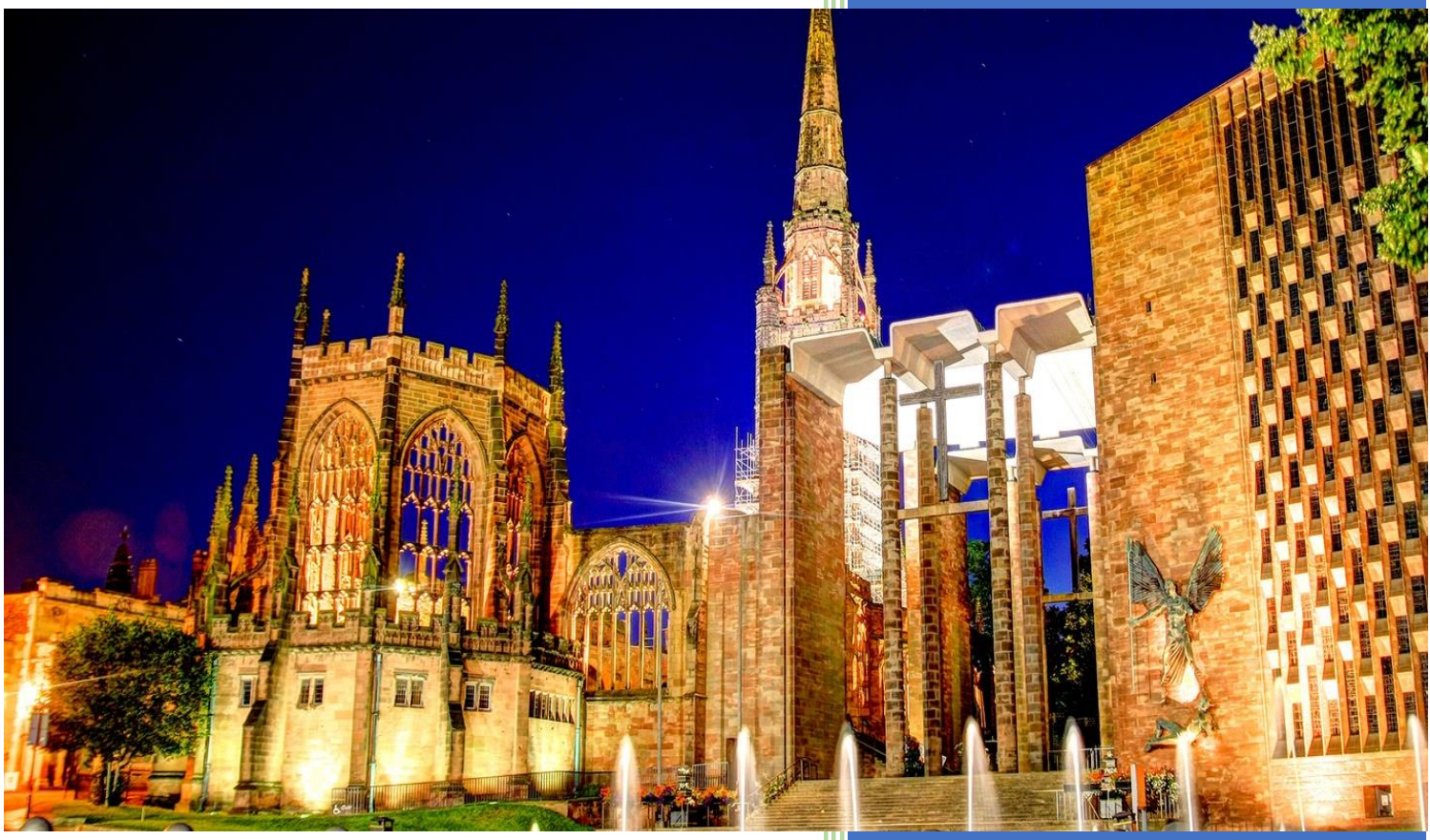
The battle of Neighbourhood – Coventry: Business and Data



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1. A brief introduction to Coventry

1.1 Business problem

For many people when they hear Coventry, their minds immediately serve them Lady Godiva's story, if you are not one of them and you are not familiar with the city of Coventry or lady Godiva, stick around, as today, we are going to learn a bit about the 9th largest city in England and 11th largest in the United Kingdom as per 2011 census when its population reached 316,915.

Coventry is located in the West Midlands, it is also the most central city in England, in other words, it is far from the sea in every direction. Coventry is well known for the legendary 11th century exploits of Lady Godiva who rode through the city naked on horseback in protest at high taxes being levied on the city folk by her husband Leofric, Earl of Mercia. The residents of the city were commanded to look away as she rode, but one man did not and was allegedly struck blind. He became known as Peeping Tom thus originating a new idiom, or metonym, in English. There is a Grade II listed statue of her in the city centre.

On several occasions Coventry was briefly the capital of England. One of those occasions was in 1404, when Henry IV summoned a parliament in Coventry as he needed money to fight rebellion, which wealthy cities such as Coventry lent to him, while both Henry V and VI frequently sought loans from the city to meet the expense of the war with France.

City of Coventry, where the author lives, attracts a large number of tourists, not least due to its famous cathedral that was destroyed in the world war II, it is also as a home to the following 13 museums and galleries,

- Charterhouse Coventry
- Coventry Transport Museum
- Coventry Watch Museum
- Herbert Art Gallery and Museum
- Lunt Roman Fort
- Midland Air Museum
- Coventry Cathedral
- Coventry Police Museum
- Revival Cars
- 2-Tone Village Coventry
- St Mary's Guildhall
- The Coventry Music Museum
- The Weaver's House

In 2017, the city of Coventry won the title of UK City of Culture 2021, which means more tourists will visit.

Finding the right place to eat can be a challenge, due to different tastes, health, religious, cultural, and moral reasons. hence, the purpose of this exercise is to give a simple recommendation to tourists in Coventry: for example, where to each thai or middle eastern food, where to get fast food? Etc

1.2 Target audience:

Tourists visiting Coventry who would want to know what type of restaurants are available and where to eat

A business entrepreneur that wants open a new restaurant in Coventry.

Business Analyst or Data Scientists, who wish to analyse the neighbourhoods of Coventry using python, Jupyter notebook and some machine learning techniques.

Someone curious about data that want to have an idea, how beneficial it is to open a restaurant and what are the pros and cons of this business.

2. Data section

It is requested by the assignment to use Foursquare API, in this report I will use foursquare data to find restaurants in Coventry.

- To start and in Wikipedia, I found the list of postcodes for the City of Coventry and its surrounding areas, this will help segment the area.
  https://en.wikipedia.org/wiki/CV_postcode_area
- Many areas around the city use the postcode starting CV, however, in this study I will focus on the areas (I called boroughs for lack of better terms) that are under the Coventry Council authority

Coverage [edit]

The approximate coverage of the postcode districts:

Postcode district	Post town	Coverage	Local authority area(s)
CV1	COVENTRY	Coventry C (Coventry City Centre, Gosford Green, Hillfields, Spon End, Coventry University)	Coventry
CV2	COVENTRY	Coventry NE (Walsgrave, Wyken, Stoke, Bell Green, Wood End, Potters Green, Aldermans Green, Clifford Park, Woodway Park)	Coventry
CV3	COVENTRY	Coventry SE (Binley, Whitley, Willenhall, Cheylesmore, Styvechale, Finham, Fenside, Stoke Aldermoor, Green Lane, Ernesford Grange, Binley Woods)	Coventry, Rugby
CV4	COVENTRY	Coventry SW (Tile Hill, Canley, Cannon Park, Lime Tree Park, Gibbet Hill, Westwood Heath, University of Warwick)	Coventry
		Coventry NW (Allesley, Allesley Park, Allesley Green,	

As can been seen above, the areas (neighbourhoods) are segregated by postcodes, this will limit our project and may affect our results, because we need a bit of detailed per neighbourhood data.

Using Beautiful Soup library, I pulled the data into Jupyeter notebooks,

Out[53]:

	postcode	Post town	Coverage	Local authority area(s)
0	CV1	COVENTRY	Coventry C (Coventry City Centre, Gosford Gree...	Coventry
1	CV2	COVENTRY	Coventry NE (Walsgrave, Wyken, Stoke, Bell Gre...	Coventry
2	CV3	COVENTRY	Coventry SE (Binley, Whitley, Willenhall, Chey...	Coventry, Rugby
3	CV4	COVENTRY	Coventry SW (Tile Hill, Canley, Cannon Park, L...	Coventry
4	CV5	COVENTRY	Coventry NW (Allesley, Allesley Park, Allesley...	Coventry
5	CV6	COVENTRY	Coventry N (Holbrooks, Coundon, Radford, Longf...	Coventry, Nuneaton and Bedworth
6	CV7	COVENTRY	Exhall, Ash Green, Keresley, Meriden, Balsall ...	Nuneaton and Bedworth, North Warwickshire, Cov...
7	CV8	COVENTRY	Wolston, Ryton-on-Dunsmore	Warwick, Rugby
8	CV8	KENILWORTH	Kenilworth, Baginton, Bubbenhall, Burton Green...	Warwick, Rugby
9	CV9	ATHERSTONE	Atherstone, Mancetter, Grendon, Baddesley Enso...	North Warwickshire, Hinckley and Bosworth
10	CV10	NUNEATON	Nuneaton N & W (Weddington, Stockingford, Camp...	Nuneaton and Bedworth, North Warwickshire
11	CV11	NUNEATON	Nuneaton C & E (town centre, Abbey Green, St N...	Nuneaton and Bedworth, Rugby, Hinckley and Bos...
12	CV12	BEDWORTH	Bedworth (except Exhall and Ash Green), Bulkin...	Nuneaton and Bedworth
13	CV13	NUNEATON	Barlestone, Barton in the Beans, Bilstone, Cad...	Hinckley and Bosworth
14	CV21	RUGBY	Rugby (north), Brownsover	Rugby
15	CV22	RUGBY	Rugby (south), Bilton, Cawston, Dunchurch	Rugby
16	CV23	RUGBY	Thurlaston, Princethorpe, Stretton-on-Dunsmore...	Rugby, West Northamptonshire
17	CV31	LEAMINGTON SPA	Leamington Spa (south), Sydenham, Whitnash, Ra...	Warwick
18	CV32	LEAMINGTON SPA	Leamington Spa (north), Cubbington, Lillington	Warwick
19	CV33	LEAMINGTON SPA	Harbury and surrounding villages	Warwick, Stratford-on-Avon
20	CV34	WARWICK	Warwick	Warwick

After few steps in wrangling this data, it seems that it will not yield what we need, as it clustered the neighbourhoods by a postcode, which will cause us two issues:

1) We will have to do more work in separating the coverage into neighbourhoods
2) We will have to find a post code for each area within the areas provided

Since this data was lacking, I started looking elsewhere, luckily I found UK-GeoJSON API and website that will not only give me the breakdown of Coventry areas but it also has the latitude and longitude as well as geometry, but the postcodes are missing.

In [328]:
```
#load the file from https://martinjc.github.io/UK-GeoJSON/
coventry_neighborhood_geodf = gpd.read_file('coventry_boundaries.geojson')
coventry_neighborhood_geodf.head()
```

Out[328]:

	id	WD13CD	WD13CDO	WD13NM	WD13NMW	geometry
0	E05001218	E05001218	00CQFU	Bablake	None	POLYGON ((-1.52929 52.41871, -1.53465 52.42134...
1	E05001219	E05001219	00CQFW	Binley and Willenhall	None	POLYGON ((-1.46293 52.37639, -1.46539 52.37802...
2	E05001220	E05001220	00CQFX	Cheylesmore	None	POLYGON ((-1.50450 52.37779, -1.50448 52.37812...
3	E05001221	E05001221	00CQFY	Earlsdon	None	POLYGON ((-1.50938 52.37876, -1.51609 52.37982...
4	E05001222	E05001222	00CQFZ	Foleshill	None	POLYGON ((-1.50921 52.41305, -1.50951 52.41563...

After cleaning the above data, we are left with 3 columns, neighbourhoods, latitude and longitude.

	Neighborhood	Latitude	Longitude
0	Bablake	52.439341	-1.565273
1	Binley And Willenhall	52.391733	-1.457056
2	Cheylesmore	52.387161	-1.492103
3	Earlsdon	52.393886	-1.531970
4	Foleshill	52.428311	-1.497469
5	Henley	52.433886	-1.449003
6	Holbrook	52.443502	-1.513496
7	Longford	52.446222	-1.478762
8	Lower Stoke	52.404403	-1.473717
9	Radford	52.424336	-1.517428
10	St Michael'S	52.407433	-1.501943

My next step, I used an API call MapIt UK and I created a function to loop through the neighbourhood ids and provide the postcodes, once that the data was ready I merged it with the latest dataframe.

I loaded the file in a dataframe and merged it with the first dataframe,

]:

	Neighbourhoods	Latitude	Longitude	Neighbourhoods ids	postcodes
0	Bablake	52.439341	-1.565273	8907	CV6 2AG
1	Cheylesmore	52.387161	-1.492103	8910	CV3 4AH
2	Earlsdon	52.393886	-1.531970	8909	CV3 5AZ
3	Foleshill	52.428311	-1.497469	8914	CV1 4NZ
4	Henley	52.433886	-1.449003	8905	CV2 1EN
5	Holbrook	52.443502	-1.513496	8922	CV6 6HX
6	Longford	52.446222	-1.478762	8921	CV2 1NW
7	Lower Stoke	52.404403	-1.473717	8918	CV2 5FR
8	Radford	52.424336	-1.517428	8917	CV6 1DT
9	Sherbourne	52.416080	-1.535556	8916	CV6 1GH
10	Upper Stoke	52.420333	-1.477083	8920	CV2 3EH
11	Wainbody	52.379894	-1.542019	8908	CV3 6DS
12	Westwood	52.396166	-1.579312	8906	CV4 8BP
13	Whoberley	52.410833	-1.549512	8913	CV5 8GD
14	Woodlands	52.412161	-1.583586	8912	CV4 9TN
15	Wyken	52.412569	-1.448599	8919	CV2 2NB

We now have a dataframe with areas names, latitude, longitude ad postcodes and ready to use the Foursquare API