LA 558

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GOOGLE PLUS CODES

1.1 Introduction

Plus codes also known as Open Location Codes refer to a geocode system used for identifying and locating places. It was first developed by Google in 2014. Plus codes serve as a means of encoding location into a form that is easier to use than showing coordinates in the usual form of a latitude and longitude. In other words, they are designed to be used like street addresses, and may especially be useful in places where there is no formal system to identify buildings, such as street names, house numbers, and post codes.

It is estimated that about half of the world's population live in urban areas and that about 40 percent of these urban dwellers live in areas with unnamed streets and house numbers (Farvacque-Vitkovic et al, 2005). Thus, the development of plus codes can be considered as an alternative remedy to this problem and a step in the right direction.

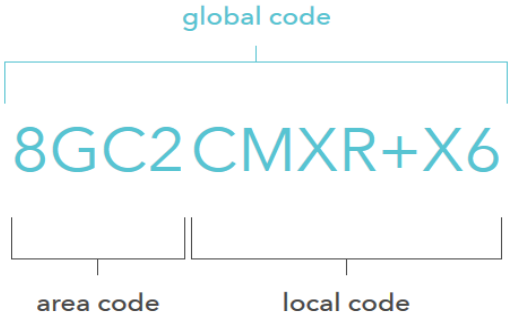
1.2 How it works

The system uses alphanumeric codes and is based on latitudes and longitudes in WGS 84 coordinates. However, the codes represent an area rather than points. A plus code has 10 characters and is composed of the following;

- An area code which is made up of the first four letters. This describes a region of 100 x 100 kilometers; and
- A local code which consists of the last six characters. This describes an area of 14 x 14 meters mostly neighborhoods and buildings.

One does not need to use the first four digits of a plus code when searching for an international location or a place that is far from the search location. The local code in such cases is combined with the nearest city or town to make it simpler. For instance, if the search location is New York, the local code can be used together with the name of the city.

On Google maps, one can use plus codes in two ways. This entails searching for a plus code of a place and searching for a place with a plus code. The feature is also available for android and iOS devices.



1.3 Working with Plus Code API

Just like other similar geocoding applications, plus codes require an Applications Programming Interface (API) in order to function. The API first of all, converts the location (latitude/longitude or address) to a plus code. Additionally, it uses Google's locality information to generate short codes and addresses. The results are provided in JSON format and is modeled on the Google Geocoding API.

1.3.1 API Format

A Plus codes API request takes the following form:
https://plus.codes/api?parameters

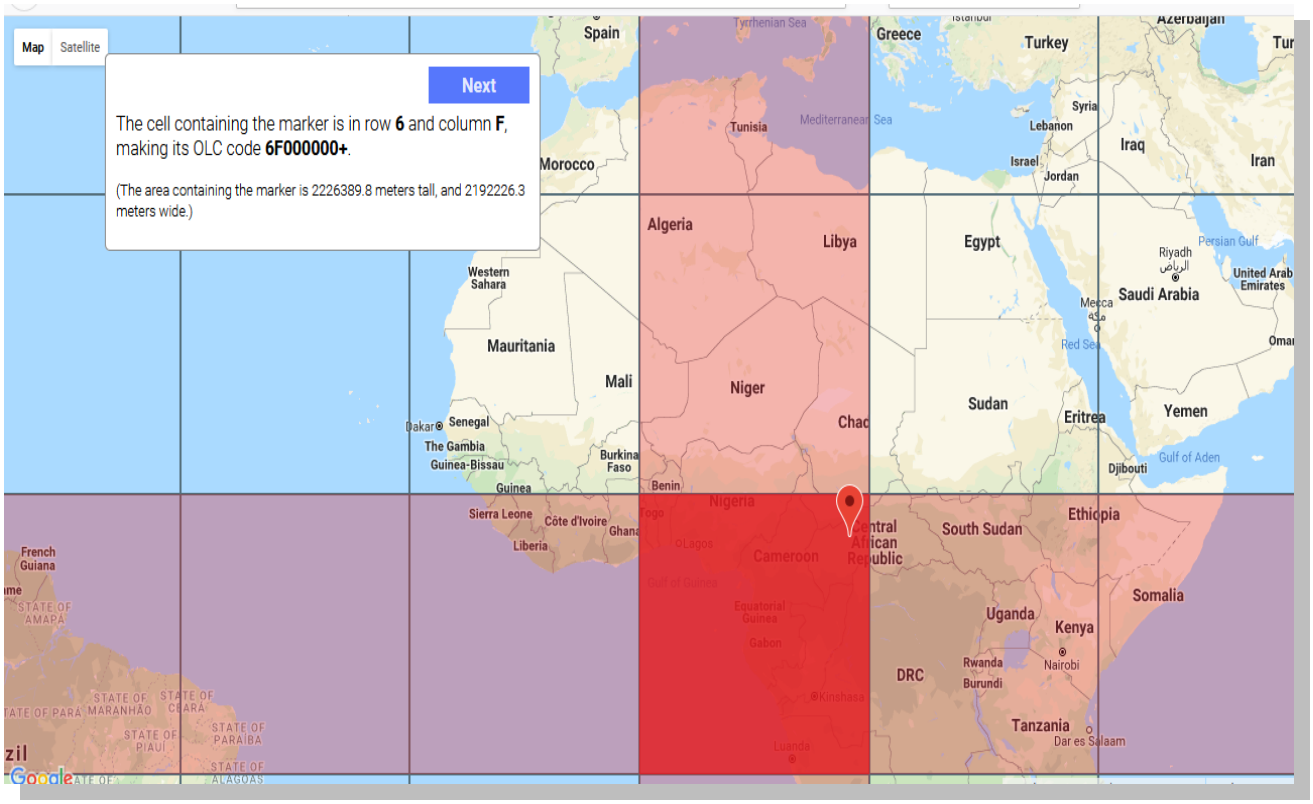
a. Required parameter:

- Address — the address to encode. This can be any of the following (if the ekey parameter is also provided):
  - A latitude/longitude
  - A street address
  - A global code
  - A local code and locality
  - A local code and latitude/longitude

b. Recommended parameters:

A Google API key is required. If this parameter is omitted, only latitude/longitude and global codes can be used in the address parameter, and locality information will not be returned. Also an email address of the user is required as well as the language in which results are returned. This does not affect the global code, but it will affect the names of any features generated, as well as the address used for the local code.

A Map Showing Plus Codes created using Google Map API



1.4 Benefits of Plus Codes

With nearly half of the world's population living on unnamed streets, it is believed that the use of plus codes constitute a major impact towards effective urban management especially in the areas where they are needed the most. An essential aspect of this means of identification is that it is free to acquire, reliable, and an easy way to share addresses. The system does not require an active internet connection to function. In addition, plus codes are not limited to computers and other electronic devices but can be printed on paper and used without the need for an electronic device.

Also, the codes are independent of political features including country boundaries. For instance, if a location changes country affiliation, all plus codes remain unchanged. Finally, for individuals and families, plus codes can be used in place of street addresses to ensure easy identification of people places and also enhance the provision of urban services.

1.5 Limitations and Recommendations

Plus codes have some limitations that are driven by usability compromises or the encoding methodology. The key ones are that, the code areas distort at high altitudes due to longitude convergence. However, the practical impact of this disadvantage is not significant due to the low populations at the North and South Pole, and the ability to use codes representing small areas to approximate point locations.

Also, for the system to be receive widespread adoption, it is generally believed that plus codes should be easy to use. In that, the codes must be short to be remembered and used by people. An important characteristic of an effective addressing system is that it should entail a form of interaction between people, the physical environment and its digital representation (Coetzee and Cooper, 2007) This implies that the codes need to be shorter than the latitude and longitude so that people may find it easy to use them.

More importantly, there should be flexible precision. Since plus codes do not focus on point locations but rather on an area, it is imperative to consider issues relating to precision. For example, the location of an apartment building may only need a precision of +/- 10 meters. But locating a smaller house may require a precision of only three to four meters. In effect, it is recommended that the codes should support a range of precisions for different locations.

1.6 Conclusion

In a nutshell, it can be said that plus codes provide a means of encoding location into a form that is easier to use when compared to latitudes and longitudes. This has the potential of facilitating the identification of people and places as well as the delivery of urban services especially in areas where there are no formal addressing systems.

References

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