

Appendix A

List of variables based on sales data.

Variable Name	Description	Number of Variables
spike	binary variable to represent spikes in sale 1 = daily sale higher than 1.5*average daily sale 0 = otherwise	1
sale_pp	daily sale per customer	1
cloth	daily sale in materials	5
gauze		
heating/moisturizing		
nonwoven		
urethane		
cloth_share	daily share of sale in materials	5
gauze_share		
heating/moisturizing_share		
nonwoven_share		
urethane_share		
bigger	daily sale in sizes	5
kids		
other		
regular		
smaller		
bigger_share	daily share of sale in sizes	5
kids_share		
other_share		
regular_share		
smaller_share		
no	daily sale in design no: plain masks; yes: prints or/and color on masks	2
yes		
no_share	daily share of sale in design no: plain masks; yes: prints or/and color on masks	2
yes_share		
price_per_unit	daily average price per unit	1
over_thirty_package_number	number of sold package by sizes of package	4
ten_thirty_package_number		
three_ten_package_number		
zero_three_package_number		
Brand0-47	binary manufacturers	48
pct daily sale in materials	daily percentage change	5
pct daily share of sale in materials		5
pct daily sale in sizes		5
pct daily share of sale in sizes		5

pct daily sale in design		2
pct daily share of sale in design		2
pct daily average price per unit		1
pct number of sold package by sizes of package		4
Lag1 daily sale in materials	lag 1	5
Lag1 daily share of sale in materials		5
Lag1 daily sale in sizes		5
Lag1 daily share of sale in sizes		5
Lag1 daily sale in design		2
Lag1 daily share of sale in design		2
Lag1 daily average price per unit		1
Lag1 number of sold package by sizes of package		4
Lag1 binary manufacturers		48
Lag2 daily sale in materials	lag 2	5
Lag2 daily share of sale in materials		5
Lag2 daily sale in sizes		5
Lag2 daily share of sale in sizes		5
Lag2 daily sale in design		2
Lag2 daily share of sale in design		2
Lag2 daily average price per unit		1
Lag2 number of sold package by sizes of package		4
Lag2 binary manufacturers		48
Lag3 daily sale in materials	lag 3	5
Lag3 daily share of sale in materials		5
Lag3 daily sale in sizes		5
Lag3 daily share of sale in sizes		5
Lag3 daily sale in design		2
Lag3 daily share of sale in design		2
Lag3 daily average price per unit		1
Lag3 number of sold package by sizes of package		4
Lag3 binary manufacturers		48
DiffLag1 daily sale in materials	difference between lag 1 values and current values	5
DiffLag1 daily share of sale in materials		5
DiffLag1 daily sale in sizes		5
DiffLag1 daily share of sale in sizes		5
DiffLag1 daily sale in design		2
DiffLag1 daily share of sale in design		2
DiffLag1 daily average price per unit		1
DiffLag1 number of sold package by sizes of package		4
DiffLag2 daily sale in materials		5

DiffLag2 daily share of sale in materials	difference between lag 2 values and current values	5
DiffLag2 daily sale in sizes		5
DiffLag2 daily share of sale in sizes		5
DiffLag2 daily sale in design		2
DiffLag2 daily share of sale in design		2
DiffLag2 daily average price per unit		1
DiffLag2 number of sold package by sizes of package		4
DiffLag3 daily sale in materials	difference between lag 3 values and current values	5
DiffLag3 daily share of sale in materials		5
DiffLag3 daily sale in sizes		5
DiffLag3 daily share of sale in sizes		5
DiffLag3 daily sale in design		2
DiffLag3 daily share of sale in design		2
DiffLag3 daily average price per unit		1
DiffLag3 number of sold package by sizes of package		4
Roll3 daily sale in materials	rolling windows (3) mean calculate the mean of the previous 3 days as the 3rd day's value	5
Roll3 daily share of sale in materials		5
Roll3 daily sale in sizes		5
Roll3 daily share of sale in sizes		5
Roll3 daily sale in design		2
Roll3 daily share of sale in design		2
Roll3 daily average price per unit		1
Roll3 number of sold package by sizes of package		4
DiffRoll3 daily sale in materials	difference between rolling window means and current values	5
DiffRoll3 daily share of sale in materials		5
DiffRoll3 daily sale in sizes		5
DiffRoll3 daily share of sale in sizes		5
DiffRoll3 daily sale in design		2
DiffRoll3 daily share of sale in design		2
DiffRoll3 daily average price per unit		1
DiffRoll3 number of sold package by sizes of package		4
Total:		484

Appendix B

List of variables based on topics data.

Variable Name	Description	Number of Variables
/art and entertainment/comics and animation	occurrence 1 = topics occurred 0 = topics not occurred	303
/art and entertainment/comics and animation/anime and manga		
/art and entertainment/comics and animation/cartoons		
/art and entertainment/comics and animation/comics		
/art and entertainment/dance		
/art and entertainment/dance/pole dancing		
/art and entertainment/movies		
/art and entertainment/movies and tv		
/art and entertainment/movies and tv/action		
/art and entertainment/movies and tv/children's		
/art and entertainment/movies and tv/movies		
/art and entertainment/movies and tv/movies/reviews		
/art and entertainment/movies and tv/talk shows		
/art and entertainment/movies and tv/television		
/art and entertainment/music/music reference		
/art and entertainment/music/recording industry		
/art and entertainment/music/recording industry/music awards		
/art and entertainment/music/singing		
/art and entertainment/radio		
/art and entertainment/shows and events		
/art and entertainment/shows and events/circus		
/art and entertainment/shows and events/classical concert		
/art and entertainment/shows and events/concert		
/art and entertainment/shows and events/exhibition		
/art and entertainment/shows and events/festival		
/art and entertainment/shows and events/sports event		
/automotive and vehicles		
/automotive and vehicles/auto parts		
/automotive and vehicles/auto repair		
/automotive and vehicles/bicycles and accessories		
/automotive and vehicles/bicycles and accessories/mountain bikes		
/automotive and vehicles/buying and selling cars		
/automotive and vehicles/cars		
/automotive and vehicles/cars/car culture		
/automotive and vehicles/cars/convertible		
/automotive and vehicles/cars/coupe		
/automotive and vehicles/cars/crossover		
/automotive and vehicles/cars/hatchback		

/automotive and vehicles/cars/hybrid		
/automotive and vehicles/cars/luxury		
/automotive and vehicles/cars/performance vehicles		
/automotive and vehicles/cars/sedan		
/automotive and vehicles/cars/vintage cars		
/automotive and vehicles/cars/wagon		
/automotive and vehicles/electric vehicles		
/automotive and vehicles/motor shows		
/automotive and vehicles/motorcycles		
/automotive and vehicles/road-side assistance		
/automotive and vehicles/vehicle brands		
/automotive and vehicles/vehicle brands/acura		
/automotive and vehicles/vehicle brands/honda		
/automotive and vehicles/vehicle brands/nissan		
/automotive and vehicles/vehicle brands/nissan/infiniti		
/automotive and vehicles/vehicle brands/toyota		
/business and industrial		
/business and industrial/advertising and marketing		
/business and industrial/advertising and marketing/advertising		
/business and industrial/advertising and marketing/brand management		
/business and industrial/advertising and marketing/marketing		
/business and industrial/agriculture and forestry/agriculture		
/business and industrial/agriculture and forestry/crops and seed		
/business and industrial/business news		
/business and industrial/business operations		
/business and industrial/business operations/business plans		
/business and industrial/business operations/human resources/compensation and benefits		
/business and industrial/business operations/human resources/payroll services		
/business and industrial/business operations/management/business process		
/business and industrial/business software		
/business and industrial/company		
/business and industrial/company/bankruptcy		
/business and industrial/company/earnings		
/business and industrial/company/merger and acquisition		
/business and industrial/energy		
/business and industrial/energy/electricity		
/business and industrial/energy/nuclear power		
/business and industrial/energy/nuclear power/nuclear accident		
/business and industrial/energy/renewable energy		
/business and industrial/energy/renewable energy/solar energy		
/business and industrial/energy/renewable energy/wind energy		
/business and industrial/green solutions		

/business and industrial/metals		
/business and industrial/paper industry		
/business and industrial/record company		
/business and industrial/war industry		
/business and industrial/war industry/weaponry		
/careers/career planning		
/education		
/education/homework and study tips		
/education/studying business		
/education/teaching and classroom resources		
/education/teaching and classroom resources/school supplies		
/family and parenting		
/family and parenting/adoption		
/family and parenting/babies and toddlers		
/family and parenting/babies and toddlers/baby clothes		
/family and parenting/babies and toddlers/baby food		
/family and parenting/children		
/family and parenting/children/daycare and preschool		
/family and parenting/parenting teens		
/finance/bank		
/finance/bank/atms		
/finance/bank/checks		
/finance/financial news		
/finance/grants, scholarships and financial aid		
/finance/grants, scholarships and financial aid/government grants		
/finance/investing		
/finance/investing/beginning investing		
/finance/investing/day trading		
/finance/investing/funds		
/finance/investing/funds/exchange traded funds		
/finance/investing/funds/mutual funds		
/food and drink		
/food and drink/barbecues and grilling		
/food and drink/beverages		
/food and drink/beverages/alcoholic beverages		
/food and drink/beverages/alcoholic beverages/cocktails and beer		
/food and drink/beverages/non alcoholic beverages/coffee and tea		
/food and drink/beverages/non alcoholic beverages/soft drinks		
/food and drink/cuisines		
/food and drink/cuisines/american cuisine		
/food and drink/cuisines/chinese cuisine		
/food and drink/cuisines/japanese cuisine		
/food and drink/cuisines/regional cuisine		
/food and drink/desserts and baking		
/food and drink/food		

/food and drink/food allergies		
/food and drink/food/breakfast foods		
/food and drink/food/candy and sweets		
/food and drink/food/condiments and dressings		
/food and drink/food/fast food		
/food and drink/food/grains and pasta		
/food and drink/food/herbs and spices		
/food and drink/food/salads		
/food and drink/health and low-fat cooking		
/food and drink/healthy eating		
/food and drink/vegetarian		
/health and fitness		
/health and fitness/addiction		
/health and fitness/addiction/alcoholism		
/health and fitness/dental care		
/health and fitness/disease		
/health and fitness/disease/aids and hiv		
/health and fitness/disease/allergies		
/health and fitness/disease/cholesterol		
/health and fitness/disease/cold and flu		
/health and fitness/disease/diabetes		
/health and fitness/disease/epidemic		
/health and fitness/disease/headaches and migraines		
/health and fitness/disease/heart disease		
/health and fitness/disease/infertility		
/health and fitness/disorders		
/health and fitness/disorders/sleep disorders		
/health and fitness/drugs		
/health and fitness/exercise		
/health and fitness/incest and abuse support		
/health and fitness/men's health		
/health and fitness/nutrition		
/health and fitness/sexuality		
/health and fitness/therapy		
/health and fitness/weight loss		
/hobbies and interests/games		
/hobbies and interests/home recording		
/law, govt and politics		
/law, govt and politics/armed forces		
/law, govt and politics/armed forces/army		
/law, govt and politics/government		
/law, govt and politics/government/government contracting and procurement		
/law, govt and politics/government/heads of state		
/law, govt and politics/government/parliament		

/law, govt and politics/immigration		
/law, govt and politics/law enforcement/fire department		
/law, govt and politics/politics		
/law, govt and politics/politics/elections/presidential elections		
/law, govt and politics/politics/foreign policy		
/law, govt and politics/politics/lobbying		
/law, govt and politics/politics/political parties		
/news		
/news/local news		
/news/national news		
/pets		
/pets/birds		
/pets/cats		
/pets/dogs		
/pets/large animals		
/pets/zoo		
/real estate/buying and selling homes		
/religion and spirituality		
/religion and spirituality/alternative religions		
/religion and spirituality/buddhism		
/religion and spirituality/christianity		
/religion and spirituality/judaism		
/science		
/science/biology		
/science/geology		
/science/mathematics		
/science/medicine		
/science/weather		
/science/weather/meteorological disaster		
/shopping		
/shopping/gifts		
/shopping/gifts/flowers		
/shopping/gifts/greeting cards		
/shopping/gifts/party supplies		
/shopping/toys		
/society		
/society/crime/personal offense		
/society/crime/personal offense/assault		
/society/crime/personal offense/homicide		
/society/crime/personal offense/kidnapping		
/society/crime/personal offense/torture		
/society/crime/property crime		
/society/crime/property crime/burglary		
/society/crime/property crime/fraud		
/society/crime/property crime/larceny		

/society/crime/property crime/robbery		
/society/crime/sexual offense/rape		
/society/dating		
/society/gay life		
/society/racism		
/society/senior living		
/society/sex		
/society/sex/pornography		
/society/sex/sex education		
/society/social institution/divorce		
/society/social institution/marriage		
/society/social institution/marriage/common law marriage		
/society/teens		
/society/unrest and war		
/society/work		
/society/work/retirement		
/society/work/unemployment		
/sports/baseball		
/sports/boat racing		
/sports/bodybuilding		
/sports/bowling		
/sports/boxing		
/sports/cricket		
/sports/fencing		
/sports/fishing		
/sports/fishing/freshwater fishing		
/sports/fishing/saltwater fishing		
/sports/go kart		
/sports/hunting and shooting		
/sports/hunting and shooting/skeet shooting		
/sports/hunting and shooting/target shooting		
/sports/olympics		
/sports/scuba diving		
/sports/skating/figure skating		
/sports/sports news		
/sports/walking		
/sports/wrestling		
/style and fashion		
/style and fashion/beauty/hair care		
/style and fashion/body art		
/style and fashion/clothing		
/style and fashion/clothing/pants		
/style and fashion/clothing/pants/jeans		
/style and fashion/clothing/shirts		
/style and fashion/clothing/skirts		

/style and fashion/underwear		
/technology and computing		
/technology and computing/computer certification		
/technology and computing/consumer electronics/tv and video equipment		
/technology and computing/consumer electronics/tv and video equipment/home theater systems		
/technology and computing/consumer electronics/tv and video equipment/televisions/lcd tvs		
/technology and computing/consumer electronics/tv and video equipment/televisions/plasma tvs		
/technology and computing/consumer electronics/tv and video equipment/video players and recorders/blu-ray players and recorders		
/technology and computing/consumer electronics/tv and video equipment/video players and recorders/dvd players and recorders		
/technology and computing/enterprise technology		
/technology and computing/hardware		
/technology and computing/hardware/computer		
/technology and computing/hardware/computer components		
/technology and computing/hardware/computer components/chips and processors		
/technology and computing/hardware/computer components/disks		
/technology and computing/hardware/computer components/graphics cards		
/technology and computing/hardware/computer components/memory		
/technology and computing/hardware/computer components/motherboards		
/technology and computing/hardware/computer components/sound cards		
/technology and computing/hardware/computer peripherals		
/technology and computing/hardware/computer peripherals/computer monitors		
/technology and computing/hardware/computer peripherals/printers, copiers and fax/printers		
/technology and computing/hardware/computer/desktop computer		
/technology and computing/hardware/computer/portable computer		
/technology and computing/hardware/computer/portable computer/laptop		
/technology and computing/hardware/computer/portable computer/tablet		
/technology and computing/internet technology		
/technology and computing/internet technology/internet cafes		
/technology and computing/internet technology/social network		
/technology and computing/internet technology/web search/people search		
/technology and computing/operating systems		
/technology and computing/operating systems/linux		
/technology and computing/operating systems/unix		
/technology and computing/operating systems/windows		
/technology and computing/software		

/technology and computing/software/graphics software		
/technology and computing/tech news		
/travel/business travel		
/travel/honeymoons and getaways		
/travel/transport/road travel		
/travel/transport/road travel/road accident		
/travel/transport/sea travel		
/travel/transport/train travel		
/travel/traveling with kids		
art and entertainment	coverage	164
automotive and vehicles		
business and industrial		
education		
family and parenting		
finance		
food and drink		
health and fitness		
law, govt and politics		
news		
pets		
religion and spirituality		
science		
shopping		
society		
sports		
style and fashion		
technology and computing		
travel		
advertising and marketing		
armed forces		
auto parts		
auto repair		
babies and toddlers		
beverages		
boat racing		
body art		
bowling		
buddhism		
business news		
business operations		
business software		
business travel		
buying and selling cars		
cars		
cats		

children		
clothing		
comics and animation		
company		
crime		
cuisines		
dance		
dating		
desserts and baking		
disease		
dogs		
electric vehicles		
energy		
enterprise technology		
fencing		
financial news		
food		
gifts		
go kart		
government		
green solutions		
hardware		
homework and study tips		
hunting and shooting		
internet technology		
large animals		
motor shows		
movies and tv		
national news		
olympics		
operating systems		
parenting teens		
politics		
senior living		
sex		
sexuality		
shows and events		
social institution		
teaching and classroom resources		
teens		
traveling with kids		
unrest and war		
vegetarian		
vehicle brands		
walking		

war industry		
weather		
weight loss		
work		
zoo		
action		
advertising		
aids and hiv		
anime and manga		
baby clothes		
baby food		
brand management		
breakfast foods		
business plans		
candy and sweets		
car culture		
children's		
chinese cuisine		
circus		
classical concert		
cold and flu		
comics		
computer		
computer components		
computer peripherals		
concert		
condiments and dressings		
convertible		
coupe		
crossover		
daycare and preschool		
divorce		
earnings		
epidemic		
fast food		
foreign policy		
government contracting and procurement		
grains and pasta		
hatchback		
heads of state		
hybrid		
internet cafes		
japanese cuisine		
lobbying		
management		

marketing		
marriage		
meteorological disaster		
movies		
nissan		
nuclear power		
pants		
party supplies		
performance vehicles		
personal offense		
pole dancing		
pornography		
property crime		
regional cuisine		
retirement		
salads		
school supplies		
sedan		
sexual offense		
social network		
sports event		
television		
unemployment		
vintage cars		
wagon		
weaponry		
assault		
business process		
computer monitors		
homicide		
infiniti		
kidnapping		
nuclear accident		
portable computer		
rape		
reviews		
robbery		
sound cards		
pct coverage	percentage change of coverage	164
peak coverage	binary variables to represent peaks of coverage	80
interval peak coverage	numerical variables to represent length of intervals between each peak of coverage	80

Lag1 occurrence	lag 1 of occurrence	303
Lag2 occurrence	lag 2 of occurrence	303
Lag3 occurrence	lag 3 of occurrence	303
Lag1 coverage	lag 1 of coverage	164
Lag2 coverage	lag 2 of coverage	164
Lag3 coverage	lag 3 of coverage	164
DiffLag1 coverage	difference between "Lag1 coverage " and " coverage "	164
DiffLag2 coverage	difference between "Lag2 coverage " and " coverage "	164
DiffLag3 coverage	difference between "Lag3 coverage " and " coverage "	164
Lag1 peak coverage	lag 1 of "peak coverage "	80
Lag2 peak coverage	lag 2 of "peak coverage "	80
Lag3 peak coverage	lag 3 of "peak coverage "	80
Lag1 interval peak coverage	lag 1 of "interval peak coverage "	80
Lag2 interval peak coverage	lag 2 of "interval peak coverage "	80
Lag3 interval peak coverage	lag 3 of "interval peak coverage "	80
DiffLag1 interval peak coverage	difference between "Lag1 interval peak coverage " and "interval peak coverage "	80
DiffLag2 interval peak coverage	difference between "Lag2 interval peak coverage " and "interval peak coverage "	80
DiffLag3 interval peak coverage	difference between "Lag3 interval peak coverage " and "interval peak coverage "	80
Lag1 pct coverage	lag 1 of "pct coverage "	164
Lag2 pct coverage	lag 2 of "pct coverage "	164
Lag3 pct coverage	lag 3 of "pct coverage "	164
Roll3 coverage	rolling windows(3) mean of " coverage " calculate the mean of the previous 3 days as the 3rd day's value	164
DiffRoll3 coverage	difference between "Roll3 coverage " and " coverage "	164
Roll3 interval peak coverage	rolling windows(3) mean of "interval peak coverage " calculate the mean of the previous 3 days as the 3rd day's value	80
DiffRoll3 interval peak coverage	difference between "Roll3 interval peak coverage " and "interval peak coverage "	80
Total:		4384

Appendix C

List of variables based on keywords and sentiment data.

Variable Name	Description	Number of Variables
negative_label_count	daily count of the sentiment label "negative"	1
neutral_label_count	daily count of the sentiment label "neutral"	1
positive_label_count	daily count of the sentiment label "positive"	1
pct negative_label_count	daily percentage change of the count of the sentiment label "negative"	1
pct neutral_label_count	daily percentage change of the count of the sentiment label "neutral"	1
pct positive_label_count	daily percentage change of the count of the sentiment label "positive"	1
Lag1 negative_label_count	lag 1 of daily count of the sentiment label "negative"	1
Lag1 neutral_label_count	lag 1 of daily count of the sentiment label "neutral"	1
Lag1 positive_label_count	lag 1 of daily count of the sentiment label "positive"	1
Lag2 negative_label_count	lag 2 of daily count of the sentiment label "negative"	1
Lag2 neutral_label_count	lag 2 of daily count of the sentiment label "neutral"	1
Lag2 positive_label_count	lag 2 of daily count of the sentiment label "positive"	1
Lag3 negative_label_count	lag 3 of daily count of the sentiment label "negative"	1
Lag3 neutral_label_count	lag 3 of daily count of the sentiment label "neutral"	1
Lag3 positive_label_count	lag 3 of daily count of the sentiment label "positive"	1
12 月	KeyWords	not included in dataset
1 月		
2 月		
3 月		
4 月		
CREA		
HOTHOLIDAYS メンバー達		
ICEEXPLOSION		
LIVE 配信の案内		
M ステ		
NHK ニュース速報		
PIW 広島		
Peing		
QUICPay タッチ		
QUO カード Pay		
RT		
TDFooclo		
ThePhoenix		
apreview		
gt		
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おしん		
おじ好き		
おつかれ		
おりん		
お世話		
お互い		
お仕事		
お休み		
お兄		
お写真		
お出		
お勧め		
お医者		
お友達		
お土産		
お声		
お大事		
お天気		
お好き		
お姉		
お子		
お家		
お寿司		
お尻		
お届け		
お布施		
お年		
お店		
お待ち		
お手		
お時間御座		
お楽しみ		
お湯		
お父様		
お疲れさま		
お疲れ様		
お目		
お礼		
お米		
お肉		
お花		
お菓子		

お見逃し		
お詫び		
お話		
お越し		
お身体		
お近く		
お邪魔		
お酒		
お題		
お顔		
お願い		
お風呂		
お食事券		
お餅		
かぐや様		
こちら		
こんにち		
ごはんバーガー		
ごま油濃口		
ご一緒		
ご丁寧		
ご主人様		
ご了承		
ご予約		
ご冥福		
ご利用		
ご参考		
ご報告		
ご存じ		
ご存知		
ご家族		
ご意見		
ご本人		
ご来店		
ご案内		
ご機嫌		
ご注文		
ご理解		
ご苦労		
ご褒美		
ご迷惑		
ご連絡		
すかいらーく各店		
たくの人		
つ目		

どうぶつの森		
どん兵衛		
ぶり		
まるかじりチューハイ		
ももクロ		
ん		
°Д °		
°ロ °		
アイキャッチャー		
アニメのキャラ		
エピックセブン		
オカン		
オタクくん		
オリンピック		
オーストラリアの火災		
カラーストーリー		
ガキ使		
キャンペーン		
クリスマス		
コセット		
コロコロ		
ゴーン被告		
ジャンプフェスタ		
スキンケアセット		
ストリーマ空気清浄機		
センター試験		
ダイの大冒険		
チャラ男		
チャレンジ		
チャンス		
ツイートのリツイート		
ツイート数		
デル製 PC		
ドローン		
ニトリ商品券		
ネットの反応		
パスワード法		
パラサイト		
ヒーローアカデミア		
フォロワー		
フォロー		
プレゼント		
プレモル		
ペイ		
ポケモン		

ポスト数		
マスク		
ミスタードーナツギフトチケット		
メメこんにち		
ライブ配信		
リツイート詳細		
レッズ秋山		
ロバマン		
ローソン		
ワクチン		
ヴァンラーレ八戸		
ヴィヴィくん		
一般動画		
一般男性		
一蘭		
世界初		
中国		
二宮和也		
京都市長選		
人		
人の事		
人の命		
人現世		
人目		
今		
今の日本		
今年		
今年中		
今度		
今日		
今晚		
今月		
今朝		
今週末		
仕事終わり		
令和元年		
企画趣旨		
伊藤詩織		
休みの日		
侍の名のもと		
保護猫		
個目		
公開当日		
円		

円税込		
写真		
富吉		
富吉明日香		
凍京 NECRO		
凍京ネクロ		
刀剣乱舞		
前日比		
動画		
医療機関のご案内		
匿名質問		
午後		
参加方法		
号機		
吉幾三作曲		
吉田照美		
君知ら		
周年		
唐田えりか		
回定期大会		
国内線往復航空券		
土		
土日		
多くの人		
大人のクリームパイ		
大声		
大好き		
大盛りご飯		
大野智		
女性専用車両		
子たち		
子供たち		
子供達		
安倍		
尾崎豊		
山鳥毛		
嵐		
年		
年 6 月		
年半		
年末		
年目		
年自分		
年越し		
年連続		

当アカウント		
当選報告		
復刻氷結		
応募		
悲報		
抽選		
拡散お		
拡散希望		
数量限定		
新型コロナウイルス		
新年		
日		
日午前		
日本		
日本のニュース		
日本のメディア		
日本のメーカー		
日本の司法		
日本政府		
日本時間		
日程度		
日高屋		
明日		
明日 1 月		
明日の天気		
明日の朝		
星野源		
昨日		
時間半		
最初		
最終日		
最近		
有餃		
朝トレ		
期間限定		
本アカウント		
本当		
本日		
本日 12 月		
本日 1 月		
本目		
本突破		
村元哉		
来年		
東京オートサロン		

東出昌大		
櫻井翔		
次		
欧米		
正月		
武漢		
歳		
歳の誕生日		
死亡		
毎日		
毎日挑戦		
注意喚起		
炭治郎		
猫ちゃん		
猫好き		
男の人		
番好き		
異世界		
疲れ様		
発売		
発目		
発表 apreview		
登場		
目		
稲垣吾郎		
笑		
笑明日		
笑笑		
筋トレ		
筋トレ🏋️		
米津玄師		
紅天		
紅天くん		
紅白		
総勢		
職場の人		
自分		
自分たち		
自分の人生		
自分自身		
自分達		
自宅待機		
自己肯定感		
艸、		
菅田将暉		

菅義偉		
親父熱愛		
記念セット		
誕生日		
語彙力		
質問箱		
遭遇情報		
金		
開催		
関ジャニ		
限定		
雨の日		
静岡タトゥー		
静岡刺青		
風景 landscape		
飲み会		
香取慎吾		
香港		
駒猫		
高橋大輔		
鬼滅		
鬼龍院		
麒麟		
여친 Air		
——		
☺		
negative KeyWords	whether the keyword is labeled "negative" 1=the keyword is labeled "negative" on that day 0=the keyword is labeled as "positive" or "neutral" on that day	363
positive KeyWords	whether the keyword is labeled "positive" 1=the keyword is labeled "positive" on that day 0=the keyword is labeled as "negative" or "neutral" on that day	363
count KeyWords	daily count of keywords	363
pct count KeyWords	daily percentage change of the count of keywords	363
Lag1 negative KeyWords	lag 1 of "negative KeyWords "	363
Lag1 positive KeyWords	lag 1 of "positive KeyWords "	363
Lag1 count KeyWords	lag 1 of "count KeyWords "	363
Lag2 negative KeyWords	lag 2 of "negative KeyWords "	363
Lag2 positive KeyWords	lag 2 of "positive KeyWords "	363
Lag2 count KeyWords	lag 2 of "count KeyWords "	363
Lag3 negative KeyWords	lag 3 of "negative KeyWords "	363
Lag3 positive KeyWords	lag 3 of "positive KeyWords "	363
Lag3 count KeyWords	lag 3 of "count KeyWords "	363
DiffLag1 count KeyWords	difference between lag 1 of "Lag1 count KeyWords " and "count KeyWords "	363

DiffLag2 count KeyWords	difference between lag 2 of "Lag2 count KeyWords " and "count KeyWords "	363
DiffLag3 count KeyWords	difference between lag 3 of "Lag3 count KeyWords " and "count KeyWords "	363
Roll3 count KeyWords	rolling windows(3) mean of "count KeyWords " calculate the mean of the previous 3 days as the 3rd day's value	363
DiffRoll3 count KeyWords	difference between rolling mean (3) of "Roll3 count KeyWords " and "count KeyWords "	363
Total:		6549

Total:

6549

Appendix D

List of variables based on events.

Variable Name	Source	Content of Events
E2020-01-06	Ministry of Health, Labour and Welfare	Ministry of Health, Labour and Welfare post a warning about the pneumonia of unknown cause in Wuhan city, Hubei Province of China.
E2020-01-08	WHO	WHO says mysterious illness in China likely being caused by new virus.
E2020-01-11	NEWS	China reports first death from mysterious outbreak in Wuhan
E2020-01-14	WHO	WHO's technical lead for the response noted in a press briefing there may have been limited human-to-human transmission of the coronavirus (in the 41 confirmed cases), mainly through family members, and that there was a risk of a possible wider outbreak. The lead also said that human-to-human transmission would not be surprising given our experience with SARS, MERS and other respiratory pathogens.
E2020-01-16	NEWS	Japan confirms first case of coronavirus that has infected dozens in China
E2020-01-19	Chinese government	In its first statement since the outbreak, the body promised to step up monitoring during the Lunar new year.
E2020-01-20	Chinese government	Wuhan establishes headquarters for pneumonia control
E2020-01-21	WHO	WHO mission to China issued a statement saying that there was evidence of human-to-human transmission in Wuhan but more investigation was needed to understand the full extent of transmission.
E2020-01-21	NEWS	Taiwan Confirms First Case of Infection From New Coronavirus
E2020-01-23	Chinese government	panic and anger in Wuhan as China orders city into lockdown
E2020-01-23	WHO	The WHO Director- General convened an Emergency Committee (EC) under the International Health Regulations (IHR 2005) to assess whether the outbreak constituted a public health emergency of international concern. The independent members from around the world could not reach a consensus based on the evidence available at the time. They asked to be reconvened within 10 days after receiving more information.
E2020-01-29	NEWS	A charter jet evacuating the first group of Japanese nationals from Wuhan, the Chinese city at the center of a deadly virus outbreak, arrived in Tokyo.
E2020-01-30	WHO	The WHO Director-General declared the novel coronavirus outbreak (2019-nCoV) a PHEIC.
E2020-01-30	PM Abe	PM Abe held a meeting of the Novel Coronavirus Response Headquarters at the Diet.
E2020-01-31	PM Abe	PM Abe said the government will move up the implementation of an ordinance naming the virus a "designated infectious disease" to Saturday.
E2020-02-03	Diamond Princess	10 people have tested positive for Coronavirus.

Appendix E

List of additional variables.

Variable Name	Description	Number of Variables
date	from 2019-12-04 to 2020-02-10	1
weekend	binary variable to represent weekends 1 = Saturday or Sunday 0 = weekdays	1
day_of_week_Friday	binary variable to represent Friday 1 = Friday 0 = other days of a week	1
day_of_week_Monday	binary variable to represent Monday 1 = Monday 0 = other days of a week	1
day_of_week_Saturday	binary variable to represent Saturday 1 = Saturday 0 = other days of a week	1
day_of_week_Sunday	binary variable to represent Sunday 1 = Sunday 0 = other days of a week	1
day_of_week_Thursday	binary variable to represent Thursday 1 = Thursday 0 = other days of a week	1
day_of_week_Tuesday	binary variable to represent Tuesday 1 = Tuesday 0 = other days of a week	1
day_of_week_Wednesday	binary variable to represent Wednesday 1 = Wednesday 0 = other days of a week	1
payday_5	binary variables to represent every 5th/10th/15th/20th/25th/30th of the month as common paydays in Japan; if during weekends, then label the next Mondy instead 1 = paydays 0 = otherwise	6
payday_10		
payday_15		
payday_20		
payday_25		
payday_30		
payday_5_lag1	binary variables to represent the day after the paydays 1 = the day after the paydays 0 = otherwise	6
payday_10_lag1		
payday_15_lag1		
payday_20_lag1		
payday_25_lag1		
payday_30_lag1		

PM2.5	AQI of PM2.5 in Tokyo	1
if_rain	binary variable to represent rainy days 1 = rain 0 = otherwise	1
holiday	binary variable to represent national holidays 1 = national holiday 0 = otherwise	1
Total:		24

Appendix F

List of categories used by IBM Watson NLU. Due to the length of the list, please refer to the link for further details.