Accidental Drug Death from 2012-2018

Group 4

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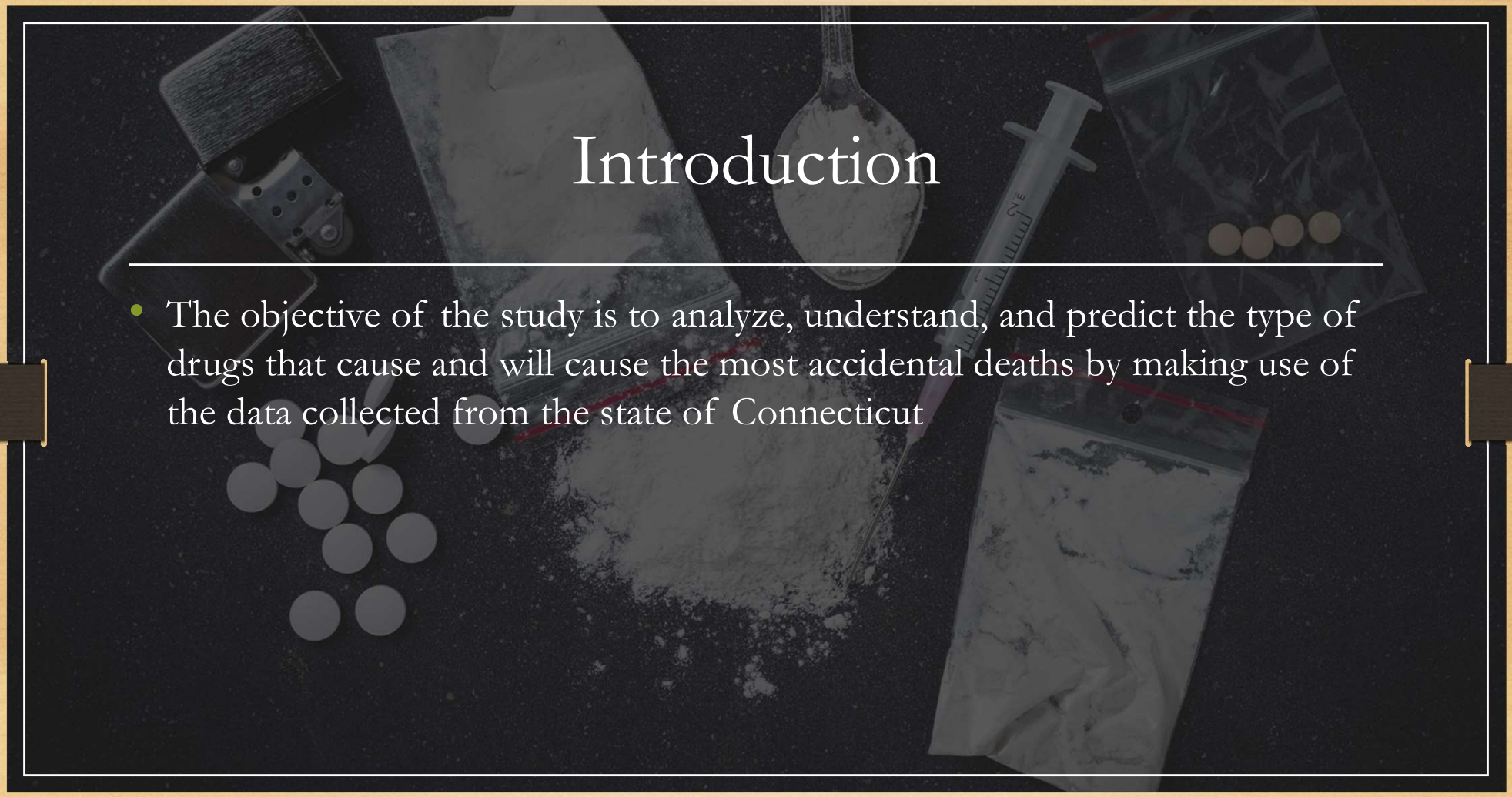
Abstract

- The increase of drugs has made it possible for people to have access to it more easily than before. The cases of drug abuse have escalated in a more drastic manner throughout the years. This has led to people to abuse them more constantly and seek them more frequently, causing an increase of what they can handle. This leads to unintentional drug overdose death, which has been claiming many people lives. The data obtain on governmental database would allow us to analyze and understand the type of drugs that are more being use as well which ones are being abuse the most. As well which one has a higher death count.

Data Size and Information

- Data used for this project was acquire from Data.gov
- Data name: Collection of Accidental Drug Related deaths 2012-2018
- Data size: 1.02MB
- Data Source: https://catalog.data.gov/dataset/accidental-drug-related-deaths-january-2012-sept-2015
- GitHub: https://github.com/GianV77/CIS3200Project.git
- Azure Gallery: https://gallery.cortanaintelligence.com/Experiment/Drug-overdose-death-2012-18
    - https://gallery.cortanaintelligence.com/Experiment/Accidental-Drug-Related-Deaths
- Kibana Dashboard: https://d39a26931e4747399a5bee5f8fd0c1b5.us-west-1.aws.found.io:9243/goto/07a82e393e0424c32bd986400708ccb8

Date	Age	Sex	Race	Residence	Residence	Residence	DeathCity	DeathCou	Location	LocationIf	Descriptic	InjuryPlac	InjuryCity	InjuryCou	InjurySta	COD	OtherSign	Heroin	Cocaine	Fentanyl	FentanylA	Oxycodon	Oxymorpl	Ethanol	Hydrocod	Benzodiaz	Methador	Amphet	Tramad	Morphine	Hydromor	Other	OpiateNO	AnyOpioi	MannerofDeath
6/28/2014											substance					Acute fent, hydrocod, benzodiazepine		Y		Y				Y	Y									Accident
3/21/2013	48	Male	Black	NORWALK			NORWALK	FAIRFIELD	Hospital							Cocaine Intoxication			Y																Accident
3/13/2016	30	Female	White	SANDY HC	FAIRFIELD	CT	DANBURY		Hospital		Substance	Unknown	UNKNOWN			Acute Heroin and Co		Y	Y														Y		Accident
3/31/2016	23	Male	White	RYE	WESTCHE	NY	GREENWICH		Hospital		substance	Residence	RYE			Acute Fentanyl and I		Y		Y													Y		Accident
2/13/2013	22	Male	Asian, Oth	FLUSHING	QUEENS		GREENWICH	FAIRFIELD	Hospital		Transderm	Other				Fentanyl Intoxication				Y															Accident
6/29/2014	23	Male	White	BRISTOL			BRISTOL	HARTFORD	Residence		Inhalation	Residence				Heroin Intoxication		Y																	Accident
8/12/2012	21	Female	White	WEST HAF	HARTFORD		WEST HAF	HARTFORD	Residence		Used Herc	Residence				Heroin Toxicity		Y																	Accident
##########	40	Female	White	HAMDEN	NEW HAVEN		NEW HAV	NEW HAV	Hospital							Complications of Cocaine Intox			Y																Accident
4/25/2012	40	Male	White	EAST HAR	HARTFORD		EAST HAR	HARTFORD	Residence		Used Herc	Residence				Heroin Toxicity		Y																	Accident
5/15/2013	50	Male	White	MONTVILL	NEW LONI		MONTVILL	NEW LONI	Residence		Ingestion	Residence				Oxycodone Intoxication						Y													Accident
8/23/2012	26	Female	Hispanic,	White			STRATFOR	FAIRFIELD	Other	Honey Spo	Injection/	Hotel or Motel				Multiple Drug Toxici		Y	Y																Accident
7/5/2015	49	Female	White				NEW HAV	NEW HAV	Hospital			Unknown				Acute intoxication fr		Y								Y								Y		Accident
												Unknown				Ruptured Acute Cocaine			Y																Accident
5/14/2015	50	Male	White	DANBURY	FAIRFIELD	CT	DANBURY	FAIRFIELD	Residence			Residence				Heroin Intoxication		Y															Y		Accident
1/13/2016	29	Male	Black	NEW HAV	NEW HAV	CT	NEW HAVEN		Residence		Substance	Residence	NEW HAVEN			Acute Heroin Intoxic		Y								Y		Y					Y		Accident
8/19/2013	45	Male	White	HARTFORI	HARTFORD		HARTFORI	HARTFORI	Residence		Ingestion	Residence				Methadone Intoxication											Y								Accident
1/29/2014	29	Female	White	CANTERBURY			HARTFORD		Hospital		Substance	Unknown				Acute intoxication d		Y								Y									Accident
3/2/2012	42	Male	White	WALLINGF	NEW HAVEN		WALLINGF	NEW HAV	Residence		Ingestion	Residence				Ethanol and Oxymorphone Toxicity							Y	Y											Accident
1/30/2016	54	Male	White	MIDDLETC	MIDDLESE	CT	MIDDLETOWN		Residence		Substance	Residence	MIDDLETOWN			Acute Heroin Intoxic		Y						Y										Y		Accident
##########	32	Male	White	WINDHAM	WINDHAM	CT	WINDHAM		Residence				WINDHAM			Acute Intoxication d		Y		Y						Y								Y		Accident
##########	47	Male	White	BRIDGEPORT			BRIDGEPO	FAIRFIELD	Residence		substance	Residence				Acute intoxication d		Y						Y											Accident
6/2/2015	39	Female	White	ANSONIA	NEW HAV	CT	DERBY	NEW HAV	Hospital			Residence	ANSONIA	NEW HAV	CT	Intoxication due to the Combined Effects of Methadone and Diphenhydramine											Y								Y		Accident
5/2/2014	27	Male		HAMDEN			NEW HAV	NEW HAV	Hospital		Ingestion	Residence				Intoxication due to the combined effects of Oxycodone, Oxyn						Y		Y											Accident
10/7/2016	34	Male	White	COS COB	FAIRFIELD	CT	COS COB		Residence		Substance	Residence	COS COB			Acute Intoxication d		Y		Y														Y		Accident
7/16/2016	27	Female	White	STRATFOR	FAIRFIELD	CT	STRATFORD		Residence		Substance	Residence	STRATFORD			Acute Intoxication d		Y		Y														Y		Accident
##########	25	Male	White	MERIDEN	NEW HAV	CT	MERIDEN	NEW HAV	Hospital		Substance	Residence	MERIDEN	NEW HAV	CT	ACUTE COMBINED HI		Y	Y	Y	Y															Accident
2/10/2018	51	Male	White	HARTFORI	HARTFORI	CT	HARTFORI	HARTFORI	Hospital		Drug Use	Other, Pul	HARTFORI	HARTFORD		Acute IntoxicationCombined Effects of Et		Y		Y					Y										Y		Accident
4/12/2015	23	Male	White	DANBURY	FAIRFIELD	CT	DANBURY	FAIRFIELD	Other			Other				Heroin and Ethanol I		Y							Y										Accident
2/27/2015	35	Male	White	NEW BRIT	HARTFORI	CT	HARTFORI	HARTFORI	Hospital			Restaurant				Acute Fentanyl Toxicity				Y														Y		Accident
4/11/2018	25	Male	Hispanic, '	HARRISBU	DAUPHIN	PA	NEW HAV	NEW HAV	Nursing Home			Substance	Unknown			Complications of Anoxic-Ischemic EncephalopathyAcute Opioid Intoxication																		Y	Y	Accident
5/10/2016	43	Male	White	MELROSE	MIDDLESE	MA	ENFIELD		Other	Motel 6	substance	Hotel or M	ENFIELD			Acute Heroin, Fentai		Y	Y	Y				Y		Y								Y		Accident
12/4/2013	48	Male	White	NORTH SA	WESTCHESTER		NORWALK	FAIRFIELD	Hospital		substance	Unknown				Acute intoxication d		Y						Y		Y									Accident
6/18/2018	40	Female	White	TORRINGT	LITCHFIEL	CT	TORRINGT	LITCHFIEL	Residence		Substance	Residence	TORRINGT	LITCHFIELD		ACUTE CO RECENT C		Y	Y	Y				Y										Y		Accident
5/9/2018	49	Female	White	SOUTHBU	NEW HAV	CT	WATERBU	NEW HAV	Hospital		Drug abus	In Vehicle				Multidrug Toxicity Including Et		Y						Y											Accident
##########	40	Male	Black	NEW HAV	NEW HAV	CT	NEW HAV	NEW HAV	Hospital		Substance	Residence	NEW HAV	NEW HAV	CT	Acute Intoxication Fi		Y	Y	Y				Y												Accident
9/14/2015	51	Male	White	MIDDLETC	MIDDLESE	CT	MIDDLETC	MIDDLESE	Residence			Residence	MIDDLETC	MIDDLESE	CT	Acute Intoxication ethanol, hydrocodone, and benzodiazepines								Y	Y	Y								Y		Accident
##########	25	Male	White	DARIEN			NORWALK	FAIRFIELD	Hospital		Drug Use	Residence				Intoxication due to t		Y						Y											Accident
6/28/2015	55	Female	White	SAUGUS	ESSEX	MA	MASHANT	NEW LONI	Other			Unknown				ethanol, clonazepam																			Accident
12/7/2015	56	Male	Black	WATERBU	NEW HAV	CT	WATERBU	NEW HAV	Hospital			Residence	WATERBU	NEW HAV	CT	acute Cocaine, CV disease			Y																	accident
##########	39	Male	White	MERIDEN	NEW HAV	CT	MERIDEN	NEW HAV	Other	Hotel/Mo	Substance	Hotel or M	MERIDEN	NEW HAV	CT	Acute Intoxication d		Y		Y				Y											Accident
1/4/2015	28	Male	White	MILFORD	NEW HAV	CT	MILFORD	NEW HAV	Residence			Residence				Acute intoxication d		Y							Y	Y								Y		Accident
8/6/2013	35	Female	White	BRISTOL	HARTFORD		BRISTOL	HARTFORI	Residence		Substance	Residence				Acute Cocaine and M		Y	Y																Accident
2/21/2018	34	Male	White	GUILFORD	NEW HAV	CT	NEW HAV	NEW HAV	Hospital		Toxic effe	Residence	GUILFORD	NEW HAVEN		Fentanyl Toxicity				Y														Y		Accident
7/11/2016	23	Male	White	SOMERS	TOLLAND	CT	SOMERS		Residence		Substance	Residence	SOMERS			Acute Fentanyl and I		Y		Y														Y		Accident
1/1/2018	39	Male	White	WALLINGF	NEW HAV	CT	MERIDEN	NEW HAV	Hospital		Took med	Residence	WALLINGF	NEW HAVEN		Acute Intoxication due to the Combined Effects of Methadone, Buprenorphine, an								Y			Y				Bupren		Y		Accident
4/22/2014	49	Female	Hispanic, '	STAMFORD			STAMFORD		Residence		Substance	Residence				Combined Cocaine, Methadon		Y								Y	Y								Accident
2/7/2015	49	Male	White	NEW BRIT	HARTFORI	CT	NEW BRIT	HARTFORI	Hospital			Residence				Intoxication due to the combin		Y		Y						Y								Y		Accident
##########	50	Male	Hispanic, '	WINDHAM	WINDHAM		WILLIMAN	WINDHAM	Other	Park	Injection	Public Park				Multiple Drug Toxici		Y						Y											Accident
##########	49	Male	White	WATERTO	LITCHFIEL	CT	WATERTO	LITCHFIEL	Residence		Took drug	Residence	WATERTO	LITCHFIELD		Acute Diffi Chronic cocaine use											Y							Y		Accident
9/5/2016	30	Male	White	BALTIC	NEW LONI	CT	BALTIC		Other	Friend's H	Substance	Other	BALTIC			Acute Intoxication fr		Y				Y												Y		Accident
##########	67	Female	White	LITCHFIELD			HARTFORI	HARTFORI	Hospital		Ingestion	Residence				Intoxication due to the combined effects of Diazepam, Oxazepam, Temazepam, Carisoprodol, and Tram												Y						Y		Accident
9/22/2018	36	Male	Hispanic, '	MIDDLETC	MIDDLESE	CT	NEW BRIT	HARTFORI	Hospital		Drug Use	Residenti	NEW BRIT	HARTFORD		Acute Intoxication Combined Effects of O		Y		Y																Y		Accident
5/20/2012	54	Male	White	RIDGEFIEL	FAIRFIELD		RIDGEFIEL	FAIRFIELD	Residence		Used Met	Residence				Methadone and Ethanol Toxicities								Y			Y								Accident
11/7/2016	43	Male	White	EASTON	FAIRFIELD	CT	NEW HAVEN		Other	Outside	Drug Use	Other, Oth	NEW HAVEN			Acute Intoxication C		Y	Y	Y		Y		Y		Y								Y		Accident
8/13/2015	25	Male	White	DERBY	NEW HAV	CT	DERBY	NEW HAV	Other			Public Park				Acute Combined Oxycodone, Benzodiazepine, Mirtazapine, Di						Y		Y		Y								Y		Accident

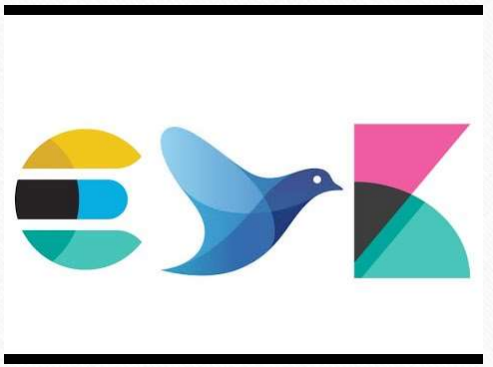


Introduction

- The objective of the study is to analyze, understand, and predict the type of drugs that cause and will cause the most accidental deaths by making use of the data collected from the state of Connecticut

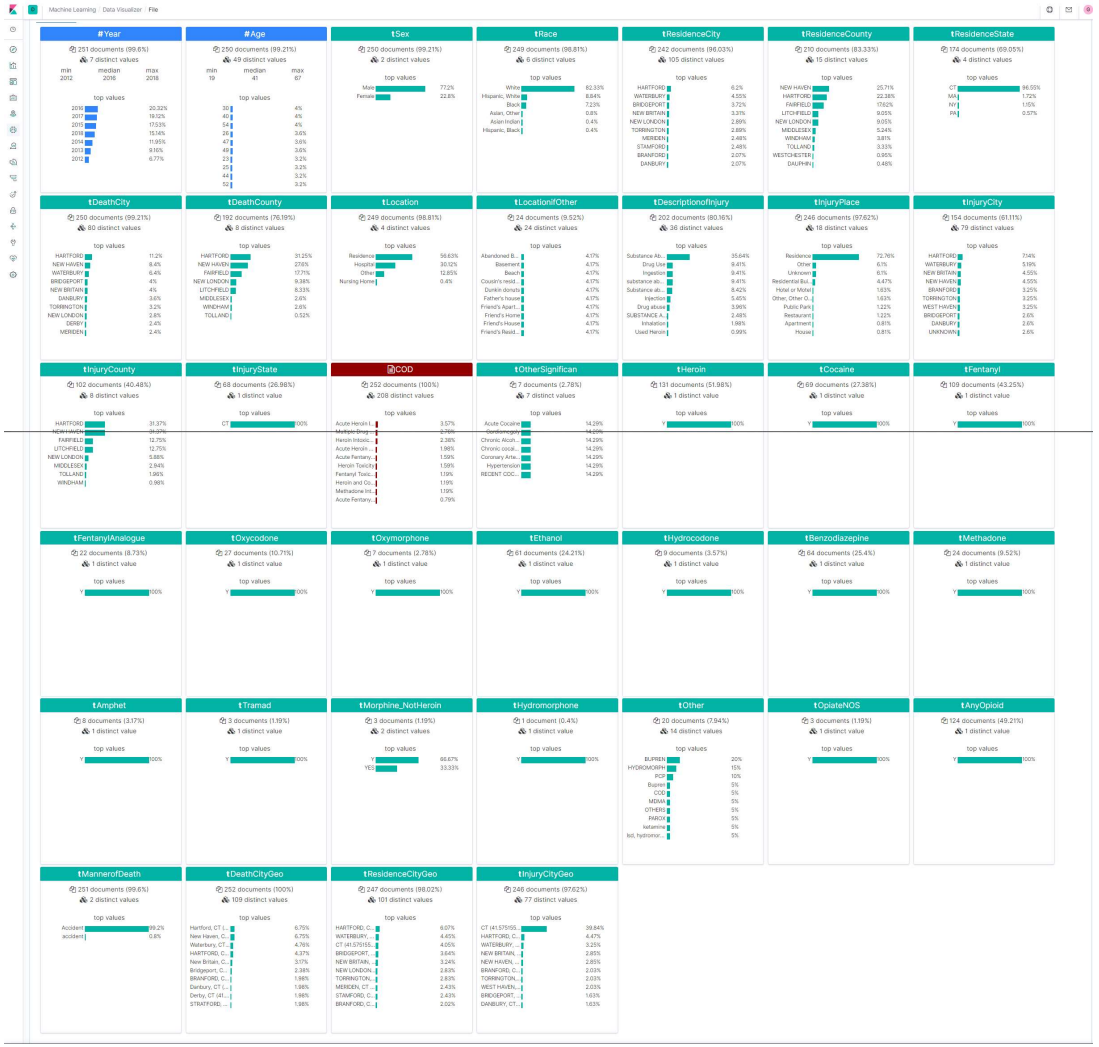
Main Work

- Using Elastic Cloud and Kibana we created visualization of the content of the data, that allow us to see and compare some of the important information that is being convey. The data contain information about the people that die due to drug overdhose.

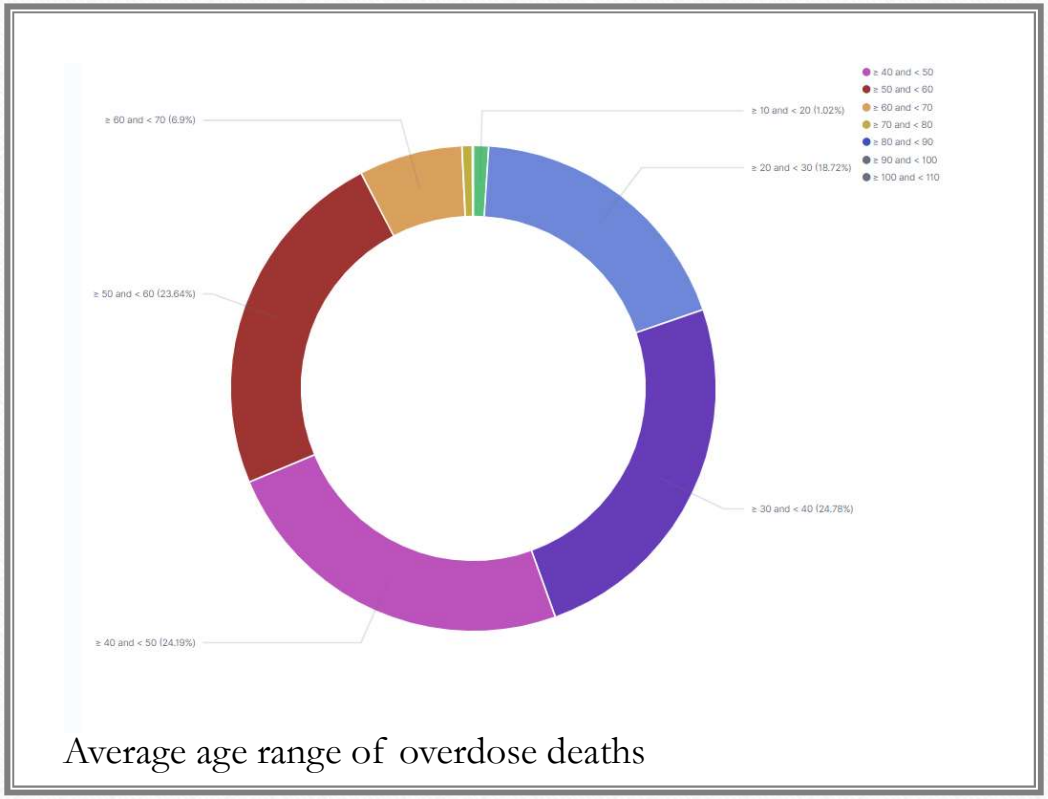


Elastic/Kibana Implementation

- Using elastic we can visualize graphs of data in a visual manner which allow to understand the information that is collected in a more simplistic manner.

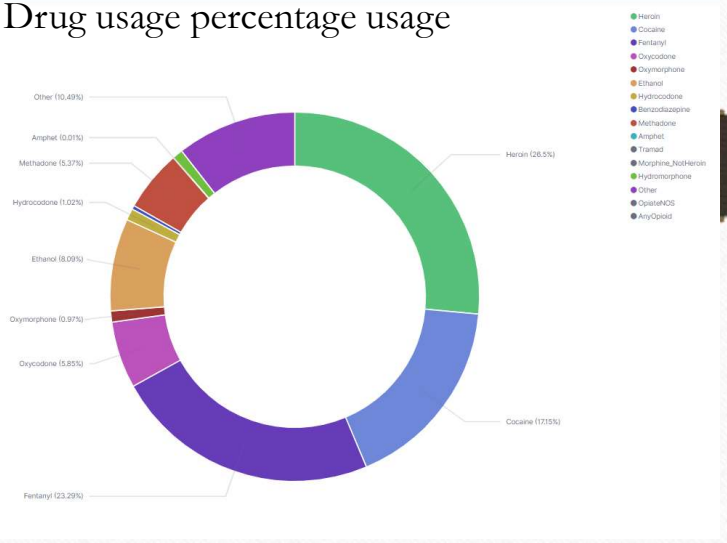


Visuals



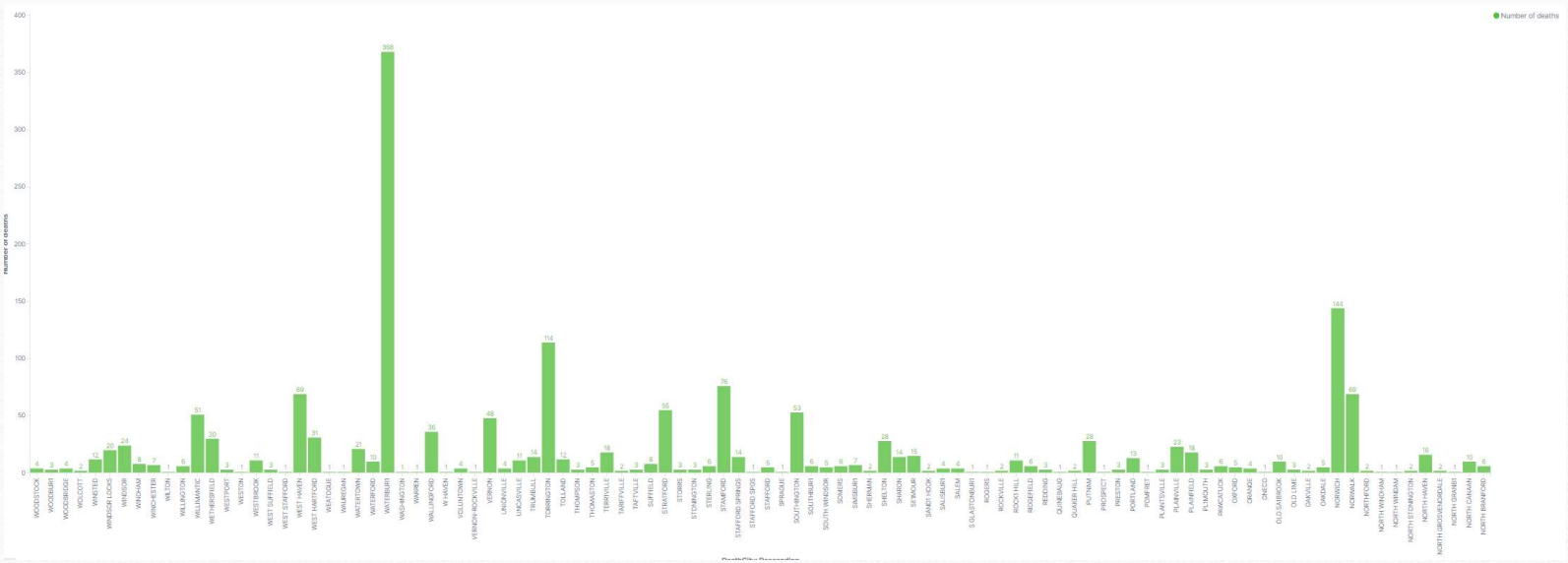
Average age range of overdose deaths

Drug usage percentage usage



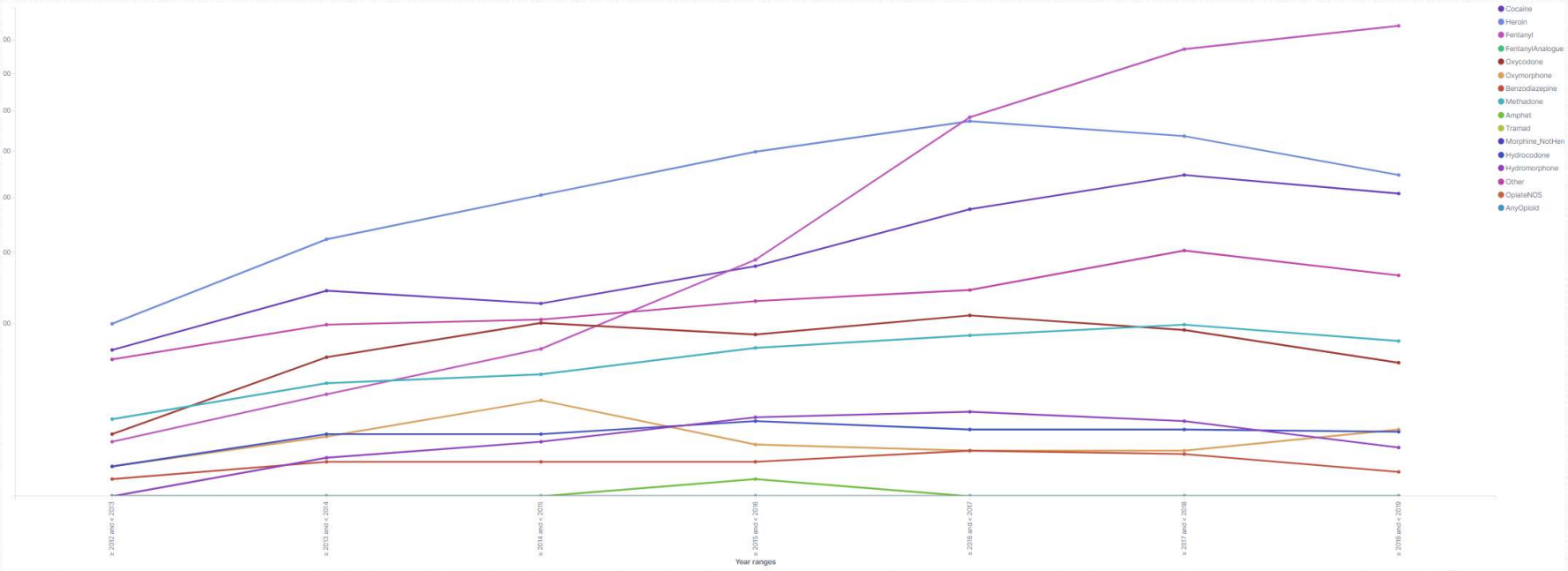
Visuals

Number of death per city on Connecticut

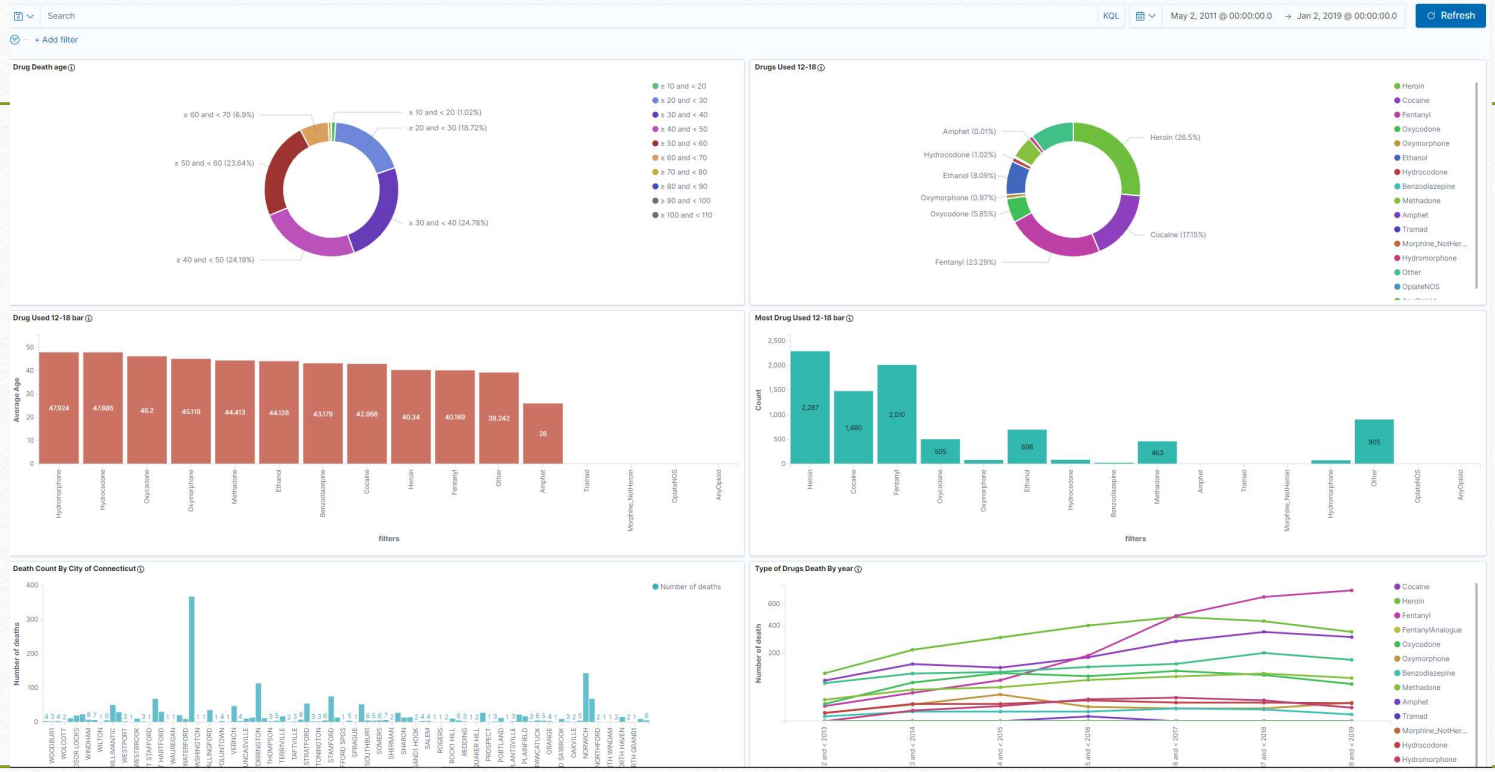

Number of deaths
Number of deaths
400
350
300
250
200
150
100
50
0
4 3 4 2 12 20 24 8 7 1 6 51 30 3 1 11 3 1 69 31 1 1 21 10 368 1 1 39 1 4 1 49 4 11 14 114 12 3 5 18 2 3 8 55 3 3 6 76 14 1 5 1 53 6 5 6 7 2 28 14 16 2 4 4 1 1 2 11 6 3 1 2 28 1 3 16 1 3 23 18 4 6 5 4 1 10 3 2 5 144 69 2 1 1 2 16 1 1 10 6
WOODSTOCK
WOODBURY
WOODBRIDGE
WOLCOTT
WINSTED
WINDSOR LOCKS
WINDSOR
WINDHAM
WINCHESTER
WILTON
WILLINGTON
WILLIMANTIC
WETHERSFIELD
WESTPORT
WESTON
WESTBROOK
WEST SUFFIELD
WEST STAFFORD
WEST HAVEN
WEST HARTFORD
WESTGUILE
WALLINGFORD
WATERTOWN
WATERFORD
WATERBURY
WASHINGTON
WARREN
WALLINGFORD
W HAVEN
VOLUNTOWN
VERNON-ROCKVILLE
VERNON
UNIONVILLE
UNCASVILLE
TRUMBULL
TORRINGTON
TOLLAND
THOMPSON
THOMASTON
TERRYVILLE
TARIFVILLE
TAFTVILLE
SUFFIELD
STRATFORD
STORRS
STONINGTON
STERLING
STAMFORD
STAFFORD SPRINGS
STAFFORD SPGS
STAFFORD
SPRAGUE
SOUTHINGTON
SOUTHBURY
SOUTH WINDSOR
SOMERS
SIMSBURY
SHERMAN
SHELTON
SHARON
SEYMOUR
SANDY HOOK
SALISBURY
SALEM
S GLASTONBURY
ROXBURY
ROCKVILLE
ROCKY HILL
RIDGEFIELD
REDDING
QUINEBAUG
QUAKER HILL
PUTNAM
PROSPECT
PRESTON
PORTLAND
POMFRET
PLANTSVILLE
PLAINVILLE
PLAINFIELD
PLAINFIELD
PLAINFIELD

Visuals

Increase and decrease of drugs usage from 2012-2018



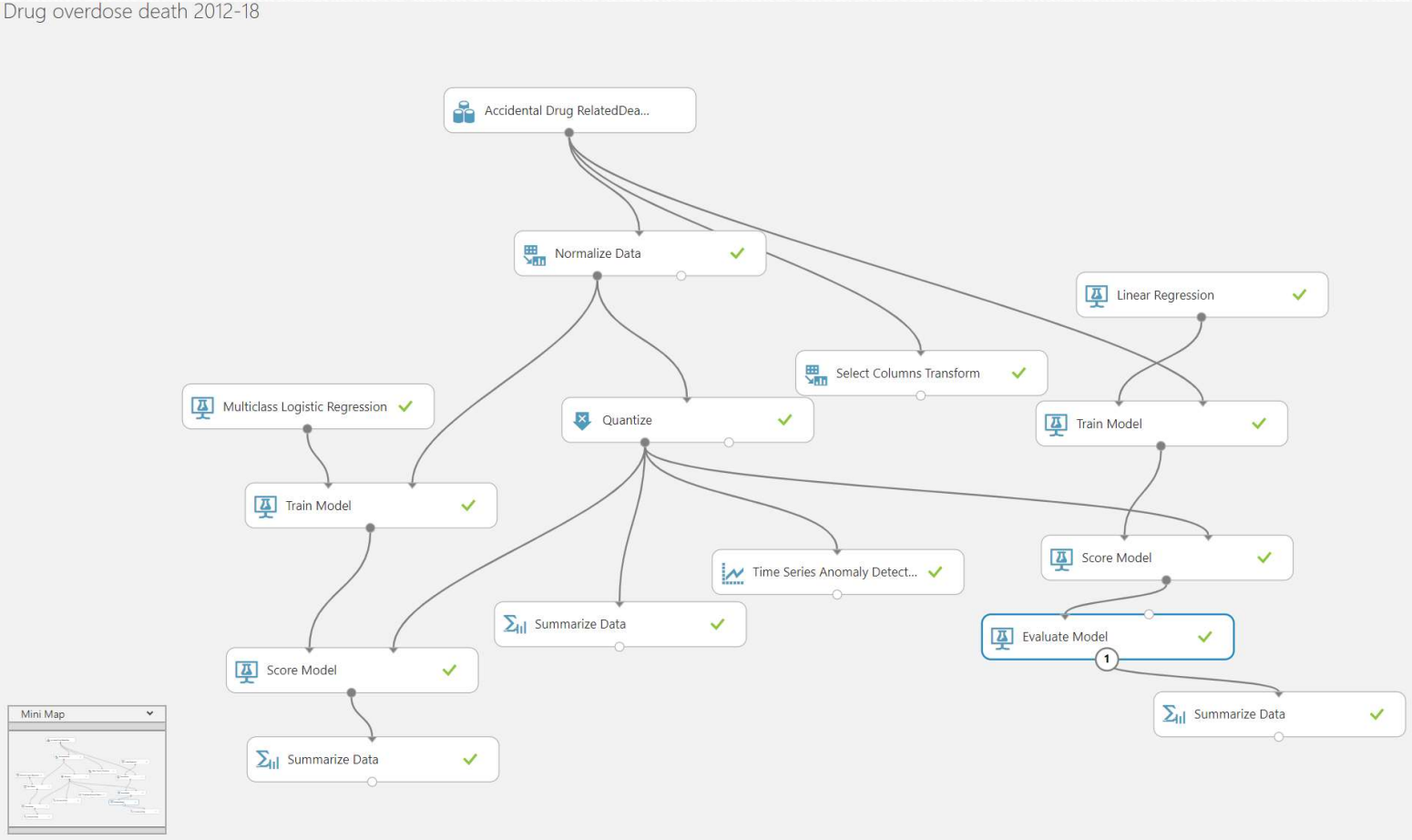
Dashboard


Search
KQL
May 2, 2011 @ 00:00:00.0
Jan 2, 2019 @ 00:00:00.0
Refresh
+ Add filter
Drug Death age
≥ 60 and < 70 (6.9%)
≥ 10 and < 20 (1.02%)
≥ 20 and < 30 (18.72%)
≥ 50 and < 60 (23.64%)
≥ 30 and < 40 (24.78%)
≥ 40 and < 50 (24.19%)
≥ 10 and < 20
≥ 20 and < 30
≥ 30 and < 40
≥ 40 and < 50
≥ 50 and < 60
≥ 60 and < 70
≥ 70 and < 80
≥ 80 and < 90
≥ 90 and < 100
≥ 100 and < 110
Drugs Used 12-18
Amphet (0.01%)
Hydrocodone (1.02%)
Ethanol (8.09%)
Oxymorphone (0.97%)
Oxycodone (5.85%)
Heroin (26.5%)
Cocaine (17.15%)
Fentanyl (23.29%)
Heroin
Cocaine
Fentanyl
Oxycodone
Oxymorphone
Ethanol
Hydrocodone
Benzodiazepine
Methadone
Amphet
Tramad
Morphine_NotHer...
Hydromorphone
Other
OpiateNOS
Drug Used 12-18 bar
Average Age
47.924
47.886
46.2
45.119
44.413
44.128
43.179
42.968
40.34
40.189
39.242
26
Hydromorphone
Hydrocodone
Oxycodone
Oxymorphone
Methadone
Ethanol
Benzodiazepine
Cocaine
Heroin
Fentanyl
Other
Amphet
Tramad
Morphine_NotHeroin
OpiateNOS
AnyOpioid
filters
Most Drug Used 12-18 bar
Count
2,287
1,480
2,010
505
698
463
905
Heroin
Cocaine
Fentanyl
Oxycodone
Oxymorphone
Ethanol
Hydrocodone
Benzodiazepine
Methadone
Amphet
Tramad
Morphine_NotHeroin
Hydromorphone
Other
OpiateNOS
AnyOpioid
filters
Death Count By City of Connecticut
Number of deaths
Number of deaths
Type of Drugs Death By year
Number of death
Cocaine
Heroin
Fentanyl
FentanylAnalogue
Oxycodone
Oxymorphone
Benzodiazepine
Methadone
Amphet
Tramad
Morphine_NotHer...
Hydrocodone
Hydromorphone

Azure Implementations

- In Azure we made used of Linear Regression which is type of regression analysis where the number of independent variables is one and there is a linear relationship between the independent and dependent variable. Decision tree model is very good at handling tabular data with numerical features, or categorical features with fewer than hundreds of categories.
- With it apply we scored the dataset as get the values that would represent the prediction of future. As it takes the frequency of the data list rows with similar score and indicates the likelihood of it being part of the same type.

Drug overdose death 2012-18



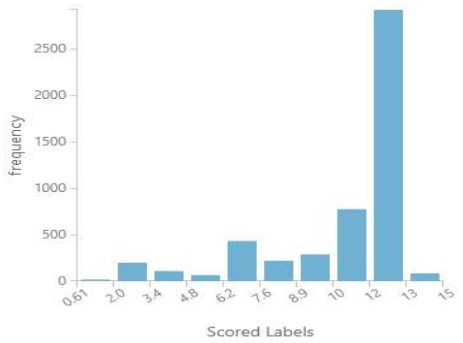
Statistics

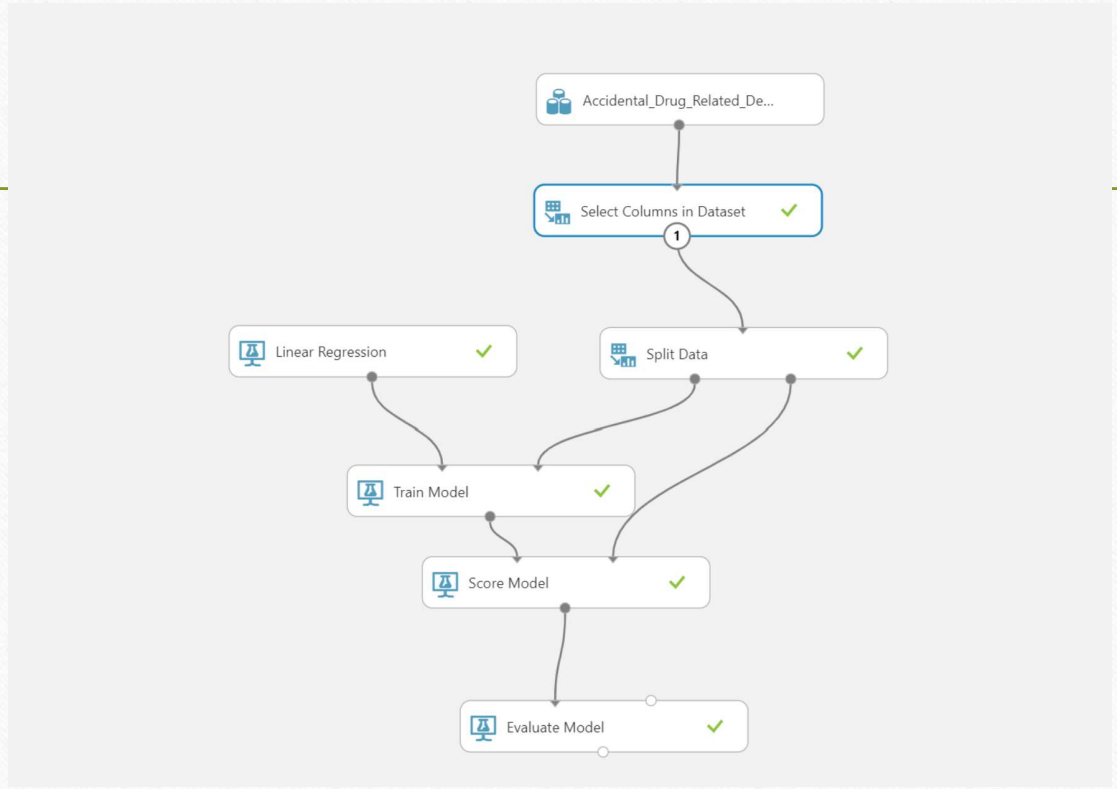
Mean	10.6819
Median	11.871
Min	0.6087
Max	14.5061
Standard Deviation	2.6471
Unique Values	5104
Missing Values	0
Feature Type	Numeric Score

Visualizations

Scored Labels

Histogram

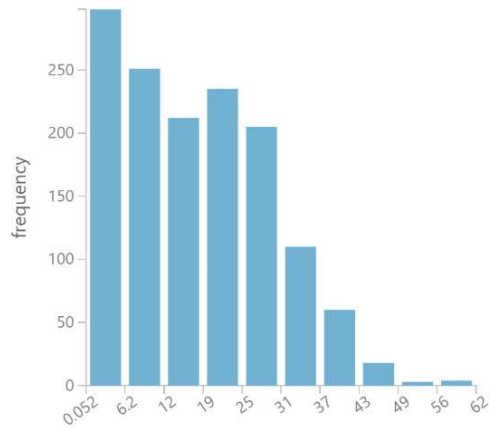



Accidental_Drug_Related_De...
Select Columns in Dataset
1
Linear Regression
Split Data
Train Model
Score Model
Evaluate Model

Accidental Drug Related Deaths › Evaluate Model › Evaluation results

Root Mean Squared Error	21.107992
Relative Absolute Error	1.662975
Relative Squared Error	2.912126
Coefficient of Determination	-1.912126

Error Histogram

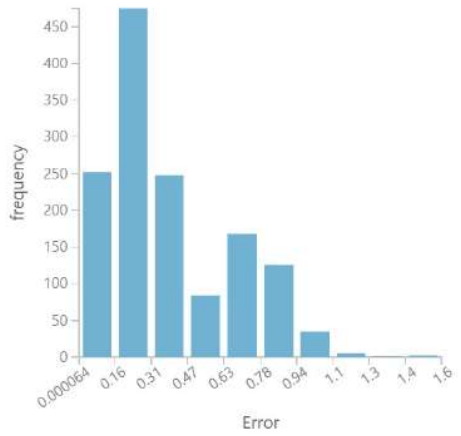


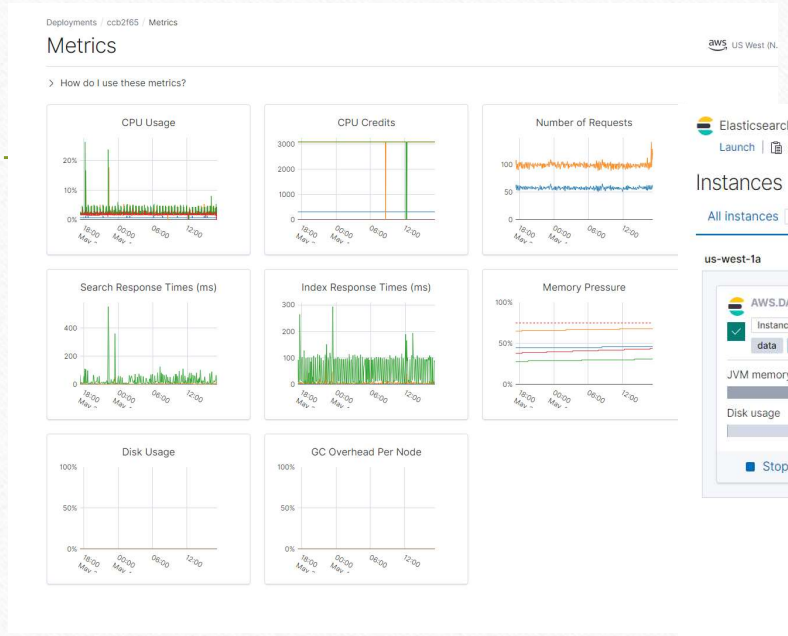
Accidental Drug Related Death › Evaluate Model › Evaluation results

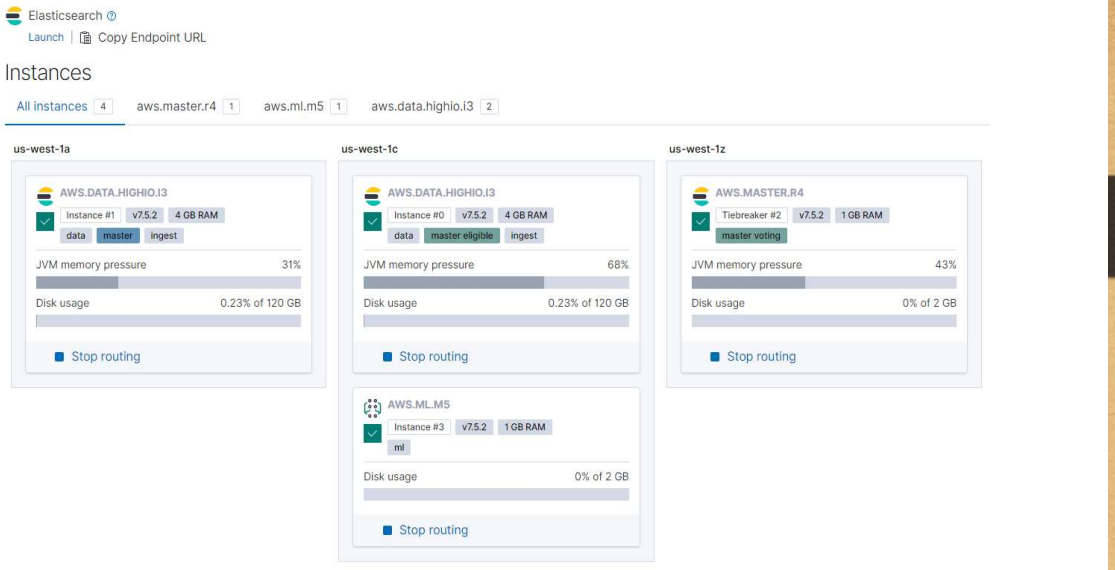
Metrics

Mean Absolute Error	0.389218
Root Mean Squared Error	0.47344
Relative Absolute Error	1.0033
Relative Squared Error	1.150214
Coefficient of Determination	-0.150214

Error Histogram




Deployments / ccb2f65 / Metrics
Metrics
US West (N.
How do I use these metrics?
CPU Usage
CPU Credits
Number of Requests
Search Response Times (ms)
Index Response Times (ms)
Memory Pressure
Disk Usage
GC Overhead Per Node


Elasticsearch
Launch | Copy Endpoint URL
Instances
All instances 4
aws.master.r4 1
aws.ml.m5 1
aws.data.highio.i3 2
us-west-1a
AWS.DATA.HIGHIO.I3
Instance #1 v7.5.2 4 GB RAM
data master ingest
JVM memory pressure 31%
Disk usage 0.23% of 120 GB
Stop routing
us-west-1c
AWS.DATA.HIGHIO.I3
Instance #0 v7.5.2 4 GB RAM
data master eligible ingest
JVM memory pressure 68%
Disk usage 0.23% of 120 GB
Stop routing
AWS.ML.M5
Instance #3 v7.5.2 1 GB RAM
ml
Disk usage 0% of 2 GB
Stop routing
us-west-1z
AWS.MASTER.R4
Tiebreaker #2 v7.5.2 1 GB RAM
master voting
JVM memory pressure 43%
Disk usage 0% of 2 GB
Stop routing

Kibana Dashboard

- https://d39a26931e4747399a5bee5f8fd0c1b5.us-west-1.aws.found.io:9243/app/kibana#/dashboard/bb739dd0-8a73-11ea-8a60-832e84ee957d?_g=()&_a=(description:'',filters:!(),fullScreenMode:!f,options:(hidePanelTitles:!f,useMargins:!t),panels:!((embeddableConfig:(title:'Drug+Used+12-18+bar',vis:(legendOpen:!f)),gridData:(h:15,i:ea4471ac-a988-4c62-91cf-0f9e249b5b7d,w:24,x:0,y:15),id:'1ea8b970-8732-11ea-8a60-832e84ee957d',panelIndex:ea4471ac-a988-4c62-91cf-0f9e249b5b7d,title:'Drug+Used+12-18+bar',type:visualization,version:'7.5.2'),(embeddableConfig:(),gridData:(h:15,i:aefdfcb9-c063-40a6-bae2-8c11048eefa8,w:24,x:24,y:0),id:'042cbed0-8731-11ea-8a60-832e84ee957d',panelIndex:aefdfcb9-c063-40a6-bae2-8c11048eefa8,type:visualization,version:'7.5.2'),(embeddableConfig:(),gridData:(h:15,i:b048a106-48f0-460a-9ab0-b33821b32eba,w:24,x:0,y:30),id:'2a9c6010-8a66-11ea-8a60-832e84ee957d',panelIndex:b048a106-48f0-460a-9ab0-b33821b32eba,type:visualization,version:'7.5.2'),(embeddableConfig:(legendOpen:!t,vis:(legendOpen:!f)),gridData:(h:15,i:'7e5c243f-92f1-45f8-9b35-2545b079bb27',w:24,x:24,y:15),id:'30dea8d0-8a65-11ea-8a60-832e84ee957d',panelIndex:'7e5c243f-92f1-45f8-9b35-2545b079bb27',type:visualization,version:'7.5.2'),(embeddableConfig:(),gridData:(h:15,i:'81fae6fd-8227-4fa6-814c-dcf0f5893987',w:24,x:0,y:45),id:'9ae0f3c0-8a72-11ea-8a60-832e84ee957d',panelIndex:'81fae6fd-8227-4fa6-814c-dcf0f5893987',type:visualization,version:'7.5.2'),(embeddableConfig:(),gridData:(h:15,i:'4d39c1d0-5001-4171-ace5-385a1ebcd259',w:24,x:24,y:30),id:'4fd47980-8a6b-11ea-8a60-832e84ee957d',panelIndex:'4d39c1d0-5001-4171-ace5-385a1ebcd259',type:visualization,version:'7.5.2'),(embeddableConfig:(),gridData:(h:15,i:'15907da2-b053-4558-bfcb-e44ec7ce528d',w:24,x:0,y:0),id:e4f63990-8a75-11ea-8a60-832e84ee957d,panelIndex:'15907da2-b053-4558-bfcb-e44ec7ce528d',type:visualization,version:'7.5.2')),query:(language:kuery,query:''),timeRestore:!f,title:'Drugs+Death+Overdose+Connecticut+2012-18',viewMode:view)