```
In [1]: from TSForecasting.TsForecasting import TimeSeriesForecast
import pandas as pd
pd.set_option("max_rows", None)
```

Using TensorFlow backend.

Reading all of the data

```
In [2]: hall raw = pd.read csv('~/Desktop/NCSA genomics/Python - notebooks/TSFor
     ecasting/Data/Hall/data hall raw.csv')
     hall meta = pd.read csv('~/Desktop/NCSA genomics/Python - notebooks/TSFo
     recasting/Data/Hall/Hall meta.csv')
     cgm appended = pd.read csv('~/Desktop/NCSA genomics/Python - notebooks/T
     SForecasting/Data/CGM/CGM Analyzer Appended.csv')
     cgm meta = pd.read csv('~/Desktop/NCSA genomics/Python - notebooks/TSFor
     ecasting/Data/CGM/CGM-meta.csv')
     gluvarpro = pd.read_csv('~/Desktop/NCSA_genomics/Python - notebooks/TSFo
     recasting/Data/Gluvarpro/Gluvarpro.csv')
     gluvarpro meta = pd.read csv('~/Desktop/NCSA genomics/Python - notebook
     s/TSForecasting/Data/Gluvarpro/GVP metadata.csv')
     ohio full = pd.read csv('~/Desktop/NCSA genomics/Python - notebooks/TSFo
     recasting/Data/Ohio-Data/OhioFullConsolidated.csv')
     ohio meta = pd.read csv('~/Desktop/NCSA genomics/Python - notebooks/TSFo
     recasting/Data/Ohio-Data/Ohio metadata.csv')
     consolidated_paper = pd.read_csv('~/Desktop/NCSA_genomics/Python - noteb
     ooks/TSForecasting/Data/consolidatedDataForPaper.csv')
     consolidated pkg = pd.read csv('~/Desktop/NCSA genomics/Python - noteboo
     ks/TSForecasting/Data/consolidatedDataForPackage.csv')
     consolidated meta = pd.read csv('~/Desktop/NCSA genomics/Python - notebo
     oks/TSForecasting/Data/consolidatedMetadata.csv')
```

Creating an object

```
In [3]: obj = TimeSeriesForecast()
```

Object Created!

A description of the HALL dataset

In [4]: obj.dataDescribe(hall_raw,hall_meta)

Here is a glimpse of the data:

	Dis	play Time	GlucoseValue	subjectId
0	2014-02-03	03:42:12	93	1636-69-001
1	2014-02-03	03:47:12	93	1636-69-001
2	2014-02-03	03:52:12	93	1636-69-001
3	2014-02-03	03:57:12	95	1636-69-001
4	2014-02-03	04:02:12	96	1636-69-001

Total Readings in the data:105426

	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days
count	57.000000	57.000000	57.000000	57.000000	57
mean	1849.578947	183.333333	51.192982	46.774794	29 days 02:20:02.333333
std	104.808149	34.955754	18.966548	17.501540	74 days 06:47:55.221313
min	1584.000000	111.000000	0.000000	21.235955	5 days 16:14:32
25%	1796.000000	153.000000	46.000000	35.487179	6 days 07:39:25
50%	1822.000000	183.000000	54.000000	43.051948	6 days 23:39:38
75%	1877.000000	204.000000	62.000000	55.710145	8 days 07:49:13
max	2361.000000	303.000000	91.000000	128.200000	423 days 11:25:54

Here is the statistical analysis of the data:

	Subject ID	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days	Start	End
0	2133- 041	1858	204	51	45.493976	8 days 02:09:26	2017-07- 03 18:32:06	2017-07- 11 20:41:32
1	2133- 040	1792	171	59	40.560000	6 days 10:44:37	2017-06- 28 13:34:52	2017-07- 05 00:19:29
2	2133- 039	2013	204	50	60.892857	9 days 01:34:20	2017-06- 05 12:23:22	2017-06- 14 13:57:42
3	2133- 037	1785	153	48	39.967391	6 days 07:39:25	2017-06- 05 14:11:14	2017-06- 11 21:50:39
4	2133- 036	1954	214	58	63.841270	8 days 15:04:26	2017-06- 01 15:26:53	2017-06- 10 06:31:19
5	2133- 035	1830	190	47	44.032258	7 days 05:49:42	2017-06- 01 17:17:00	2017-06- 08 23:06:42
6	2133- 033	1892	161	49	43.051948	7 days 07:04:31	2017-05- 19 12:58:22	2017-05- 26 20:02:53
7	2133- 032	1781	147	69	34.365079	6 days 04:34:25	2017-05- 19 13:31:19	2017-05- 25 18:05:44
8	2133- 030	1818	147	41	36.596774	6 days 18:44:36	2017-05- 03 14:13:09	2017-05- 10 08:57:45
9	2133- 028	1850	111	45	21.235955	7 days 02:04:30	2017-05- 10 00:03:32	2017-05- 17 02:08:02
10	2133- 027	1936	155	60	33.625000	8 days 02:13:55	2017-04- 24 14:49:24	2017-05- 02 17:03:19
11	2133- 026	1782	166	45	37.147727	6 days 04:39:35	2017-04- 19 14:10:22	2017-04- 25 18:49:57
12	2133- 025	1865	175	45	32.525773	6 days 18:09:38	2017-04- 19 13:34:14	2017-04- 26 07:43:52
13	2133- 024	1821	180	41	46.387097	6 days 13:09:23	2017-04- 17 14:14:20	2017-04- 24 03:23:43
14	2133- 023	1838	142	0	32.804598	7 days 10:09:25	2017-04- 17 14:49:45	2017-04- 25 00:59:10
15	2133- 022	1814	204	0	61.949153	6 days 12:34:33	2017-03- 22 13:34:24	2017-03- 29 02:08:57

	Subject ID	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days	Start	End
16	2133-	1707	226	62	92 25556	6 days	2017-03- 17	2017-03-
16	021	1797	236	62	83.355556	07:39:27	13:34:51	23 21:14:18
17	2133-	1826	201	40	70.418182	6 days	2017-03- 17	2017-03- 23
.,	020	1020	201	10	70.110102	10:04:43	12:56:49	23:01:32
18	2133-	1801	192	53	43.703125	9 days	2017-03- 15	2017-03- 24
	019					04:34:17	16:37:47	21:12:04
19	2133- 018	1775	303	73	128.200000	6 days 04:39:35	2017-03- 14	2017-03- 20
	016					04.39.35	13:30:04	18:09:39
20	2133- 017	1799	182	68	53.517857	6 days 10:04:23	2017-03- 13	2017-03- 19
	017					10.04.20	12:22:38	22:27:01
21	2133- 015	1835	213	58	47.797101	6 days 17:34:22	2017-01-	2017-02-
							13:33:25	07:07:47
22	2133- 013	1960	206	0	47.686567	8 days 07:49:13	2017-01-	2017-01-
							15:25:11 2017-01-	23:14:24
23	2133- 012	1935	148	49	35.575472	12 days 10:14:03	11 14:49:44	24 01:03:47
	0400					0.1	2017-01-	2017-01-
24	2133- 011	1933	204	0	48.287671	9 days 05:54:03	10 15:29:05	19 21:23:08
	2133-					6 days	2016-11-	2016-11-
25	010	1832	143	62	30.287037	6 days 17:29:32	21 15:28:45	28 08:58:17
	2133-					6 days	2016-11-	2016-11-
26	009	1781	183	59	45.100000	04:34:44	21 13:33:38	27 18:08:22
07	2133-	4005	407	40	00 507040	6 days	2016-11-	2016-11-
27	800	1805	137	49	30.567010	07:34:31	22 00:03:05	28 07:37:36
28	2133-	1877	207	65	47.830986	7 days	2016-11- 01	2016-11- 09
20	007	1011	201	00	47.000300	23:14:19	13:30:28	12:44:47
29	2133-	1777	148	54	33.437500	6 days	2016-11- 01	2016-11- 07
20	006			0.	00.107000	04:29:35	00:00:51	04:30:26
30	2133-	1776	246	61	78.862069	6 days	2016-09- 21	2016-09- 27
	004					04:29:28	00:04:11	04:33:39
31	2133-	1805	190	62	58.192982	6 days	2016-09- 02	2016-09- 09
	003					07:04:28	17:51:46	00:56:14
32	2133- 002	1806	163	60	33.593750	6 days 10:44:31	2016-09- 09	2016-09- 16
	002					10.44.01	16:02:22	02:46:53

	Subject ID	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days	Start	End
33	2133- 001	1814	186	47	36.361702	7 days 00:59:29	2016-08- 03 00:00:14	2016-08- 10 00:59:43
34	1636- 70- 1010	1820	186	54	53.630137	88 days 21:13:56	2016-03- 02 15:29:17	2016-05- 30 12:43:13
35	1636- 70- 1008	1760	223	51	61.707317	6 days 04:34:32	2015-12- 07 13:34:23	2015-12- 13 18:08:55
36	1636- 70- 1005	1846	225	52	60.507042	8 days 03:24:24	2016-04- 06 14:13:52	2016-04- 14 17:38:16
37	1636- 70- 1003	1895	146	46	39.755814	7 days 07:39:28	2015-12- 01 00:03:03	2015-12- 08 07:42:31
38	1636- 70- 1002	1794	168	57	42.459770	6 days 07:34:30	2015-11- 12 00:02:25	2015-11- 18 07:36:55
39	1636- 69-123	1905	138	49	29.847619	8 days 01:34:20	2016-02- 17 00:01:50	2016-02- 25 01:36:10
40	1636- 69-114	1796	163	76	35.773333	6 days 06:59:31	2015-10- 13 00:03:47	2015-10- 19 07:03:18
41	1636- 69-111	1868	135	0	27.220000	21 days 00:18:50	2015-09- 15 03:41:33	2015-10- 06 04:00:23
42	1636- 69-107	1897	195	66	42.875000	7 days 10:09:27	2015-09- 24 13:33:14	2015-10- 01 23:42:41
43	1636- 69-104	2361	152	46	36.252101	201 days 18:23:29	2015-08- 05 14:46:39	2016-02- 23 09:10:08
44	1636- 69-100	1880	153	41	34.094340	175 days 02:10:50	2015-09- 15 00:03:15	2016-03- 08 02:14:05
45	1636- 69-091	1803	163	70	36.440000	6 days 10:09:39	2015-11- 04 14:48:20	2015-11- 11 00:57:59
46	1636- 69-090	1863	195	54	57.235294	6 days 23:39:38	2016-02- 10 00:02:40	2016-02- 16 23:42:18
47	1636- 69-069	1897	187	69	53.274510	22 days 15:48:01	2015-07- 20 13:33:11	2015-08- 12 05:21:12
48	1636- 69-064	1584	218	43	56.810811	5 days 16:14:32	2015-03- 26 14:49:42	2015-04- 01 07:04:14
49	1636- 69-060	1821	191	91	35.487179	6 days 14:59:31	2015-11- 17 15:25:53	2015-11- 24 06:25:24

	Subject ID	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days	Start	End
50	1636- 69-053	1867	183	43	41.277778	299 days 01:32:14	2015-05- 07 18:34:18	2016-03- 01 20:06:32
51	1636- 69-048	1779	144	63	27.657143	6 days 04:34:29	2015-11- 26 00:36:15	2015-12- 02 05:10:44
52	1636- 69-035	2180	234	69	62.825397	11 days 01:04:20	2016-01- 27 00:02:25	2016-02- 07 01:06:45
53	1636- 69-032	1783	191	67	29.622642	6 days 04:34:32	2016-01- 13 12:58:17	2016-01- 19 17:32:49
54	1636- 69-028	1822	216	55	44.171875	75 days 07:45:22	2015-04- 02 13:33:15	2015-06- 16 21:18:37
55	1636- 69-026	1796	182	62	55.710145	7 days 01:29:34	2015-11- 24 00:37:20	2015-12- 01 02:06:54
56	1636- 69-001	1846	250	64	74.276596	423 days 11:25:54	2014-02- 03 03:42:12	2015-04- 02 15:08:06

A description of the CGM Analyzer and CGM Analysis combined dataset

In [5]: obj.dataDescribe(cgm_appended,cgm_meta)

Here is a glimpse of the data:

	Disp	play Time	subjectId	GlucoseValue
0	2016-06-25	09:14:00	ID01	108.000
1	2016-06-25	09:17:00	ID01	108.000
2	2016-06-25	09:20:00	ID01	108.000
3	2016-06-25	09:23:00	ID01	107.658
4	2016-06-25	09:26:00	ID01	107.496

Total Readings in the data:31791

	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days
count	14.000000	14.000000	14.000000	14.000000	14
mean	2270.785714	246.283571	61.954286	77.748718	6 days 07:28:30
std	692.305533	93.808260	23.631486	42.317059	3 days 08:57:56.850301
min	1265.000000	163.800000	14.020000	33.992727	3 days 00:06:00
25%	1692.750000	183.442500	49.097500	50.232260	4 days 10:40:30
50%	2338.500000	208.100000	62.890000	62.651429	5 days 09:51:00
75%	2906.500000	286.477500	73.012500	85.838143	6 days 09:47:15
max	3260.000000	508.710000	95.400000	179.607679	13 days 21:59:00

Here is the statistical analysis of the data:

	Subject ID	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days	Start	End
0	ID33	1265	163.80	39.60	33.992727	13 days 15:49:00	2019-02- 21 14:59:00	2019-03- 07 06:48:00
1	ID32	1337	202.00	47.00	55.223881	13 days 21:59:00	2018-08- 01 12:00:00	2018-08- 15 09:59:00
2	ID31	1443	182.19	66.47	48.568387	3 days 00:06:00	2016-06- 06 16:55:00	2016-06- 09 17:01:00
3	ID30	2472	187.20	59.40	39.564706	5 days 03:33:00	2016-12- 21 07:29:00	2016-12- 26 11:02:00
4	ID29	1728	195.64	75.15	57.160000	3 days 14:21:00	2016-12- 19 22:42:00	2016-12- 23 13:03:00
5	ID23	3260	326.83	64.53	87.135429	6 days 18:57:00	2016-10- 11 15:34:00	2016-10- 18 10:31:00
6	ID22	2111	170.39	34.20	56.753500	4 days 09:30:00	2016-12- 29 07:35:00	2017-01- 02 17:05:00
7	ID21	2686	214.20	66.60	68.142857	5 days 14:15:00	2016-11- 22 07:26:00	2016-11- 27 21:41:00
8	ID13	1681	246.06	94.75	81.946286	3 days 12:00:00	2016-12- 01 07:44:00	2016-12- 04 19:44:00
9	ID12	2980	271.80	93.60	78.646154	6 days 04:57:00	2016-08- 02 08:19:00	2016-08- 08 13:16:00
10	ID11	2205	316.80	95.40	124.305882	4 days 14:12:00	2017-01- 07 08:52:00	2017-01- 11 23:04:00
11	ID03	3097	508.71	61.25	179.607679	6 days 10:48:00	2016-05- 26 06:09:00	2016-06- 01 16:57:00
12	ID02	3016	170.98	14.02	40.234656	6 days 06:45:00	2016-05- 26 07:50:00	2016-06- 01 14:35:00
13	ID01	2510	291.37	55.39	137.199913	5 days 05:27:00	2016-06- 25 09:14:00	2016-06- 30 14:41:00

Data Description

A description of the Gluvarpro dataset

In [6]: obj.dataDescribe(gluvarpro,gluvarpro_meta)

Here is a glimpse of the data:

	Disp	play Time	subjectId	GlucoseValue
0	2016-06-21	00:00:00	GVP01	197.0
1	2016-06-21	00:15:00	GVP01	208.0
2	2016-06-21	00:30:00	GVP01	226.0
3	2016-06-21	00:45:00	GVP01	241.0
4	2016-06-21	01:00:00	GVP01	250.0

Total Readings in the data:46272

	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days
count	2.000000	2.000000	2.00000	2.000000	2
mean	23136.000000	388.000000	12.50000	154.736497	286 days 11:45:00
std	31904.657967	57.982756	17.67767	49.295600	396 days 16:29:08.526824
min	576.000000	347.000000	0.00000	119.879244	5 days 23:45:00
25%	11856.000000	367.500000	6.25000	137.307871	146 days 05:45:00
50%	23136.000000	388.000000	12.50000	154.736497	286 days 11:45:00
75%	34416.000000	408.500000	18.75000	172.165124	426 days 17:45:00
max	45696.000000	429.000000	25.00000	189.593750	566 days 23:45:00

Here is the statistical analysis of the data:

	Subject ID	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days	Start	End
0	GVP03	45696	429.0	25.0	119.879244	566 days 23:45:00	2016-04- 24 00:00:00	2017-11-11 23:45:00
1	GVP01	576	347.0	0.0	189.593750	5 days 23:45:00	2016-06- 21 00:00:00	2016-06-26 23:45:00

Data Description

Α	descrir	otion	of the	OHIO	dataset

5/21/2020

In [7]: obj.dataDescribe(ohio_full,ohio_meta)

Here is a glimpse of the data:

	Disp	play Time	subjectId	GlucoseValue
0	2021-12-07	16:29:00	OD570	101
1	2021-12-07	16:34:00	OD570	100
2	2021-12-07	16:39:00	OD570	100
3	2021-12-07	16:44:00	OD570	99
4	2021-12-07	16:49:00	OD570	98

Total Readings in the data:166533

	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days
count	12.000000	12.000000	12.000000	12.000000	12
mean	13877.750000	391.416667	41.583333	136.386108	54 days 16:07:58.333333
std	1058.275194	17.536758	2.937480	16.679054	2 days 04:52:22.142062
min	11444.000000	345.000000	40.000000	114.286517	50 days 07:28:00
25%	13331.750000	394.750000	40.000000	125.511687	53 days 16:33:26.500000
50%	13673.500000	400.000000	40.000000	134.900485	54 days 21:50:00
75%	14724.250000	400.000000	41.250000	144.084935	56 days 05:14:08.250000
max	15431.000000	400.000000	48.000000	176.277311	57 days 17:56:00

Here is the statistical analysis of the data:

	Subject ID	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days	Start	End
0	OD596	13620	367	40	124.296748	57 days 17:56:00	2027-04- 09 16:15:00	2027-06- 06 10:11:00
1	OD591	13607	397	40	131.562874	54 days 04:07:00	2021-11- 30 17:06:00	2022-01- 23 21:13:00
2	OD588	15431	400	40	114.286517	55 days 12:05:00	2021-08- 30 11:53:00	2021-10- 24 23:58:00
3	OD584	14815	400	40	143.393293	56 days 09:29:00	2025-05- 14 00:03:00	2025-07- 09 09:32:00
4	OD575	14456	400	40	138.238095	54 days 22:25:00	2021-11- 17 12:04:00	2022-01- 11 10:29:00
5	OD570	13727	388	46	149.743169	50 days 07:28:00	2021-12- 07 16:29:00	2022-01- 26 23:57:00
6	OD567	13247	400	40	146.159864	56 days 23:07:43	2026-12- 28 00:04:30	2027-02- 22 23:12:13
7	OD563	14694	400	40	118.305263	54 days 19:40:00	2021-09- 13 12:33:00	2021-11- 07 08:13:00
8	OD559	13310	400	40	176.277311	51 days 22:21:00	2021-12- 07 01:17:00	2022-01- 27 23:38:00
9	OD552	11444	345	45	125.916667	52 days 05:52:46	2025-04- 16 11:17:05	2025-06- 07 17:09:51
10	OD544	13339	400	48	138.623529	54 days 21:15:00	2027-05- 11 00:02:00	2027-07- 04 21:17:00
11	OD540	14843	400	40	129.829971	56 days 03:49:11	2027-05- 19 11:36:29	2027-07- 14 15:25:40

A description of the consolidated dataset for the paper (cgmanalysis, CGManalyzer, gluvarpro, Ohio)

In [8]: obj.dataDescribe(consolidated_paper,consolidated_meta)

Here is a glimpse of the data:

	Disp	olay Time	subjectId	GlucoseValue
0	2016-06-21	00:00:00	GVP01	197.0
1	2016-06-21	00:15:00	GVP01	208.0
2	2016-06-21	00:30:00	GVP01	226.0
3	2016-06-21	00:45:00	GVP01	241.0
4	2016-06-21	01:00:00	GVP01	250.0

Total Readings in the data:212853

	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days
count	28.000000	28.000000	28.000000	28.000000	28
mean	7601.892857	317.106071	49.691429	108.196373	42 days 14:19:02.678571
std	8762.341947	98.519774	22.217624	45.395263	104 days 12:44:49.738624
min	576.000000	163.800000	0.000000	33.992727	3 days 00:06:00
25%	2181.500000	211.150000	40.000000	65.397143	5 days 12:03:00
50%	3178.500000	346.000000	42.500000	120.877433	13 days 18:54:00
75%	10903.250000	400.000000	62.070000	139.814124	45 days 11:30:00
max	45696.000000	508.710000	95.400000	189.593750	566 days 23:45:00

Here is the statistical analysis of the data:

	Subject ID	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days	Start	End
0	OD596	10877	367.00	40.00	121.875622	47 days 07:44:00	2027-04- 09 16:15:00	2027-05- 26 23:59:00
1	OD591	10847	397.00	40.00	133.250923	44 days 06:52:00	2021-11- 30 17:06:00	2022-01- 13 23:58:00
2	OD588	12640	400.00	40.00	112.819398	45 days 12:02:00	2021-08- 30 11:53:00	2021-10- 14 23:55:00
3	OD584	12150	400.00	40.00	143.566308	45 days 23:53:00	2025-05- 14 00:03:00	2025-06- 28 23:56:00
4	OD575	11866	400.00	40.00	140.910156	45 days 11:51:00	2021-11- 17 12:04:00	2022-01- 01 23:55:00
5	OD570	10982	377.00	46.00	145.633333	40 days 07:30:00	2021-12- 07 16:29:00	2022-01- 16 23:59:00
6	OD567	10858	400.00	40.00	145.016461	46 days 23:54:51	2026-12- 28 00:04:30	2027-02- 12 23:59:21
7	OD563	12124	400.00	40.00	119.387931	45 days 11:23:00	2021-09- 13 12:33:00	2021-10- 28 23:56:00
8	OD559	10796	400.00	40.00	179.030303	41 days 22:39:00	2021-12- 07 01:17:00	2022-01- 17 23:56:00
9	OD552	9080	345.00	45.00	125.322917	38 days 12:42:09	2025-04- 16 11:17:05	2025-05- 24 23:59:14
10	OD544	10623	400.00	48.00	139.448780	43 days 23:53:00	2027-05- 11 00:02:00	2027-06- 23 23:55:00
11	OD540	11947	369.00	40.00	125.281250	45 days 12:20:15	2027-05- 19 11:36:29	2027-07- 03 23:56:44
12	ID33	1265	163.80	39.60	33.992727	13 days 15:49:00	2019-02- 21 14:59:00	2019-03- 07 06:48:00
13	ID32	1337	202.00	47.00	55.223881	13 days 21:59:00	2018-08- 01 12:00:00	2018-08- 15 09:59:00
14	ID31	1443	182.19	66.47	48.568387	3 days 00:06:00	2016-06- 06 16:55:00	2016-06- 09 17:01:00
15	ID30	2472	187.20	59.40	39.564706	5 days 03:33:00	2016-12- 21 07:29:00	2016-12- 26 11:02:00

	Subject ID	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days	Start	End
16	ID29	1728	195.64	75.15	57.160000	3 days	2016-12- 19	2016-12- 23
10	1029	1720	195.04	75.15	57.160000	14:21:00	22:42:00	13:03:00
17	ID23	3260	326.83	64.53	87.135429	6 days 18:57:00	2016-10- 11 15:34:00	2016-10- 18 10:31:00
18	ID22	2111	170.39	34.20	56.753500	4 days 09:30:00	2016-12- 29 07:35:00	2017-01- 02 17:05:00
19	ID21	2686	214.20	66.60	68.142857	5 days 14:15:00	2016-11- 22 07:26:00	2016-11- 27 21:41:00
20	ID13	1681	246.06	94.75	81.946286	3 days 12:00:00	2016-12- 01 07:44:00	2016-12- 04 19:44:00
21	ID12	2980	271.80	93.60	78.646154	6 days 04:57:00	2016-08- 02 08:19:00	2016-08- 08 13:16:00
22	ID11	2205	316.80	95.40	124.305882	4 days 14:12:00	2017-01- 07 08:52:00	2017-01- 11 23:04:00
23	ID03	3097	508.71	61.25	179.607679	6 days 10:48:00	2016-05- 26 06:09:00	2016-06- 01 16:57:00
24	ID02	3016	170.98	14.02	40.234656	6 days 06:45:00	2016-05- 26 07:50:00	2016-06- 01 14:35:00
25	ID01	2510	291.37	55.39	137.199913	5 days 05:27:00	2016-06- 25 09:14:00	2016-06- 30 14:41:00
26	GVP03	45696	429.00	25.00	119.879244	566 days 23:45:00	2016-04- 24 00:00:00	2017-11- 11 23:45:00
27	GVP01	576	347.00	0.00	189.593750	5 days 23:45:00	2016-06- 21 00:00:00	2016-06- 26 23:45:00

A description of the consolidated dataset for the package (cgmanalysis, CGManalyzer, gluvarpro, Ohio, Hall)

In [9]: obj.dataDescribe(consolidated_pkg,consolidated_meta)

Here is a glimpse of the data:

	Disp	play Time	subjectId	GlucoseValue
0	2016-06-21	00:00:00	GVP01	197.0
1	2016-06-21	00:15:00	GVP01	208.0
2	2016-06-21	00:30:00	GVP01	226.0
3	2016-06-21	00:45:00	GVP01	241.0
4	2016-06-21	01:00:00	GVP01	250.0

Total Readings in the data:316527

	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days
count	88.000000	88.000000	88.000000	88.000000	88
mean	3596.897727	225.158750	54.401818	66.413985	18 days 02:02:08.431818
std	5608.523425	88.449577	15.749254	41.071826	60 days 15:06:20.611443
min	576.000000	111.000000	0.000000	21.235955	2 days 01:54:50
25%	1778.500000	165.450000	44.750000	36.557581	6 days 04:34:32
50%	1821.000000	191.500000	52.500000	48.596693	6 days 12:51:58
75%	2128.250000	246.015000	64.132500	79.633123	8 days 02:10:33.250000
max	45696.000000	508.710000	95.400000	189.593750	566 days 23:45:00

Here is the statistical analysis of the data:

	Subject ID	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days	Start	End
0	OD596	10877	367.00	40.00	121.875622	47 days 07:44:00	2027-04- 09 16:15:00	2027-05- 26 23:59:00
1	OD591	10847	397.00	40.00	133.250923	44 days 06:52:00	2021-11- 30 17:06:00	2022-01- 13 23:58:00
2	OD588	12640	400.00	40.00	112.819398	45 days 12:02:00	2021-08- 30 11:53:00	2021-10- 14 23:55:00
3	OD584	12150	400.00	40.00	143.566308	45 days 23:53:00	2025-05- 14 00:03:00	2025-06- 28 23:56:00
4	OD575	11866	400.00	40.00	140.910156	45 days 11:51:00	2021-11- 17 12:04:00	2022-01- 01 23:55:00
5	OD570	10982	377.00	46.00	145.633333	40 days 07:30:00	2021-12- 07 16:29:00	2022-01- 16 23:59:00
6	OD567	10858	400.00	40.00	145.016461	46 days 23:54:51	2026-12- 28 00:04:30	2027-02- 12 23:59:21
7	OD563	12124	400.00	40.00	119.387931	45 days 11:23:00	2021-09- 13 12:33:00	2021-10- 28 23:56:00
8	OD559	10796	400.00	40.00	179.030303	41 days 22:39:00	2021-12- 07 01:17:00	2022-01- 17 23:56:00
9	OD552	9080	345.00	45.00	125.322917	38 days 12:42:09	2025-04- 16 11:17:05	2025-05- 24 23:59:14
10	OD544	10623	400.00	48.00	139.448780	43 days 23:53:00	2027-05- 11 00:02:00	2027-06- 23 23:55:00
11	OD540	11947	369.00	40.00	125.281250	45 days 12:20:15	2027-05- 19 11:36:29	2027-07- 03 23:56:44
12	ID33	1265	163.80	39.60	33.992727	13 days 15:49:00	2019-02- 21 14:59:00	2019-03- 07 06:48:00
13	ID32	1337	202.00	47.00	55.223881	13 days 21:59:00	2018-08- 01 12:00:00	2018-08- 15 09:59:00
14	ID31	1443	182.19	66.47	48.568387	3 days 00:06:00	2016-06- 06 16:55:00	2016-06- 09 17:01:00
15	ID30	2472	187.20	59.40	39.564706	5 days 03:33:00	2016-12- 21 07:29:00	2016-12- 26 11:02:00

End	Start	Days	MAGE Score	Min. Glucose Value	Max. Glucose Value	Length of readings	Subject ID	
2016-12-	2016-12-	3 days						
23 13:03:00	19 22:42:00	14:21:00	57.160000	75.15	195.64	1728	ID29	16
2016-10-	2016-10-	6 days	07 125 420	64.52	206.02	2260	IDaa	17
18 10:31:00	11 15:34:00	18:57:00	87.135429	64.53	326.83	3260	ID23	17
2017-01- 02	2016-12- 29	4 days 09:30:00	56.753500	34.20	170.39	2111	ID22	18
17:05:00	07:35:00	09.30.00						
2016-11- 27	2016-11- 22	5 days 14:15:00	68.142857	66.60	214.20	2686	ID21	19
21:41:00	07:26:00	14.15.00						
2016-12- 04	2016-12- 01	3 days	81.946286	94.75	246.06	1681	ID13	20
19:44:00	07:44:00	12:00:00						
2016-08- 08	2016-08- 02	6 days	78.646154	93.60	271.80	2980	ID12	21
13:16:00	08:19:00	04:57:00	70.010101	00.00	271.00	2000	1512	۷,
2017-01- 11	2017-01- 07	4 days	124.305882	95.40	316.80	2205	ID11	22
23:04:00	08:52:00	14:12:00	12 1.000002	00.10	010.00	2200	1511	
2016-06- 01	2016-05- 26	6 days	179.607679	61.25	508.71	3097	ID03	23
16:57:00	06:09:00	10:48:00	170.007070	01.20	000.7 1	0007	1000	20
2016-06- 01	2016-05- 26	6 days	40.234656	14.02	170.98	3016	ID02	24
14:35:00	07:50:00	06:45:00	40.234030	14.02	170.96	3010	1002	24
2016-06- 30	2016-06- 25	5 days	137.199913	55.39	291.37	2510	ID01	25
14:41:00	09:14:00	05:27:00	137.199913	33.39	291.37	2510	IDOT	25
2017-11- 11	2016-04- 24	566 days	119.879244	25.00	429.00	45696	GVP03	26
23:45:00	00:00:00	23:45:00	119.079244	25.00	429.00	43030	QVI 03	20
2016-06- 26	2016-06- 21	5 days	189.593750	0.00	347.00	576	GVP01	27
23:45:00	00:00:00	23:45:00	100.000700	0.00	047.00	070	avioi	
2017-07- 11	2017-07- 03	8 days	45.493976	51.00	204.00	1858	2133-	28
20:41:32	18:32:06	02:09:26	10.100070	01.00	201.00	1000	041	20
2017-07- 05	2017-06- 28	6 days	40.560000	59.00	171.00	1792	2133-	29
00:19:29	13:34:52	10:44:37	10.000000	00.00	171.00	1702	040	20
2017-06- 14	2017-06- 05	9 days	60.892857	50.00	204.00	2013	2133-	30
13:57:42	12:23:22	01:34:20	00.032037	30.00	204.00	2010	039	50
2017-06-	2017-06- 05	6 days	20.067201	48.00	152.00	1785	2133-	31
11 21:50:39	14:11:14	07:39:25	39.967391	46.00	153.00	1765	037	JI
2017-06- 10	2017-06- 01	8 days	63.841270	58.00	214.00	1954	2133-	32
06:31:19	15:26:53	15:04:26	00.041270	36.00	214.00	1934	036	JZ

End	Start	Days	MAGE Score	Min. Glucose Value	Max. Glucose Value	Length of readings	Subject ID	
2017-06- 08 23:06:42	2017-06- 01 17:17:00	7 days 05:49:42	44.032258	47.00	190.00	1830	2133- 035	33
2017-05- 26 20:02:53	2017-05- 19 12:58:22	7 days 07:04:31	43.051948	49.00	161.00	1892	2133- 033	34
2017-05- 25 18:05:44	2017-05- 19 13:31:19	6 days 04:34:25	34.365079	69.00	147.00	1781	2133- 032	35
2017-05- 10 08:57:45	2017-05- 03 14:13:09	6 days 18:44:36	36.596774	41.00	147.00	1818	2133- 030	36
2017-05- 17 02:08:02	2017-05- 10 00:03:32	7 days 02:04:30	21.235955	45.00	111.00	1850	2133- 028	37
2017-05- 02 17:03:19	2017-04- 24 14:49:24	8 days 02:13:55	33.625000	60.00	155.00	1936	2133- 027	38
2017-04- 25 18:49:57	2017-04- 19 14:10:22	6 days 04:39:35	37.147727	45.00	166.00	1782	2133- 026	39
2017-04- 26 07:43:52	2017-04- 19 13:34:14	6 days 18:09:38	32.525773	45.00	175.00	1865	2133- 025	40
2017-04- 24 03:23:43	2017-04- 17 14:14:20	6 days 13:09:23	46.387097	41.00	180.00	1821	2133- 024	41
2017-04- 25 00:59:10	2017-04- 17 14:49:45	7 days 10:09:25	31.505882	44.00	142.00	1838	2133- 023	42
2017-03- 29 02:08:57	2017-03- 22 13:34:24	6 days 12:34:33	60.593220	40.00	204.00	1814	2133- 022	43
2017-03- 23 21:14:18	2017-03- 17 13:34:51	6 days 07:39:27	83.355556	62.00	236.00	1797	2133- 021	44
2017-03- 23 23:01:32	2017-03- 17 12:56:49	6 days 10:04:43	70.418182	40.00	201.00	1826	2133- 020	45
2017-03- 17 18:32:37	2017-03- 15 16:37:47	2 days 01:54:50	51.421053	63.00	168.00	580	2133- 019-2	46
2017-03- 24 21:12:04	2017-03- 20 13:42:24	4 days 07:29:40	45.166667	53.00	192.00	1221	2133- 019	47
2017-03- 20 18:09:39	2017-03- 14 13:30:04	6 days 04:39:35	128.200000	73.00	303.00	1775	2133- 018	48
2017-03- 19 22:27:01	2017-03- 13 12:22:38	6 days 10:04:23	53.517857	68.00	182.00	1799	2133- 017	49

End	Start	Days	MAGE Score	Min. Glucose Value	Max. Glucose Value	Length of readings	Subject ID	
2017-02- 06 07:07:47	2017-01- 30 13:33:25	6 days 17:34:22	47.797101	58.00	213.00	1835	2133- 015	50
2017-01- 19 23:14:24	2017-01- 11 15:25:11	8 days 07:49:13	46.462687	41.00	206.00	1960	2133- 013	51
2017-01- 18 11:24:13	2017-01- 11 14:49:44	6 days 20:34:29	36.120879	49.00	148.00	1809	2133- 012	52
2017-01- 19 21:23:08	2017-01- 10 15:29:05	9 days 05:54:03	45.389610	47.00	204.00	1933	2133- 011	53
2016-11- 28 08:58:17	2016-11- 21 15:28:45	6 days 17:29:32	30.287037	62.00	143.00	1832	2133- 010	54
2016-11- 27 18:08:22	2016-11- 21 13:33:38	6 days 04:34:44	45.100000	59.00	183.00	1781	2133- 009	55
2016-11- 28 07:37:36	2016-11- 22 00:03:05	6 days 07:34:31	30.567010	49.00	137.00	1805	2133- 008	56
2016-11- 09 12:44:47	2016-11- 01 13:30:28	7 days 23:14:19	47.830986	65.00	207.00	1877	2133- 007	57
2016-11- 07 04:30:26	2016-11- 01 00:00:51	6 days 04:29:35	33.437500	54.00	148.00	1777	2133- 006	58
2016-09- 27 04:33:39	2016-09- 21 00:04:11	6 days 04:29:28	78.862069	61.00	246.00	1776	2133- 004	59
2016-09- 09 00:56:14	2016-09- 02 17:51:46	6 days 07:04:28	58.192982	62.00	190.00	1805	2133- 003	60
2016-09- 16 02:46:53	2016-09- 09 16:02:22	6 days 10:44:31	33.593750	60.00	163.00	1806	2133- 002	61
2016-08- 10 00:59:43	2016-08- 03 00:00:14	7 days 00:59:29	36.361702	47.00	186.00	1814	2133- 001	62
2016-05- 30 12:43:13	2016-05- 25 10:38:39	5 days 02:04:34	48.625000	75.00	186.00	1393	1636- 70-1010	63
2015-12- 13 18:08:55	2015-12- 07 13:34:23	6 days 04:34:32	61.707317	51.00	223.00	1760	1636- 70-1008	64
2016-04- 14 17:38:16	2016-04- 06 14:13:52	8 days 03:24:24	60.507042	52.00	225.00	1846	1636- 70-1005	65
2015-12- 08 07:42:31	2015-12- 01 00:03:03	7 days 07:39:28	39.755814	46.00	146.00	1895	1636- 70-1003	66

	Subject ID	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days	Start	End
	1636-			57.00	40.450770	6 days	2015-11-	2015-11-
67	70-1002	1794	168.00		42.459770	07:34:30	12 00:02:25	18 07:36:55
00	1636-	4005	100.00	10.00	00 047040	8 days	2016-02-	2016-02-
68	69-123	1905	138.00	49.00	29.847619	01:34:20	17 00:01:50	25 01:36:10
00	1636-	4700	100.00	70.00	05 770000	6 days	2015-10-	2015-10-
69	69-114	1796	163.00	76.00	35.773333	06:59:31	13 00:03:47	19 07:03:18
70	1636-	1700	105.00		00 070 474	6 days	2015-09-	2015-09-
70	69-111	1720	135.00	48.00	26.976471	06:24:41	15 03:41:33	21 10:06:14
74	1636-	1007	105.00	00.00	40.075000	7 days	2015-09-	2015-10-
71	69-107	1897	195.00	66.00	42.875000	10:09:27	24 13:33:14	01 23:42:41
72	1636- 69-104-	1153	140.00	46.00	35.805970	6 days	2016-02- 17	2016-02- 23
12	2	1155	140.00	46.00	35.605970	08:49:31	00:20:37	09:10:08
73	1636-	969	152.00	61.00	36.097561	5 days	2015-08- 05	2015-08- 11
73	69-104	909	132.00	01.00	30.097301	14:59:34	14:46:39	05:46:13
74	1636-	1716	153.00	66.00	28.298507	6 days	2015-09- 15	2015-09- 21
74	69-100	1710	155.00	66.00	26.296507	08:49:28	00:03:15	08:52:43
75	1636-	1803	163.00	70.00	36.440000	6 days	2015-11- 04	2015-11- 11
73	69-091	1005	100.00	70.00	30.440000	10:09:39	14:48:20	00:57:59
76	1636-	1863	195.00	54.00	57.235294	6 days	2016-02- 10	2016-02- 16
70	69-090	1000	130.00	3 1.00		23:39:38	00:02:40	23:42:18
77	1636-	1591	187.00	69.00	49.666667	6 days	2015-07- 20	2015-07- 27
	69-069	1001	107.00	00.00	10.000007	20:39:24	13:33:11	10:12:35
78	1636-	1584	218.00	43.00	56.810811	5 days	2015-03- 26	2015-04- 01
. •	69-064			.0.00		16:14:32	14:49:42	07:04:14
79	1636-	1821	191.00	91.00	35.487179	6 days	2015-11- 17	2015-11- 24
	69-060					14:59:31	15:25:53	06:25:24
80	1636-	1804	183.00	43.00	42.567164	6 days	2015-05- 07	2015-05- 14
	69-053					16:49:39	18:34:18	11:23:57
81	1636-	1779	144.00	63.00	27.657143	6 days 04:34:29	2015-11- 26	2015-12- 02
	69-048						00:36:15	05:10:44
82	1636-	2180	234.00	69.00	62.825397	11 days	2016-01- 27	2016-02- 07
	69-035					01:04:20	00:02:25	01:06:45
83	1636-	1783	191.00	67.00	29.622642	6 days	2016-01- 13	2016-01- 19
	69-032					04:34:32	12:58:17	17:32:49

	Subject ID	Length of readings	Max. Glucose Value	Min. Glucose Value	MAGE Score	Days	Start	End
84	1636- 69-028	1543	168.00	75.00	36.701754	5 days 19:59:40	2015-04- 02 13:33:15	2015-04- 08 09:32:55
85	1636- 69-026	1796	182.00	62.00	55.710145	7 days 01:29:34	2015-11- 24 00:37:20	2015-12- 01 02:06:54
86	1636- 69-001- 2	1092	250.00	64.00	66.657143	4 days 03:14:35	2015-03- 29 11:53:31	2015-04- 02 15:08:06
87	1636- 69-001	754	225.00	68.00	94.916667	2 days 14:49:45	2014-02- 03 03:42:12	2014-02- 05 18:31:57

In []: