In [1]:
```
import re
import pandas as pd
import numpy as np
from sklearn.naive_bayes import GaussianNB
```

In [2]:
```
P1="I’ve seen a lot of bad reviews for this phone based on issues with
the seller. Granted, some of those reviews say it took a few weeks for
the problems to appear so I’ll edit this if that happens, but wow was I
happy with what I got. Not only did it come with a charger (there’s som
e debate on that in other reviews), but it even had a clear bumper cas
e. That was neither expected nor necessary but I appreciated it (I boug
ht a Unicorn Beetle case which I have used and loved before on other ph
ones). There wasn’t a scratch on this phone and it started working righ
t away for me. The battery seems to be holding up fine. All in all I’d
say this seems like a steal. If it self destructs on me in the next few
weeks I’ll update this. UPDATE: It's been a few months and a trip overs
eas since I wrote that initial review, and it remains a solid decision
I'm very happy with."
```

In [3]:
```
P2="This phone looks and performs great like it's brand new. Not one sc
ratch. The phone came with a screen protector and a charger. I was surp
rised as other reviews said they did not get one. For $269, I feel like
this was a steal, compared to other listings. Hopefully nothing goes wr
ong with the phone later. But with the Amazon 90 day guarantee I'm a li
ttle more at ease about possible return. Never bought a refurbished pho
ne before. Not sure what to expect. As far as my order, I am happy with
it."
```

In [4]:
```
P3="Don't listen to bad reviews! My phone arrived in great condition. T
here are no scratches on the glass, and there is no visible wear and te
ar on the case. It works perfectly. I inserted my carrier-provided SIM
card in the SIM tray and it was immediately available on AT&T's networ
k. A SIM tray key was included in the box along with protective plastic
covers for the screen. A charging cable and standard outlet plug were a
lso included in the box. This version of the iPhone does not have a hea
dphone jack. I did not receive a headphone insert in the box, but (#1)
I don't need one as all of my headphones are Bluetooth and (#2) I don't
know if Apple included this in the original packaging so this is just a
courtesy note for potential buyers of the iPhone 7, not a complaint. Th
e seller contacted me after I received my phone to make sure I was happ
y with the purchase and I am."
```

In [5]:
```
P4="Love this phone! I am so glad I bought a refurbished one. I took it
to the Apple store just in case to do a diagnostics on it and said that
it was refurbished and bought through Amazon, and Apple checked it and
said everything is great. Very happy with my purchase."
```

In [6]:
```
P5="First, seller did a great job and I think I got a good price for an
iPhone 7, I just think ALL CELL PHONES are way way way too expensive. W
hen a Cell phone costs more than a good laptop computer that is too exp
ensive. Second all Smart phones have bad battery life. Apple's iPhones
are no exception. There is a mode on the iPhone 7 to allow for an exten
ded battery life setting. But I see no difference between the extended
setting and the normal setting. I do not use my phone except for emerge
ncies so I would expect the phone to last 5-6 days between charging, bu
t I am averaging 3-4 days between charging. I am having an issue that t
he WiFi doesn't see both of my wireless networks (dual band router). Se
ller tried to help but Apple's support said if it sees a network that's
all they care about. Phone appears to be working fine and so far I am h
appy with it."
```

In [7]:
```
P6="Received prompt delivery of the phone. I inserted my 'sim card' and
the phone was functional with no issues and I could make and receive ca
lls right away, so far so good. I received the phone which is cosmetica
lly in very good condition and I am quite happy with my purchase with e
xception of two minor issues which I believe someone could provide me g
uidance to resolve or trouble shoot."
```

In [8]:
```
N1="Overall, the phone isn't too bad for the price. It came already scr
atched up, overheats more than a normal iPhone (I've had tons of iPhone
s). The delivery process of just getting the phone was pretty stressfu
l, I'm a month and half in using the iPhone and I called customer servi
ce to see if they could replace my iphone because it got to the point w
here my hands feel the burning from the phone... the lady was so unhelp
ful, bland and kind of rude. The return proccess would be such a hassle
and leave me phoneless so I decided to keep the phone instead. All the
functions work fine, it's just that the iphone started heating up the m
oment I got it. I don't usually write reviews no matter how good or bad
a product is, but I've never received such bad service from a company,
especially amazon sellers. I'm basically stuck with the phone, or be ph
oneless. I would recommend the phone, but just know there will definite
ly some things you need to deal with. HAVE A NICE DAY TO WHOEVER IS REA
DING :)"
```

In [9]:
```
N2="The iPhone 7 I purchased was \"certified refurbished\" and labeled
as \"new\" quality but doesn't work. The phone looks great, but when I
first turned it on it was in a restart loop. This was a bad sign to beg
in with, but I gave it the benefit of the doubt and connected it to my
computer. When I finally got it to restore to factory settings, the scr
een started glitching to the point where there was nothing to stop it,
and if it did get to the startup screen, it was non-responsive."
```

In [10]:
```
N3="Initially I was happy with the phone. It looked great physically an
d had no signs of wear and tear. However, the battery health was lower
than I wanted; the phone said the battery health was 88%. However, I kn
ew from the ad, that it could ship with as low as 85%, so I can't compl
ain too much about that. The biggest issue with the phone that was an a
bsolute deal breaker was that it frequently crashed and closed apps on
me. Other times it would freeze up. Imagine having an emergency and hav
ing to make a phone call, only to find out that your phone decided to f
reeze up?! I have a family, so that's completely unacceptable. The phon
e also seemed to have connectivity issues and would not connect well wi
th my wifi. It was slower than my other devices on my wifi and would so
metimes freeze up. With the problems that I was having, I'm thinking it
was a bad main board or \"motherboard\". The seller was MobileSpree. I
contacted them and asked for an exchange. They refused to do an exchang
e and said my only option was to return it. I returned it with the ship
ping label provided by Amazon. However, even after 5 days of having the
phone back, they would not refund my money. I had to get Amazon involve
d to get a refund. Overall, don't buy. It was a waste of time and money
and a hassle to get refunded."
```

In [11]:
```
N4="Be cautious - if you have ANY issues at all, return phone immediate
ly. We got one for my daughter, paid $244 and it didn’t last 4 months.
Seller will not replace/return as it is past 90 days. She had intermitt
ent issues with service connections shortly after receiving the phone.
When it finally stopped connecting at all and we had it checked at the
AT&T store, they told us it was an internal issue with the SIM card bra
ckets that connects to the mother board. Basically causing a fatal erro
r and cannot get any service connection. I contacted the seller and rec
eived the generic “past the 90 day warranty” so there is nothing they w
ill do about it. We may try to have it repaired, but the repair shop is
looking at $100 to inspect and possibly repair, if it can be repaired.
I guess that’s our expensive mistake, but at least we can warn others."
```

In [12]:
```
p1=re.findall("Great|great|Happy|happy|Bad|bad|Return|return",P1)
p2=re.findall("Great|great|Happy|happy|Bad|bad|Return|return",P2)
p3=re.findall("Great|great|Happy|happy|Bad|bad|Return|return",P3)
p4=re.findall("Great|great|Happy|happy|Bad|bad|Return|return",P4)
p5=re.findall("Great|great|Happy|happy|Bad|bad|Return|return",P5)
p6=re.findall("Great|great|Happy|happy|Bad|bad|Return|return",P6)
n1=re.findall("Great|great|Happy|happy|Bad|bad|Return|return",N1)
n2=re.findall("Great|great|Happy|happy|Bad|bad|Return|return",N2)
n3=re.findall("Great|great|Happy|happy|Bad|bad|Return|return",N3)
n4=re.findall("Great|great|Happy|happy|Bad|bad|Return|return",N4)

# print(p1)
# print(p2)
# print(p3)
# print(p4)
# print(p5)
# print(p6)
# print(n1)
# print(n2)
# print(n3)
# print(n4)
```

In [13]:
```
data=pd.DataFrame(index=np.arange(5),columns=np.arange(0))
```

In [14]:
```
data['p1']=pd.Series(p1)
data['p2']=pd.Series(p2)
data['p3']=pd.Series(p3)
data['p4']=pd.Series(p4)
data['p5']=pd.Series(p5)
data['p6']=pd.Series(p6)
data['n1']=pd.Series(n1)
data['n2']=pd.Series(n2)
data['n3']=pd.Series(n3)
data['n4']=pd.Series(n4)

data
```

Out[14]:

	p1	p2	p3	p4	p5	p6	n1	n2	n3	n4
0	bad	great	bad	great	great	happy	bad	great	happy	return
1	happy	return	great	happy	bad	NaN	return	bad	great	return
2	happy	happy	happy	NaN	happy	NaN	bad	NaN	bad	NaN
3	NaN	NaN	NaN	NaN	NaN	NaN	bad	NaN	return	NaN
4	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	return	NaN

In [15]:
```
data = data.transpose()
data
```

Out[15]:

	0	1	2	3	4
p1	bad	happy	happy	NaN	NaN
p2	great	return	happy	NaN	NaN
p3	bad	great	happy	NaN	NaN
p4	great	happy	NaN	NaN	NaN
p5	great	bad	happy	NaN	NaN
p6	happy	NaN	NaN	NaN	NaN
n1	bad	return	bad	bad	NaN
n2	great	bad	NaN	NaN	NaN
n3	happy	great	bad	return	return
n4	return	return	NaN	NaN	NaN

In [16]:
```
data['result']=['positive','positive','positive','positive','positive
','positive','negative','negative','negative','negative']
```

In [17]:
```
data
```

Out[17]:

	0	1	2	3	4	result
p1	bad	happy	happy	NaN	NaN	positive
p2	great	return	happy	NaN	NaN	positive
p3	bad	great	happy	NaN	NaN	positive
p4	great	happy	NaN	NaN	NaN	positive
p5	great	bad	happy	NaN	NaN	positive
p6	happy	NaN	NaN	NaN	NaN	positive
n1	bad	return	bad	bad	NaN	negative
n2	great	bad	NaN	NaN	NaN	negative
n3	happy	great	bad	return	return	negative
n4	return	return	NaN	NaN	NaN	negative

In [18]:
```
data=data.fillna(0)
```

In [19]:
```
data=data.replace(to_replace ='great', value =1)
data=data.replace(to_replace ='happy', value =1)
data=data.replace(to_replace ='bad', value =-1)
data=data.replace(to_replace ='return', value =-1)

# data=data.replace(to_replace ='positive', value =1)
# data=data.replace(to_replace ='negative', value =-1)
data
```

Out[19]:

	0	1	2	3	4	result
p1	-1	1	1	0	0	positive
p2	1	-1	1	0	0	positive
p3	-1	1	1	0	0	positive
p4	1	1	0	0	0	positive
p5	1	-1	1	0	0	positive
p6	1	0	0	0	0	positive
n1	-1	-1	-1	-1	0	negative
n2	1	-1	0	0	0	negative
n3	1	1	-1	-1	-1	negative
n4	-1	-1	0	0	0	negative

In [20]:
```
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split
from sklearn.naive_bayes import GaussianNB
```

In [21]:
```
#result = ['Positive','Positive','Positive','Positive','Positive','Posi
tive','Negative','Negative','Negative','Negative']
result=data['result']
data=data.drop(columns=['result'])
data['sum']=data.sum(axis=1)
#if sum is 0 replace it with -2
data['sum']=data['sum'].replace(to_replace =0, value =-2)

data
```

Out[21]:

	0	1	2	3	4	sum
p1	-1	1	1	0	0	1
p2	1	-1	1	0	0	1
p3	-1	1	1	0	0	1
p4	1	1	0	0	0	2
p5	1	-1	1	0	0	1
p6	1	0	0	0	0	1
n1	-1	-1	-1	-1	0	-4
n2	1	-1	0	0	0	-2
n3	1	1	-1	-1	-1	-1
n4	-1	-1	0	0	0	-2

In [22]:
```
X=data
y=result
```

In [23]:
```
from sklearn.naive_bayes import GaussianNB
gnb = GaussianNB()
gnb.partial_fit(X, y, np.unique(y))
```

Out[23]:
```
GaussianNB(priors=None, var_smoothing=1e-09)
```

In [24]:
```
print(gnb.predict([[1,-1,0,0,0,-2]]))
```

```
['negative']
```

In [25]:
```
U1="The phone arrived in pretty decent condition. The front screen was
scratch-free and the display is great, but there is a long scratch on t
he back of the phone. This doesn't bother me much because I always have
a case on my phone. However, the issue with this phone is that the cell
ular signal won't work; the device detects the sim but the signal is ba
d. Apparently this is an issue with some iPhone 7 models, but the any f
ree of charge repair is not valid because the phone is coming from a th
ird party seller. After speaking with Apple, Verizon (my mobile carrie
r), AND Amazon, I've reached the conclusion that the issue is with the
phone. I've tried everything to troubleshoot, but I will unfortunately
have to return the item and get another one."
```

In [26]:
```
U2="iPhone 7 Black came in excellent condition. Like new. No scratches
or scuffs. Works great. Was happy for couple months until phone started
to develop issues with hearing callers and vs versa. Callers can't hear
me and I can't hear callers, the sound is bad. Checked settings . Disab
led WiFi calling. Hard reset phone. Updated iOS. Happens randomly. Susp
ect possible known defects on iPhone 7 with audio IC chips. I want to r
eturn the phone but I'm waiting to se for a month"
```

In [27]:
```
u1=re.findall("Great|great|Happy|happy|Bad|bad|Return|return",U1)
u2=re.findall("Great|great|Happy|happy|Bad|bad|Return|return",U2)
print(u1)
print(u2)
```

```
['great', 'bad', 'return']
['great', 'happy', 'bad', 'return']
```

In [28]:
```
print(gnb.predict([[1,-1,-1,0,0,-1]]))
print(gnb.predict([[1,1,-1,-1,0,-2]]))
```

```
['negative']
['negative']
```