

International Gold Price Predictive Analytics

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Objective

To predict the international gold price by analyzing consumer demand obtained from social media as well as financial newsfeed.

Methodology

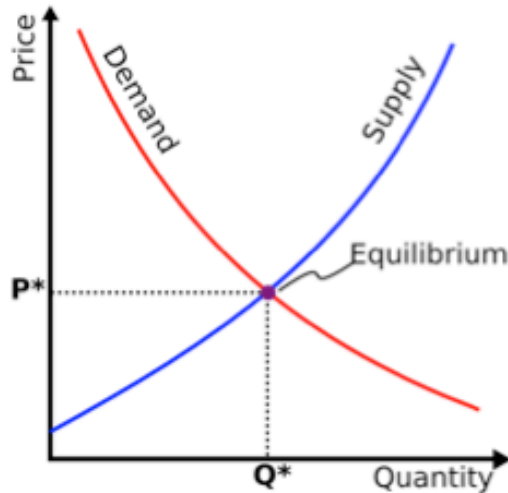
1. Data Acquisition
2. Data Cleansing
3. Text Mining
4. Regression Analysis
5. Predictive Analytics

Underlying Principle



The gold price is constant
irrespective of country or currency!

1g @ INR 2,547 / USD 39 / EURO 35



The international gold price
is purely determined by the
international demand and supply.



The slight variations are
because of the
**government taxes and
customs duty**



Social Media

#BRIKK
#GoldGenie
#Miansai
#GoldSouk
#GoldPrice
#GoldBullion
#24Karat
#22Karat
#18Karat
#GoldCoin
#GoldJewellery
#GoldDemand
#GoldBar
#YellowMetal
#SpotGold
#GoldFutures



Newsfeed

THE WALL STREET JOURNAL.

THE ECONOMIC TIMES

GULF  TIMES

FT FINANCIAL
TIMES

Data Acquisition

Data Miner Chrome Plugin

Google Advanced Search Export

Twitter Variables

Handle/Link

Full Name

Time

Tweet/Text

@Reply 1-5

News Variables

Position

URL

Title

Description

Page Authority

Total Links to Page

Total Linking Root

Domains to Page

Domain Authority

Total Links to Root

The screenshot shows the Data Miner Chrome plugin interface. On the left is a configuration panel with sections for 'Use an Existing Presets', 'My Presets', 'Community Presets', 'Selector for Table or List', and 'Selectors for Columns'. The 'Selectors for Columns' section is expanded, showing a list of XPath selectors with checkboxes for inclusion or exclusion. The main panel on the right displays a table of data extracted from a Twitter profile, with columns for Handle/Link, Full Name, Time, Tweet text, and replies.

	Handle/Link	Full Name	Time	Tweet text	@reply 1	@reply 2	@reply 3	@reply 4	@reply 5
1	/Kennyide	Shin-Kennyide	Jan 4	When you go 202 and everyone else on your team goes negative by at least 10..... pic.twitter.com/4Ri0av1E1r					
2	/psychologyqt	Psychology Quotes	Jan 4	Whatever you do, good or bad, people will always have something negative to say about you and that's life.					
3	/RobLikesToYell	Robert	Jan 4	If you put in the hard work, you can literally have anything you want. Get rid of the negative mindset that you can't or you're too busy.					
4	/lilmahg	Be Successful	Jan 4	If you realized how powerful your thoughts are, you would never think a negative thought. -Peace Pilgrim					
5	/gnarlywood	George Underwood	Jan 4	New film. Amazing that this is a negative on a light box photographed with my phone. #selfportrait. http://instagram.com/phaTKUdL4l/					
6	/JesseBlush	Jessie Blush	Jan 4	It feels great to have finally removed a few negative people from my life					
7	/stephenproctor	stephen proctor	Jan 4	@opackiam be more critical. Critical doesn't equal "negative". You can critique in love. If we remain nice & sentimental, we'll never grow	/opackiam				
8	/Naturalmedicin	NaturalMedicines	Jan 4	Measles Cases Came Back Negative, Pa. Says - Science World Report: Science World ReportMeasles Cases Came Back... http://bit.ly/1F1LqPs					
9	/RStephen5	Richard Stephenson	Jan 4	Stop Criticizing Me! How this #IndieAuthor copes with negative criticism. http://bit.ly/1IQashPP #asmmsg					
10	/anmc2010	Ian McClellan	Jan 4	My intention is to fill Facebook with Star Wars characters to break the saturation of negative images and videos... http://fb.me/3bC6vOZAm					
11	/RicardoEquips	Ap. Ricardo Butler	Jan 4	According to research, non-believers say Christians are negative and seem unhappy. What does God say?... http://fb.me/k7FQOv1p1					
12	/Motivated_Self	Motivational Quotes	Jan 4	Stay ambitious. Avoid negative people. Fight for your hopes and dreams.					
13	/TheSecretLawofA	The Secret LOA	Jan 4	"If you can practice the art of vagueness on subjects that make you feel negative emotion and the art of... http://dtd.bz/ds1/vk					
14	/treavery	Tre'	Jan 4	I always wondered why the negative thoughts linger in the mind longer than the positive ones.					

Data Cleansing

Title & Date Extraction | General Cleansing

```
# remove retweet entities
data = gsub("(RT|via)((?:\\b\\W*@\\w+)+)", "", data)
# remove at people
data = gsub("@\\w+", "", data)
# remove punctuation
data = gsub("[[:punct:]]", "", data)
# remove numbers
data = gsub("[[:digit:]]", "", data)
# remove html links
data = gsub("http\\w+", "", data)
# remove unnecessary spaces
data = gsub("[ \\t]{2,}", "", data)
data = gsub("^\\s+|\\s+$", "", data)
data <- gsub(" +", " ", gsub("^ +", "", gsub("[^a-zA-Z0-9 ]", "", data)))
```



Text Mining

Sentiment Analysis


```
library(sentiment)
```

```
class_emo1 = classify_emotion(Data_Jan, algorithm="bayes", prior=1.0)
```

```
class_emo2 = classify_emotion(Data_Feb, algorithm="bayes", prior=1.0)
```

```
class_emo3 = classify_emotion(Data_Mar, algorithm="bayes", prior=1.0)
```

```
class_emo4 = classify_emotion(Data_Apr, algorithm="bayes", prior=1.0)
```



Sentiment	Jan	Feb	Mar	Apr
anger	60	74	85	107
disgust	3	10	7	8
fear	5	7	5	5
joy	676	1030	674	744
sadness	64	128	37	73
surprise	12	16	17	8
NA's	3044	4030	3619	4481

Month	Negative	Positive	Neutral
Jan	-132	688	3044
Feb	-219	1046	4030
Mar	-134	691	3619
Apr	-5	752	4481

Rejected Models

Descriptive Statistics exploited to the hilt!

*Price for 8 grams

Month	Negative	Positive	Neutral	Mode Price	Predict Price	error
Jan	-132	688	3044	21120	22172.90	1052.90
Feb	-219	1046	4030	20480	21891.80	1411.80
Mar	-134	691	3619	19720	20948.92	1228.92
Apr	-5	752	4481	20120	116357.79	96237.79

*Price for 8 grams

Month	Negative	Positive	Neutral	Mean Price	Predict Price	error
Jan	-132	688	3044	20627.12	21136.80	509.680
Feb	-219	1046	4030	20438.56	20505.90	67.340
Mar	-134	691	3619	19763.84	19736.90	-26.940
Apr	-193	752	4481	20052.72	-28844.90	-48897.620

Regression Analysis

4 days' sentiment => 5th day price!




Month	Negative	Positive	Neutral	1-Gram Price	Predict Price	error
Jan	-132	688	3044	2520	2519.99754	-0.00246
Feb	-219	1046	4030	2620	2619.99633	-0.00367
Mar	-134	691	3619	2490	2489.99741	-0.00259
Apr	-193	752	4481	2500	2499.99694	-0.00306

$$\text{Price} = \text{Negative} * (-0.72087) + \text{Positive} * (0.25846) - \text{Neutral} * (0.05603) + 2417.57754$$

Predictive Analytics

Predicting the International Gold Price on the 5th of May, 2015



Sentiment	May
anger	74
disgust	1
fear	5
joy	534
sadness	32
surprise	16
NA's	2965

Month	Negative	Positive	Neutral
May	-112	550	2965

Negative	Positive	Neutral	1-Gram Price	Predict Price	error
-112	550	2965	2483.500	2474.339	-9.16097



+ 4 days!

International
Gold Price



[illegible]