

[https://github.com/IBMDveloperUK/
foss4g-geopandas](https://github.com/IBMDveloperUK/foss4g-geopandas)

1. go to the above link
2. download the repo

Agenda

14:00 Introduction + setting up

14:30 Pandas (notebook 1)

15:30 BREAK

15:45 GeoPandas (notebook 2)

16:45 BREAK

17:00 Pandas + GeoPandas (notebook 3)

18:00 End

Explore UK Crime Data with Pandas and GeoPandas

@MargrietGr

@yaminigrao

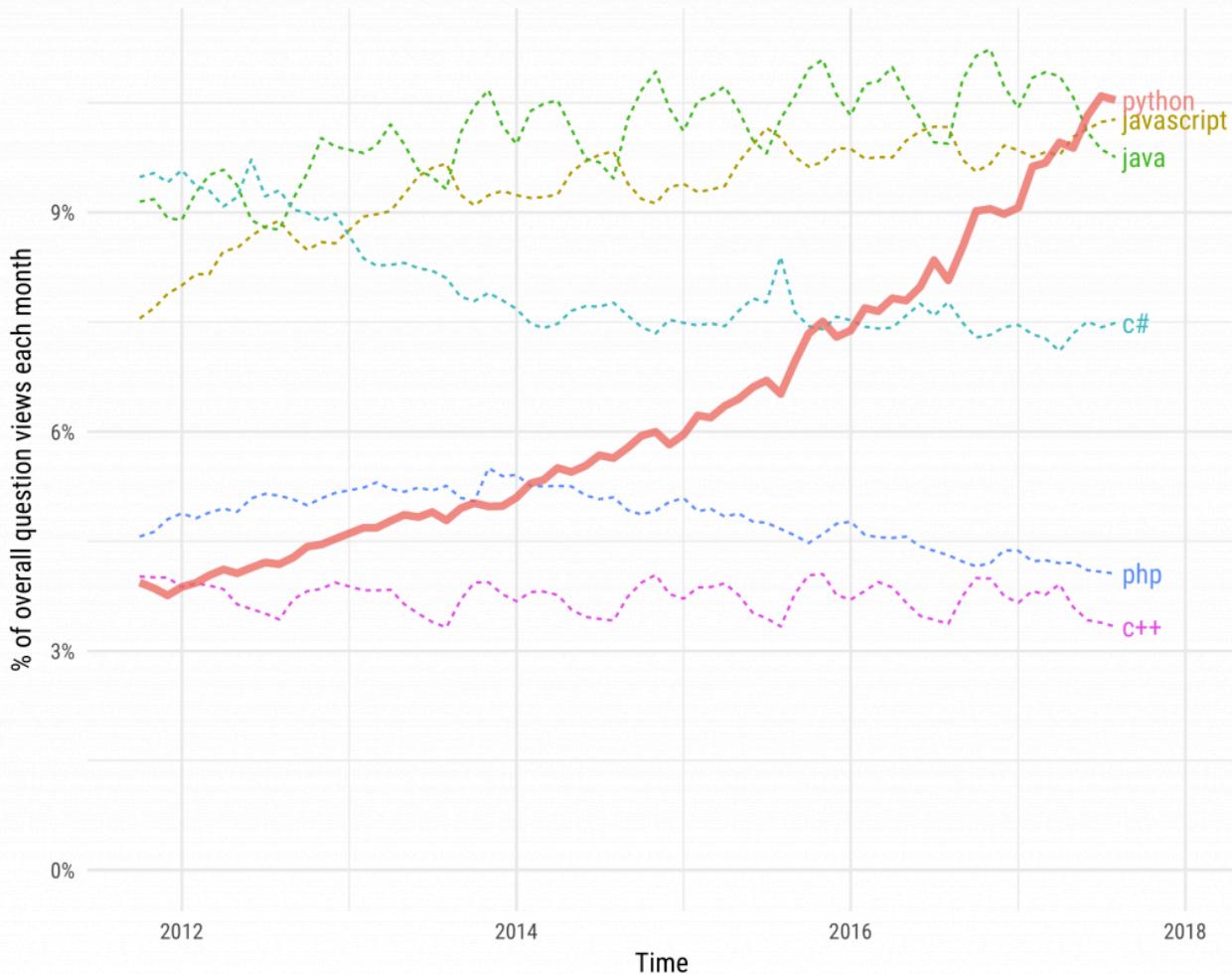
@IBMDeveloperUK

Python

<https://stackoverflow.blog/2017/09/06/incredible-growth-python/>

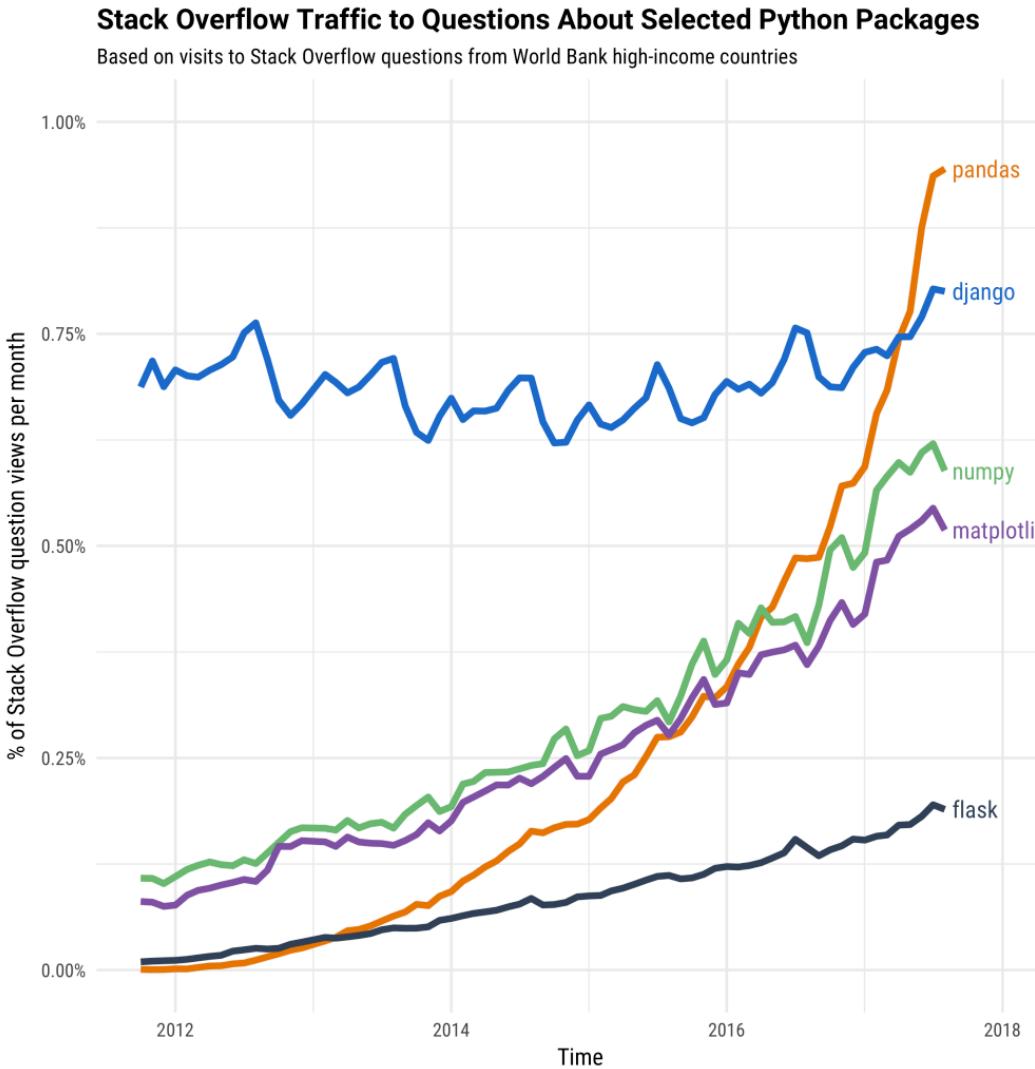
Growth of major programming languages

Based on Stack Overflow question views in World Bank high-income countries

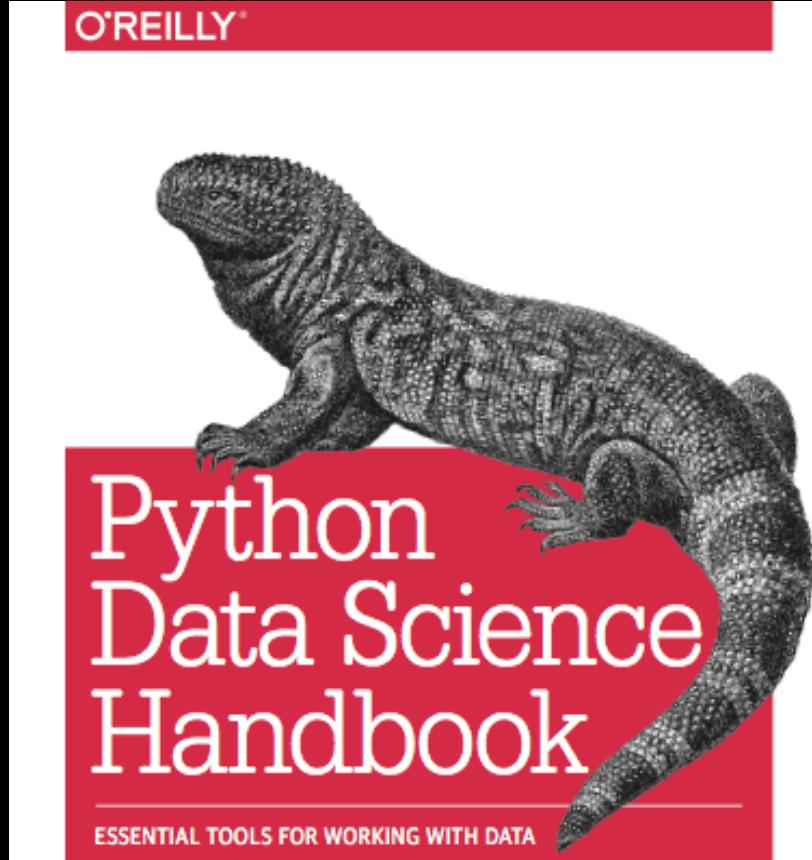


Pandas

<https://ourcodingclub.github.io/2018/04/18/pandas-python-intro.html>



<https://jakevdp.github.io/PythonDataScienceHandbook/>



powered by



Jake VanderPlas

Jupyter notebooks

Organize your:

Notes

Ideas

Python code

<http://jupyter.org/>

Install Python and Jupyter notebooks:

<https://www.anaconda.com/distribution/>

Or use the Cloud:

<https://dataplatform.cloud.ibm.com/>

The screenshot shows the IBM Watson Jupyter Notebook interface. At the top, there's a navigation bar with 'IBM Watson' and links for 'Projects', 'Tools', 'Catalog', 'Community', and 'Services'. Below that is a breadcrumb navigation: 'My Projects / PixelDust-Zurich-2018 / part-1-analyze-customer-data'. The main area has a toolbar with icons for File, Edit, View, Insert, Cell, Kernel, Help, Run, and Format. A dropdown menu is open over 'Format', showing 'Markdown' as the selected option. The notebook content starts with a section titled 'Load data into the notebook' containing a note about the data file. Below it is a code cell starting with 'In []:' followed by a URL to download a CSV file. There's also a link to 'Back to Table of Contents'. The next section is 'Part 1. Explore customer demographics' with a note about preparing the data. A code cell follows, starting with '# Extract the customer information from the data set' and listing various columns like CUSTNAME, ADDRESS1, CITY, etc. The bottom right corner of the slide has the number '7'.

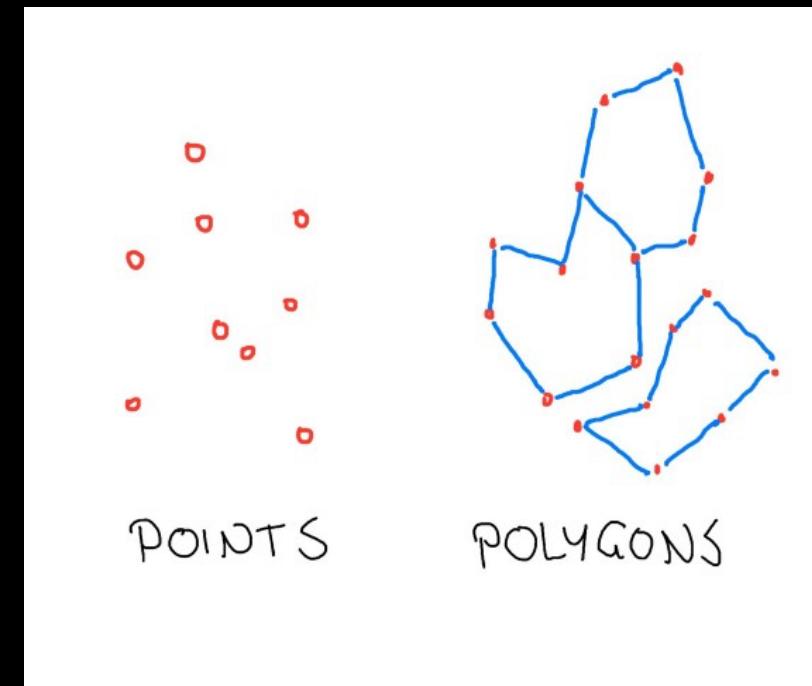
```
In [ ]: raw_df = pixiedust.sampleData('https://raw.githubusercontent.com/IBMCodLondon/localcart-workshop/master/data/customers_orders1_cpt.csv')

# Extract the customer information from the data set
# CUSTNAME: string, GenderCode: string, ADDRESS1: string, CITY: string, STATE: string, COUNTRY_CODE: string, POSTAL_CODE: string, POSTAL_CODE_PLUS4: string
customer_df = raw_df.select("CUST_ID",
                            "CUSTNAME",
                            "ADDRESS1",
                            "ADDRESS2",
                            "CITY",
                            "POSTAL_CODE",
                            "POSTAL_CODE_PLUS4",
                            "STATE",
                            "COUNTRY_CODE",
                            "EMAIL_ADDRESS",
                            "PHONE_NUMBER",
                            "AGE",
                            "GenderCode",
                            "GENERATION",
                            "NATIONALITY",
                            "NATIONAL_ID",
```

Pandas



GeoPandas



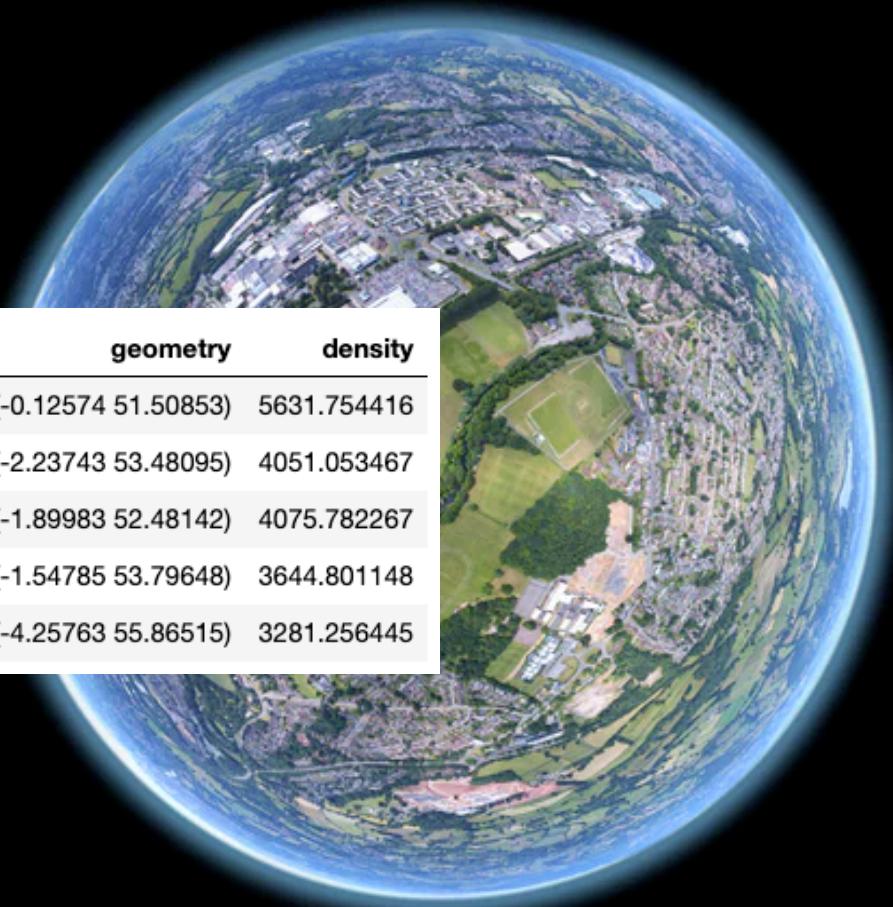
Pandas

	A	B	C	D	E	F
0	1.0	2013-01-02	1.0	3	test	foo
1	1.0	2013-01-02	1.0	3	train	foo
2	1.0	2013-01-02	1.0	3	test	foo
3	1.0	2013-01-02	1.0	3	train	foo



GeoPandas

	city	population	area	latitude	longitude	geometry	density
0	London	9787426	1737.9	51.50853	-0.12574	POINT (-0.12574 51.50853)	5631.754416
1	Manchester	2553379	630.3	53.48095	-2.23743	POINT (-2.23743 53.48095)	4051.053467
2	Birmingham	2440986	598.9	52.48142	-1.89983	POINT (-1.89983 52.48142)	4075.782267
3	Leeds	1777934	487.8	53.79648	-1.54785	POINT (-1.54785 53.79648)	3644.801148
4	Glasgow	1209143	368.5	55.86515	-4.25763	POINT (-4.25763 55.86515)	3281.256445







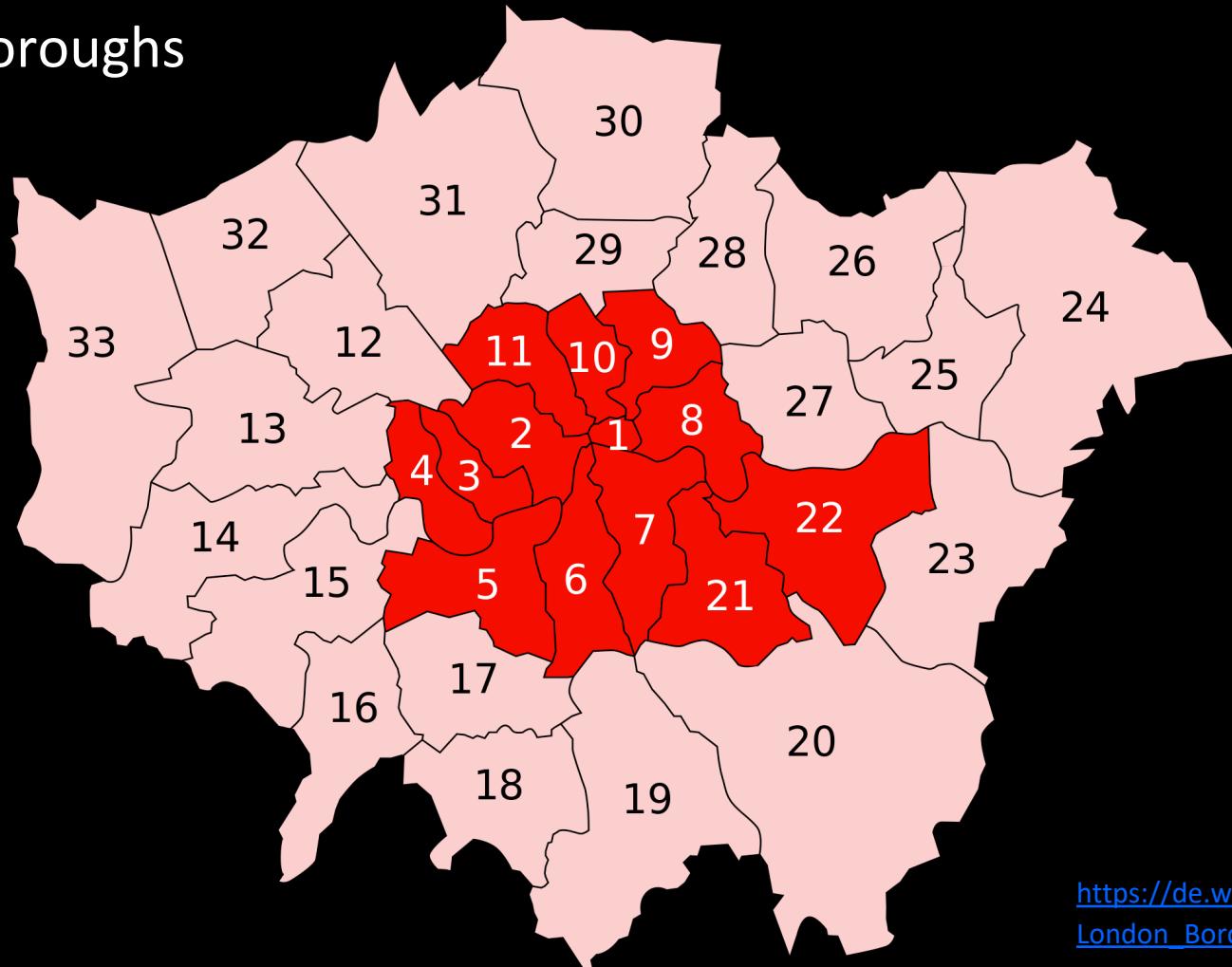
SAS

ZIP system

30 YEAR SYSTEM
UNITED WARRANTY

PROMISE
Advant

London Boroughs

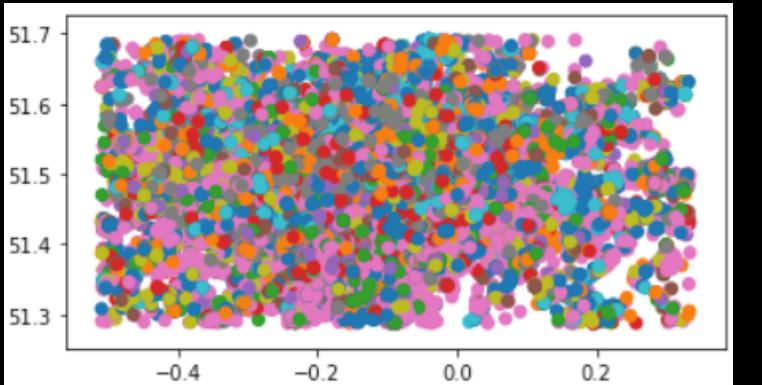


[https://de.wikipedia.org/wiki/
London_Borough](https://de.wikipedia.org/wiki/London_Borough)

london-borough-profiles.csv

```
[ 'Code',
  'Area_name',
  'Inner/_Outer_London',
  'GLA_Population_Estimate_2017',
  'GLA_Household_Estimate_2017',
  'Inland_Area_(Hectares)',
  'Population_density_(per_hectare)_2017',
  'Average_Age,_2017',
  'Proportion_of_population_aged_0-15,_2015',
  'Proportion_of_population_of_working-age,_2015',
  'Proportion_of_population_aged_65_and_over,_2015',
  'Net_internal_migration_(2015)',
  'Net_international_migration_(2015)',
  'Net_natural_change_(2015)',
  '%_of_resident_population_born_abroad_(2015)',
  'Largest_migrant_population_by_country_of_birth_(2011)',
  '%_of_largest_migrant_population_(2011)',
  'Second_largest_migrant_population_by_country_of_birth_(2011)',
  '%_of_second_largest_migrant_population_(2011)',
  'Third_largest_migrant_population_by_country_of_birth_(2011)',
  '%_of_third_largest_migrant_population_(2011)',
  '%_of_population_from_BAME_groups_(2016)',
  '%_people_aged_3+_whose_main_language_is_not_English_(2011_Census)',
  'Overseas_nationals_entering_the_UK_(NINO),_(2015/16)',
  'New_migrant_(NINO)_rates,_(2015/16)',
  'Largest_migrant_population_arrived_during_2015/16',
  'Second_largest_migrant_population_arrived_during_2015/16',
  'Third_largest_migrant_population_arrived_during_2015/16',
  'Employment_rate_(%)_2015',
  'Male_employment_rate_(2015)',
  'Female_employment_rate_(2015)',
  'Unemployment_rate_(2015)',
  'Youth_Unemployment_(claimant)_rate_18-24_(Dec-15)',
  'Proportion_of_16-18_year olds_who_are_NEET_(%)_2014',
  'Proportion_of_the_working-age_population_who_claim_out-of-work_benefits_(%)_(May-2016)',  
]
```

Open Street Map Data - Points of Interest (POIs)



```
['pub', 'bicycle_rental', 'park', 'restaurant', 'post_box',
 'post_office', 'library', 'memorial', 'telephone',
 'public_building', 'fountain', 'artwork', 'museum', 'poli',
 'toilet', 'cafe', 'pitch', 'recycling', 'bar', 'attractio',
 'swimming_pool', 'kindergarten', 'cinema', 'waste_basket',
 'monument', 'college', 'university', 'supermarket', 'grav',
 'hotel', 'laundry', 'courthouse', 'school', 'sports_centr',
 'pharmacy', 'convenience', 'bank', 'beverages', 'fast_foo',
 'fire_station', 'water_tower', 'doctors', 'department_sto',
 'theatre', 'viewpoint', 'playground', 'newsagent', 'gift_',
 'clothes', 'recycling_paper', 'veterinary', 'wastewater_p',
 'dentist', 'recycling_glass', 'chemist', 'hospital', 'tow',
 'tourist_info', 'bicycle_shop', 'car_rental', 'bakery',
 'travel_agent', 'doityourself', 'windmill', 'comms_tower',
 'car_sharing', 'camera_surveillance', 'garden_centre', 't',
 'recycling_clothes', 'ruins', 'nursing_home', 'embassy',
 'community_centre', 'computer_shop', 'water_works', 'arts',
 'butcher', 'car_dealership', 'nightclub', 'archaeological',
 'castle', 'bookshop', 'hairdresser', 'car_wash', 'vending',
 'drinking_water', 'prison', 'greengrocer', 'beauty_shop',
 'stationery', 'bench', 'florist', 'optician', 'motel',
 'mobile_phone_shop', 'kiosk', 'hostel', 'guesthouse',
 'picnic_site', 'outdoor_shop', 'furniture_shop', 'jewelle',
 'toy_shop', 'shoe_shop', 'video_shop', 'golf_course',
 'sports_shop', 'camp_site', 'shelter', 'wayside_shrine',
 'zoo', 'vending_parking', 'bed_and_breakfast', 'theme_par',
 'observation_tower', 'caravan_site', 'hunting_stand',
 'vending_machine', 'water_well', 'lighthouse', 'battlefiel
```

Welcome to data.police.uk

This is the site for open data about crime and policing in England, Wales and Northern Ireland.

You can download [street-level crime, outcome, and stop and search data](#) in clear and simple CSV format and explore the [API](#) containing detailed crime data and information about individual police forces and neighbourhood teams.

You can also download data on police activity, and a range of data collected under the [police annual data requirement \(ADR\)](#) including arrests and 101 call handling.

All the data on this site is made available under the [Open Government Licence v3.0](#).



DOWNLOADS

[Download Police.uk data in batches](#)



API DOCS

[Access Police.uk data via an API](#)



CHANGELOG

[See what's new, see what's coming soon](#)

UK Crime Data – metropolitan

Monthly csv files read a saved as annual files

Street.csv

Unnamed: 0	Crime ID	Month	Longitude	Latitude	Location	LSOA code	Crime type	Last outcome category	Context	
0	0	NaN	2018-01	0.136387	51.589215	On or near Billet Road	E01000027	Anti-social behaviour	NaN	NaN
1	1	NaN	2018-01	0.140634	51.583427	On or near Rams Grove	E01000027	Anti-social behaviour	NaN	NaN
2	2	NaN	2018-01	0.140192	51.582311	On or near Hatch Grove	E01000027	Anti-social behaviour	NaN	NaN
3	3	NaN	2018-01	0.137065	51.583672	On or near Police Station	E01000027	Anti-social behaviour	NaN	NaN
4	4	NaN	2018-01	0.137065	51.583672	On or near Police Station	E01000027	Anti-social behaviour	NaN	NaN

UK Crime Data – metropolitan

Monthly csv files read a saved as annual files

Stop-and-search.csv

Unnamed: 0	Type	Date	Part of a policing operation	Policing operation	Latitude	Longitude	Gender	Age range	Legislation	Object of search	Outcome	Outcome linked to object of search
0	0	Person search 2018-01-01T00:05:00+00:00	False	NaN	51.425491	-0.220473	Male	18-24	Misuse of Drugs Act 1971 (section 23)	Controlled drugs	Khat or Cannabis warning	NaN
1	1	Person search 2018-01-01T00:15:00+00:00	False	NaN	51.459996	-0.116896	Male	over 34	Misuse of Drugs Act 1971 (section 23)	Controlled drugs	Arrest	NaN
2	2	Person and Vehicle search 2018-01-01T00:16:00+00:00	False	NaN	51.542049	-0.380529	Male	25-34	Misuse of Drugs Act 1971 (section 23)	Controlled drugs	A no further action disposal	NaN
3	3	Person and Vehicle search 2018-01-01T00:17:00+00:00	False	NaN	51.613286	-0.065711	Male	25-34	Misuse of Drugs Act 1971 (section 23)	Controlled drugs	Arrest	NaN
4	4	Person search 2018-01-01T00:20:00+00:00	False	NaN	51.461004	-0.115876	Male	over 34	Misuse of Drugs Act 1971 (section	Controlled drugs	A no further action	NaN

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To do:

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