# Data Anonymization using Big Data Frameworks

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Abstract-Privacy is the main issue that is faced in Big data especially which includes the sensitive data. When it comes for sharing or publishing of these data then the privacy breach is occurred to overcome this issue we are focusing on the anonymization of the data. There are two generally-embraced ways to overcome privacy breach they are Data Encryption and Anonymization. Our goal is to achieve zero tolerance security on a significant amount of data. This paper mainly speaks about the data anonymization using the bigdata frameworks and Cassandra database.

## Keywords-Anonymization, Bigdata, Privacy, Cassandra, Spark, Kafkha.

## **1.Introduction**

Big data has brought revolution in the world of data analytics. Data which was discarded few years ago is now considered to be a powerful asset[1]. This poses a very serious security concern. As big data contains individual specific information privacy is a major security concern. In the recent years because of increase in ability to store personal information regarding the user the problem of privacy-preservation has tend to become more important. There are number of anonymization techniques to perform privacy-preservation in data mining.

According to recent Forrester study, 80 percent of breaches in data security who put information at risk involve employees or those with internal access to an organization. The biggest challenge today for companies is to preserve data form such people. For example, database users are assigned a Database Administrator (DBA) role and are granted with different system privileges. To ensure the privacy and integrity of corporate information today many companies are using a much comprehensive security approach. A database having a huge dataset with high dimension data should be secure to maintain personal data private from the world. The most important concern today is to protect sensitive information from getting disclosed or misinterpreted [5]. There are two types of

**disclosures**- Identity Disclosure and Attribute Disclosure. Attribute Disclosure and Identity Disclosure. Attribute disclosure is the one in which crucial information is inferred regarding a person from published data. When an individual entity can be distinguished from the published data then it is Identity disclosure [2]. Data anonymization techniques enables publication of detailed information. In this study we focus on Rjindeal Algorithm as it is one of the best algorithm that can be used for the encryption of the data, here we are Encrypting the sensitive data that has been sent from one end to the other, so that the sensitive information won't be available and it can't be theft as well.

The Rijndael algorithm is a new generation symmetric method of encrypting text in which a cryptographic key and algorithm are applied to a block of data at once as a group rather than to one bit at a time.

Rijndael uses a variable number of rounds, depending on key/block sizes, as follows:

9 rounds if the key/block size is 128 bits

11 rounds if the key/block size is 192 bits

13 rounds if the key/block size is 256 bits

Rijndael is a substitution linear transformation code, not requiring a Feistel network. It use three dstrategict invertible uniform transformations. these three transforms are: Linear Mix Transform; Non-linear Transform and Key Addition Transform.

## 2. Data Analysis:

The dataset that we have used in this is an accident traffic data set. As the name of the dataset describes the type of the data set it is. As it is a very Huge Data Set, which will have a collection of the list of the accident that have been occurred. It is a structured dataset, in this dataset there are many columnar, where it described the details of the accidents that have been occurred, it also gives the description of the accident occurred. There is few sensitive information in this dataset like the driver license that must not be available for everyone, even the Driver Name, Casualty Name, Casualty License Number the car details of the both, here these Data Columns should be anonymized, where we are Encrypting the sensitive dataset using the appropriate algorithms.

| - 4 | A         | B        | c        | D E                  | F G                   | н           | 1             | 1              | ×          | 1        | M            | N         | 0             | P           | Q             | R          |
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| 3   | 108A0000  | 435011   | 436276   | 2 01-Jan-10          | 205 Unclassifie       | Wet / Dan   | Darkness:     | Fine witho 9   | assenger   | Slight   | Male         | 34        | 6 Goods veh   | icle 3.5 to | intes mgar ar | nd under   |
| 4   | 108A0000  | 430429   | 437764   | 1 01-Jan-10          | 124 Unclassifie       | Front/ Ice  | Darkness:     | Fine witho P   | Pedestrian | Slight   | Female       | 34        | 4 Goods veh   | icle 3.5 to | ones mgw ar   | tul unsler |
| 5   | 10BA0000  | 429002   | 436842   | 2 01-Jan-10          | 550 Unclessifie       | Wet / Dan   | Darkness:     | Fine witho 8   | Driver     | Slight   | Male         | . 23      | 7 Car         |             |               |            |
| 6   | 10CA0000  | 429399   | 433811   | 2 01-Jan-10          | 1825 A(M)             | Wet / Dan   | r Darkness:   | Fine witho I   | Orlver     | Slight   | Male         | 18        | B. Car        |             |               |            |
| 7   | 10CA0000  | 429399   | 433811   | 2 01-Jan-10          | 1825 A(M)             | Wet / Dan   | Darkhess:     | Fine witho P   | assenger   | slight   | Male         | 21        | D Car         |             |               |            |
| 8   | 10CA0000  | 429399   | 433811   | 2 01-ian-10          | 1825 A(M)             | Wet / Dan   | r Darkness:   | Fine witho P   | assenger   | Slight   | Female       | 2         | 1 Car         |             |               |            |
| 9   | 10CA0000  | 432367   | 427238   | 1 01-Jan-10          | 1715 A                | Wet / Dan   | Darkness:     | Fine witho E   | driver     | Slight.  | Maio         | 11        | 9.Car         |             |               |            |
| 10  | 10CA0000  | 432367   | 427238   | 1 01-Jan 10          | 1715 A                | Wet / Dan   | r Darkness:   | Fine witho P   | assenger   | Slight   | Male         | 18        | B Car         |             |               |            |
| 11  | 10CA0000  | 432367   | 427238   | 1 01-Jan-10          | 1715 A                | Wet / Dan   | Darkness:     | Fine witho P   | assenger   | Slight   | Male         | 19        | 9 Car         |             |               |            |
| 15  | 10CA0000  | 3 432367 | 427238   | 1 01-Jan-10          | 1715 A                | Wet / Dan   | t Darkness:   | Fine witho P   | assenger   | Slight   | Male         | 2         | 1 Car         |             |               |            |
| 13  | 10CA0000  | 430653   | 434680   | 2 02-Jan-10          | 1730 A                | Wet / Dan   | r Darkness:   | Snowing will   | Iriver     | Slight   | Mole         | - 24      | 6 Car         |             |               |            |
| 14  | 10CA0000  | 428267   | 426152   | 2 02-Jan-10          | 1820 A                | Snow        | Darkness:     | Snowing w0     | Driver     | Slight   | Market       | 24        | 6 Car         |             |               |            |
| 15  | 10CA0000  | 428267   | 426152   | 2 02-Jan-10          | 1820 A                | Snow        | Darkness:     | Snowing will   | Driver     | slight   | Male         | 3         | 8 Car         |             |               |            |
| 16  | 10840000  | 435011   | 436276   | 2 03-Jan-10          | 2020 Unclassifie      | Wet / Dan   | Darkness:     | Fine witho 0   | Driver     | Slight   | Male         | 20        | D Car         |             |               |            |
| 17  | 108A0000  | 0 435011 | 436276   | 2 03-ian-10          | 2020 Unclassifie      | Wet / Dan   | r Darkness:   | Fine witho P   | assenger   | Slight   | Female       | 14        | 8 Car         |             |               |            |
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| 19  | 10CA0000  | 428594   | 427816   | 1 03-Jan-10          | 1155 A                | Frost/ ke   | Daylight: 1   | Fine witho P   | usseruger. | Slight   | Female       | 64        | 4 Cat         |             |               |            |
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| 21  | 10CA0000  | 428552   | 427713   | 1 03-Jan-10          | 3015 A                | Snow        | Daylight: s   | s Fine witho P | assenger.  | Slight   | Female       | - 14      | B Car         |             |               |            |
| 22  | 10CA0000  | 424323   | 427170   | 2 03-Jan-10          | 2243 A                | Wet / Dan   | r Darkness:   | Other P        | assenger   | Slight   | Female       | 30        | 6 Car         |             |               |            |
| 23  | 10CA0000  | 424323   | 427170   | 2 03-Jan-10          | 2243 A                | Wet / Dan   | r Darkness:   | Other P        | assenger.  | Slight   | Female       | 3         | 9 Car         |             |               |            |
| 24  | 10CA0000  | 424323   | 427170   | 2 03-Jan-10          | 2243 A                | Wet / Dan   | r Darkmena:   | Other P        | assenger   | Slight   | Female       | 1         | 7 Car         |             |               |            |
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| 27  | 10440000  | X 429601 | 634670   | 2 04-Jan-10          | 1330 A                | Wet / Dan   | r Daylight: s | s Fine witho P | assenger   | Slight   | Male         | 19        | 9 Car         |             |               |            |
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Figure1: The Dataset Diagram

#### **3.Result and Analysis:**

As privacy is one of the breach that we having in the big data. Thus, we have come up with data anonymization technic, where we are using the latest technologies so that the process can be easy, fast, reliable. Here we are using the Rjindael algorithms to anonymize the data

There are two ends named Producer and the Consumer, where the data from the Producer is transferred to the Consumer in the Apache Kafka.

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Figure2: the data sent from the Producer

The data sent from the producer is been sent as the way it is been stored in the dataset

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Figure3: the data received at the consumer end

The data received at the Consumer, has the sensitive data which have been Encrypted. The Encrypted data are being stored in the same format in the database at Cassandra.

#### 4.Conclusion:

From the present study we can conclude that, the privacy breach can be minimized with the help of the encryption techniques which we have used. With the help of this the concern of each client on his data, sensitive data's can be safe from the data theft or misuse of the data can also be reduced. As well these changes can also be implemented on the real time object. Where the latest technologies can be used to make it faster and more flexible to use.

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