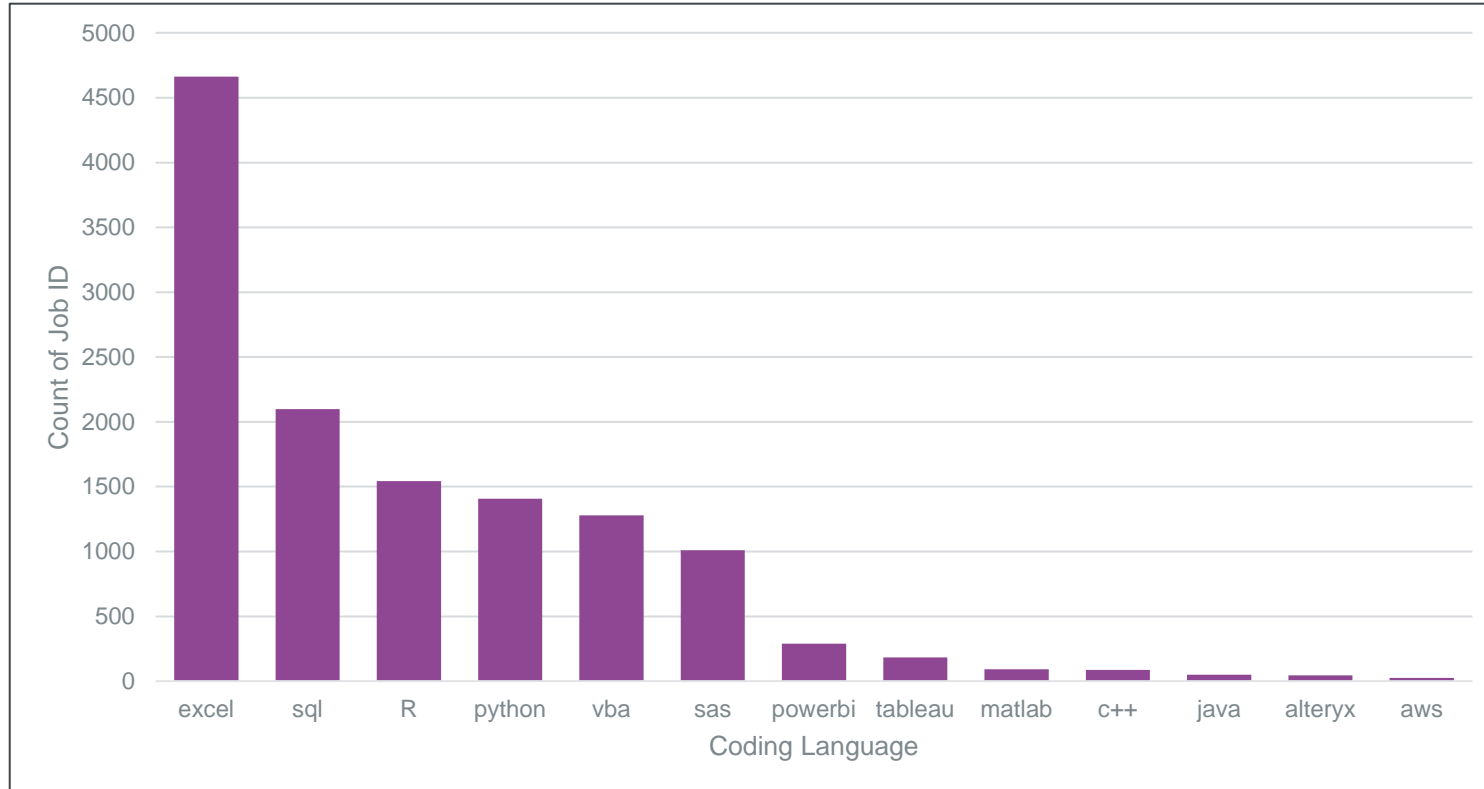
Employment type:



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Exploring the data – Data Science

Overall:



- **2,418** jobs mention 'analytics'
- **444** jobs mention 'data science'
- **324** jobs mention 'machine learning'
- **464** jobs mention 'predictive'
- **106** jobs mention 'cloud'

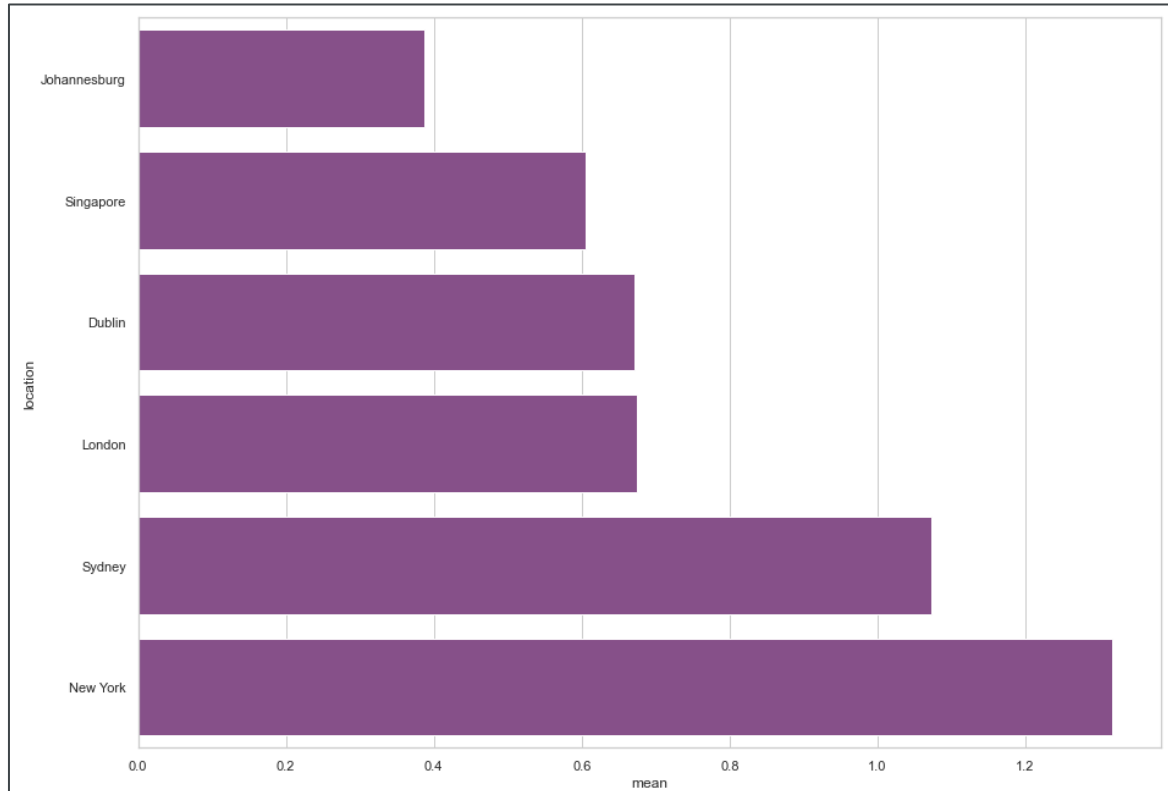


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Exploring the data – Data Science

- **184** jobs have ‘data’ in the job title

Average number of languages:



pensions data actuary (any uk location)
senior analyst, data management
health actuary - data science
actuary/data specialist
vp, actuary, product risk mgmt & data science

Languages considered:

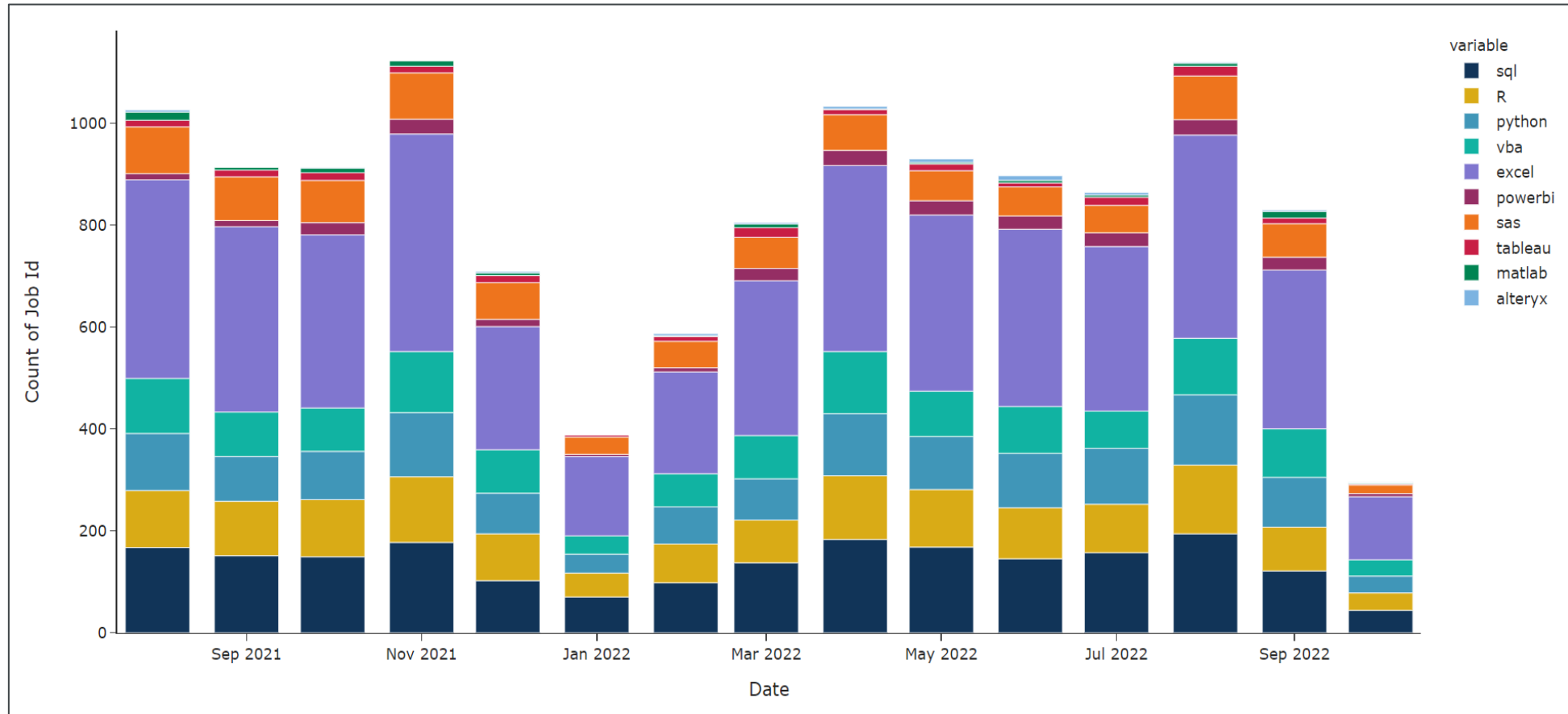
- SQL
- R
- Python
- SAS
- VBA
- Matlab
- Alteryx
- Power BI
- Tableau



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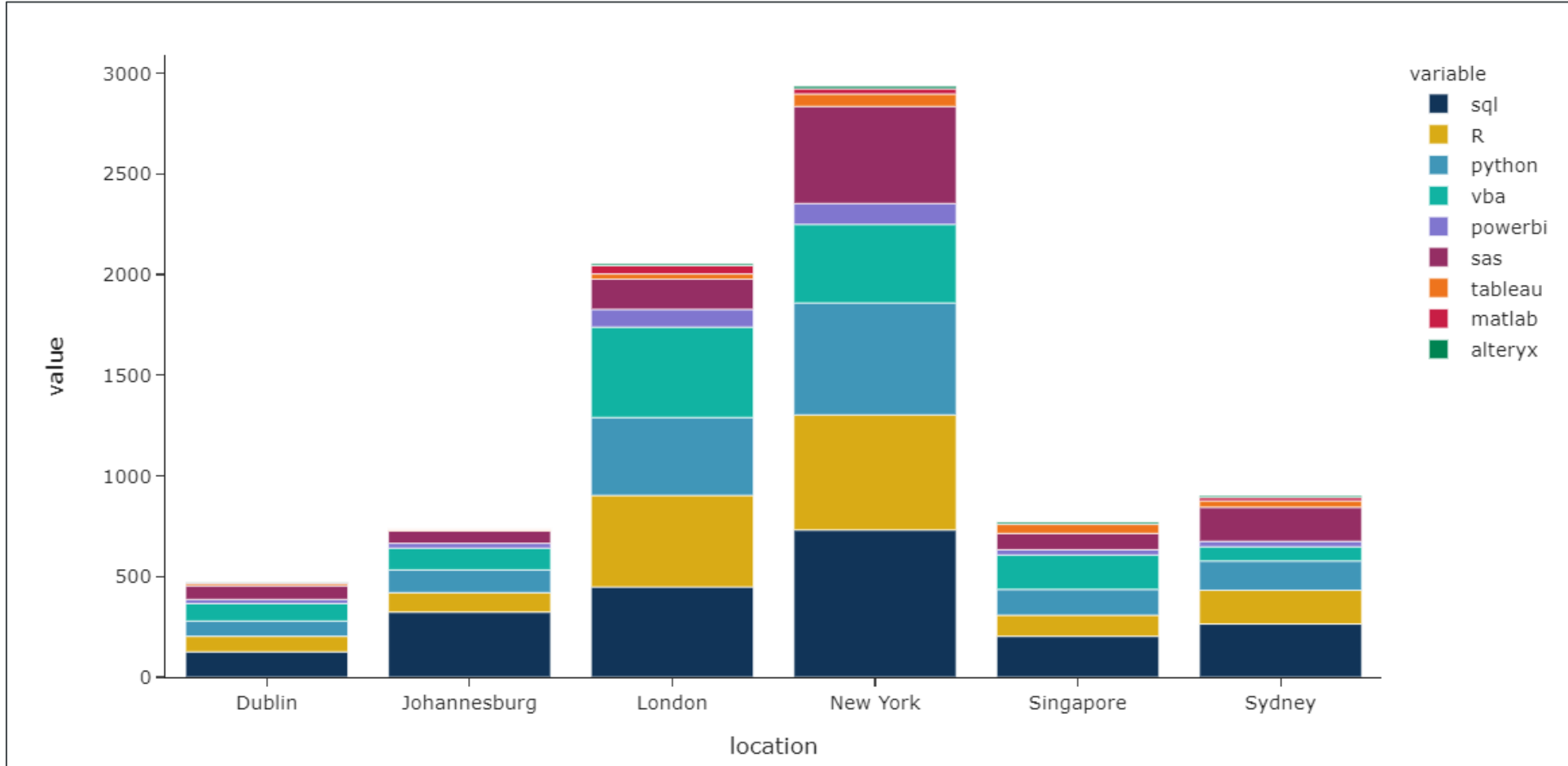
Exploring the data – Data Science

What coding languages are pursued:



Exploring the data – Data Science

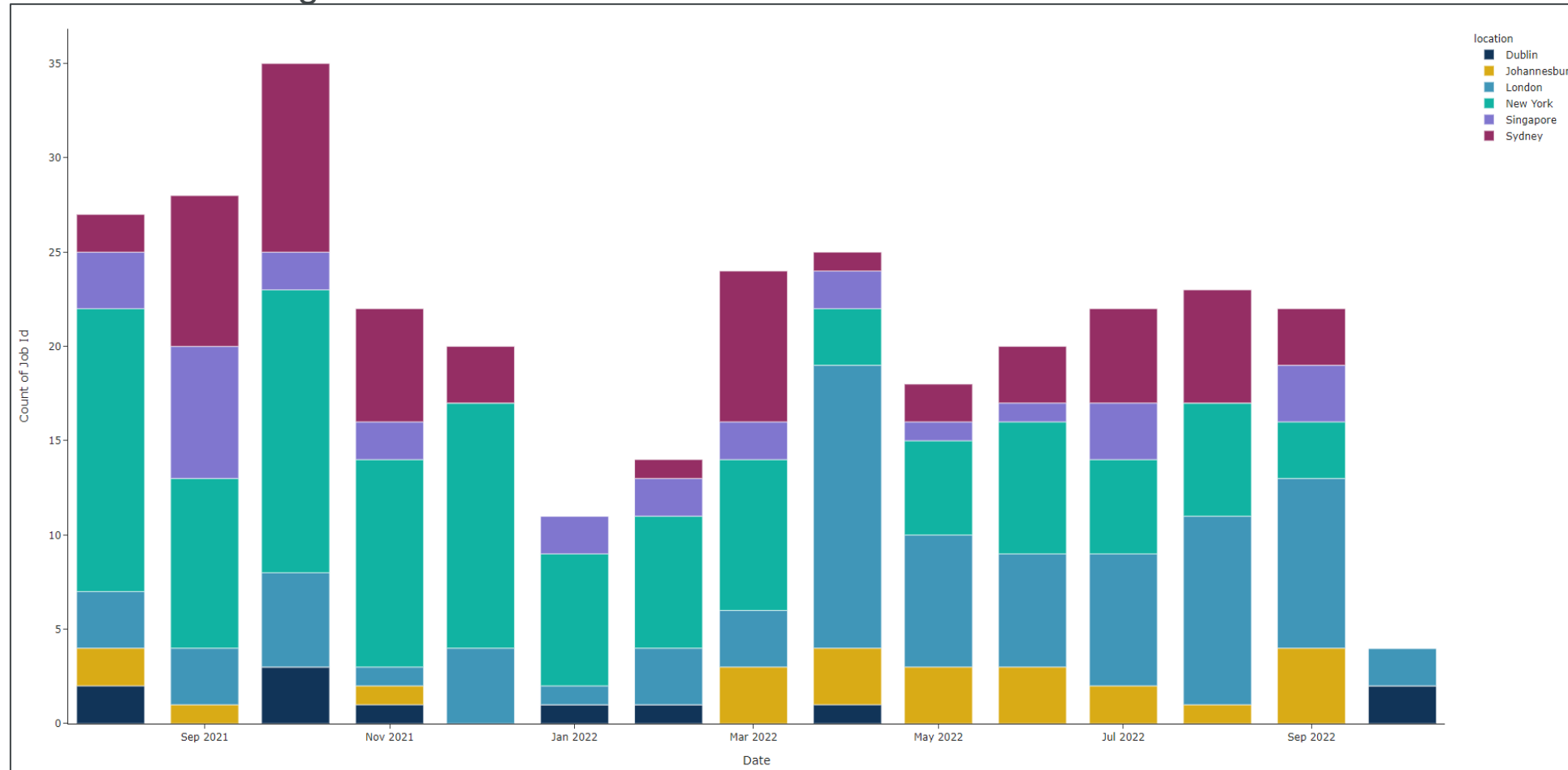
Demand per location:



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Exploring the data – Data Science

Machine Learning:



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Gender Decoding – Actuarial Job Ads

- Paper — <http://gender-decoder.katmatfield.com/static/documents/Gaucher-Friesen-Kay-JPSP-Gendered-Wording-in-Job-ads.pdf>

Masculine words	Feminine words
Active	Affectionate
Adventurous	Child*
Aggress*	Cheer*
Ambitio*	Commit*
→ Analy*	Communal
Assert*	Compassion*
Athlet*	Connect*
Autonom*	Considerate
Boast*	Cooperat*
Challeng*	Depend*

Sales Manager example:

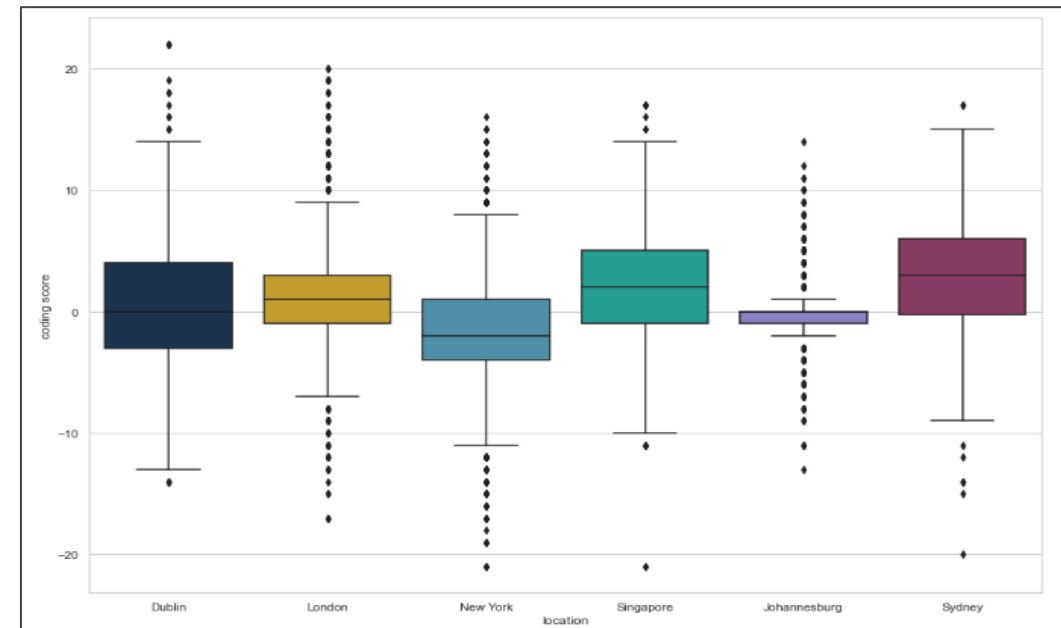
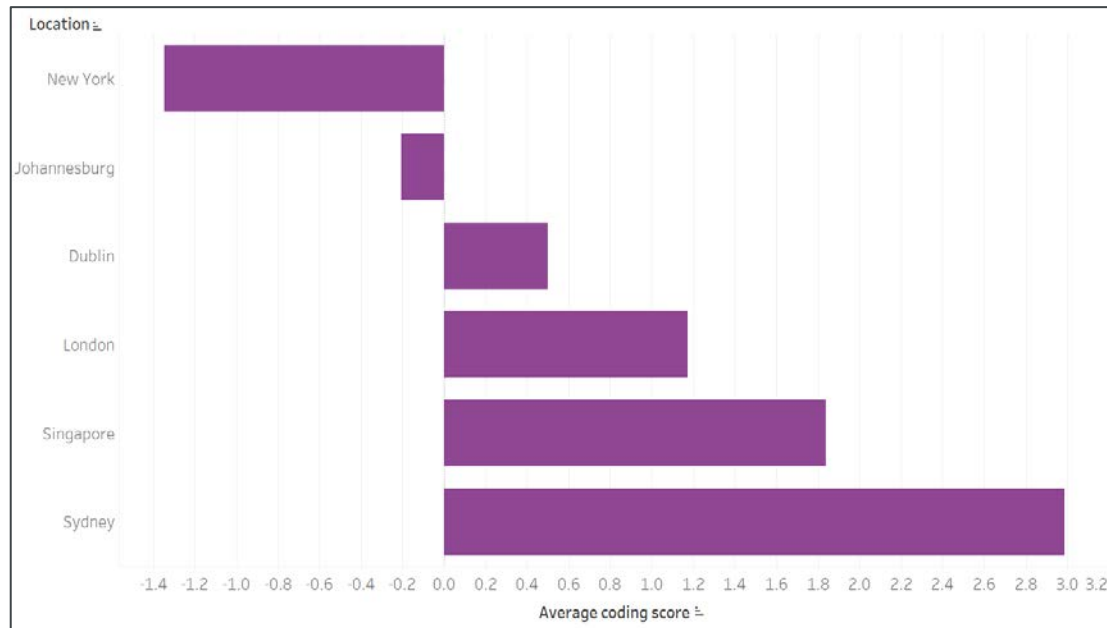
Feminine	Masculine
<p>Responsibilities</p> <ul style="list-style-type: none"> • Can motivate others to reach their potential as employees. • You will be the head of our fast-paced store, with further opportunities for career development. • You'll develop interpersonal skills and understanding of business. • Be a role model for your store, representing our exclusive brand. 	<p>Responsibilities</p> <ul style="list-style-type: none"> • Can challenge others to reach their potential as employees. • You will be the boss of our fast-paced store, with further opportunities career advancement. • You'll develop leadership skills and learn business principles. • Be a leader in your store, representing our exclusive brand.



Gender Decoding – Actuarial Job Ads

Gender code score = 'Female' words count – 'Male' words count

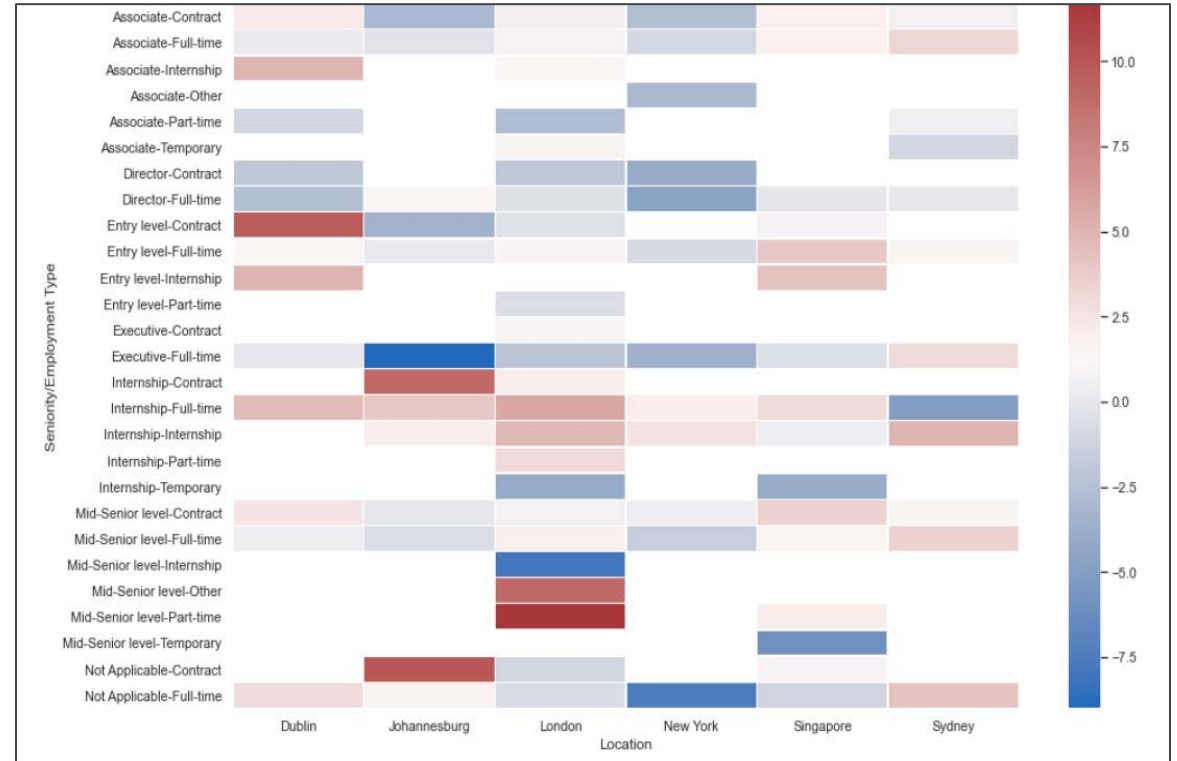
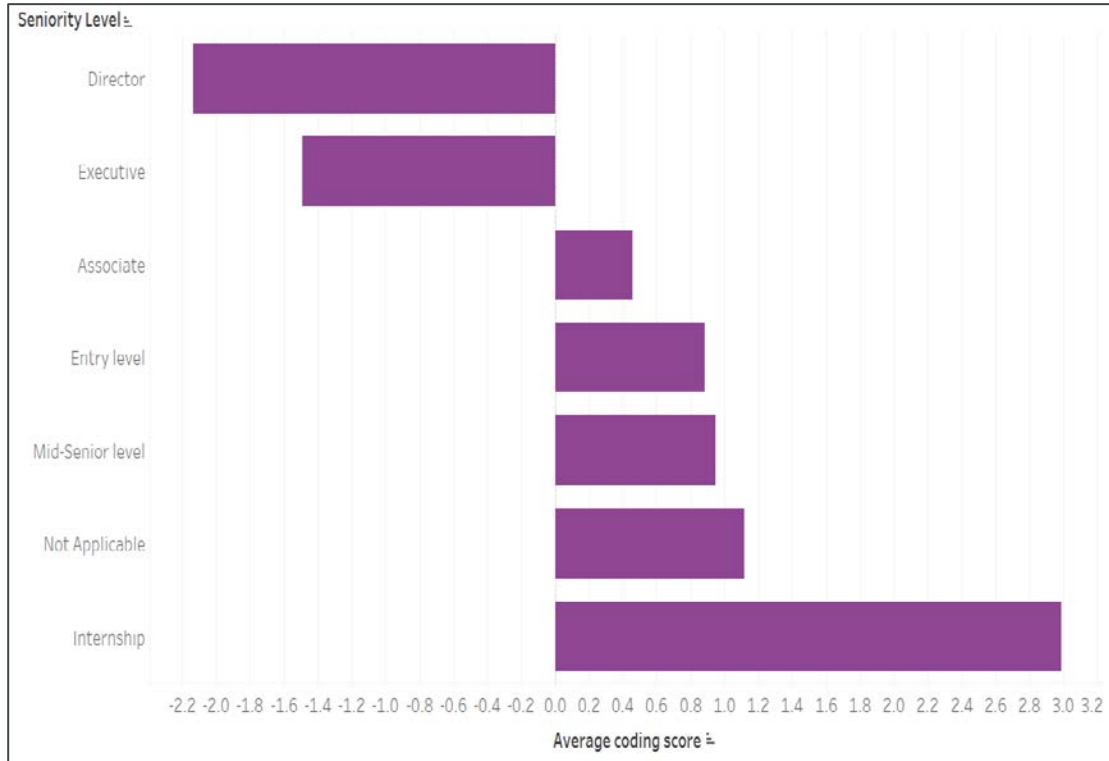
Code Result	Strongly masculine-coded	Masculine-coded	Neutral	Feminine-coded	Strongly feminine-coded
Code score	Less than -4	-1 to -3	0	1 to 3	4 and greater



- Test job ads yourself – <http://gender-decoder.katmatfield.com/>

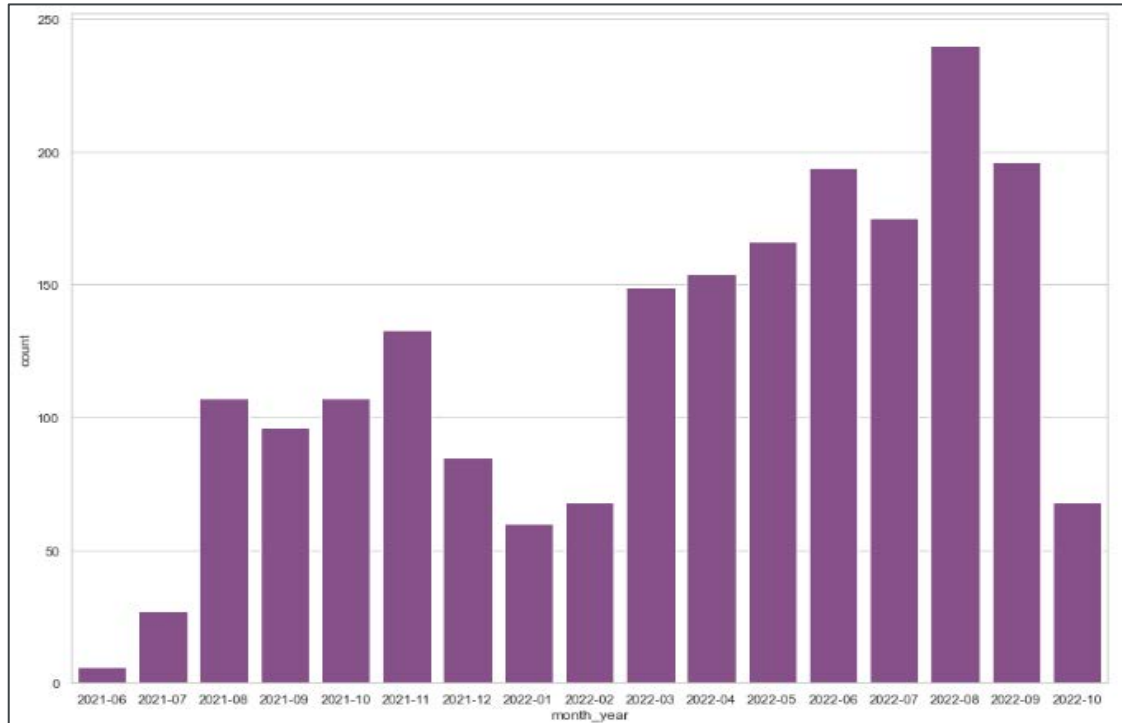


Gender Decoding – Actuarial Job Ads

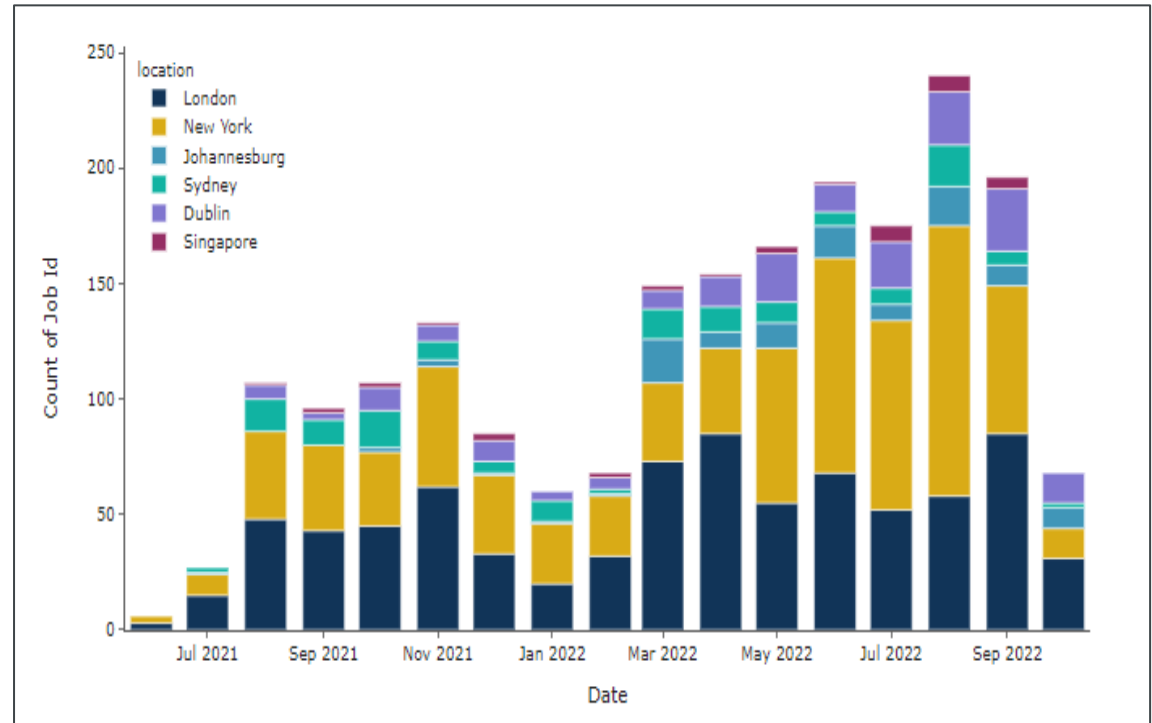


Exploring the Data – Hybrid/Remote opportunities

Hybrid/Remote/Work from home in job description:



Split by location:



Hybrid/Remote in job title:

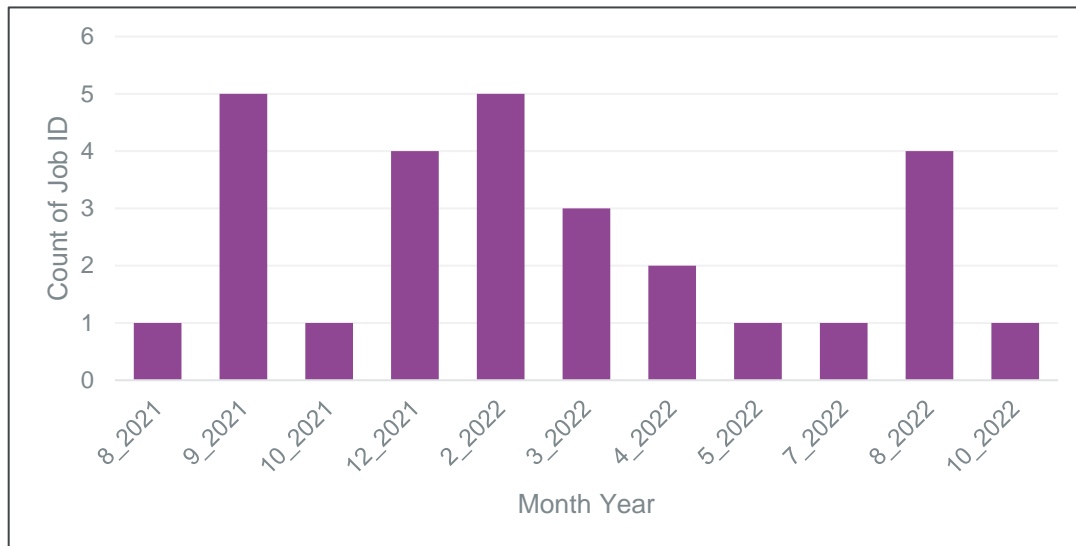
Location	Count of Job ID
New York	345
London	14
Dublin	6



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Exploring the Data – Climate opportunities

- Looked for job titles containing “Climate”, “ESG” or “Sustainable”
- **28** jobs, 85% of these in London
- PWC in New York had the first of our recorded positions in Aug 2021



```
climate actuary  
actuary  actuarial climate change  
esg gi actuary  
actuary - sustainable finance  esg  
actuarial services manager  climate risk modeling  climate scientist  
sustainable insurance actuarial consultant  
actuarial analyst: climate change and acf support  
actuarial climate change manager  
capital actuary  solvency ii  climate change  
executive manager reinsurance and climate strategy  
actuary  climate change  
esg consulting actuary
```

Job Description Fun Facts

 Date of most jobs posted: 12 April 2022 (107)

 Only 8% of jobs included salary ranges with London making up 63% of this

 Weekend/Evenings: 20 job ads

 Conflict: 35 job ads



Next Steps

- Clustering/Unsupervised learning of job ad descriptions
 - Evaluating an NLP Approach to Estimating KSA and Interest Job Analysis Ratings (Putka, Oswald et al)
- Further investigation of salary ranges
- Correlation with UK gender pay gap data available here:
<https://gender-pay-gap.service.gov.uk/viewing/download>
- Introduce European data sets
- Welcome further suggestions



Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.



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Thank you



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