

Projet fouille de données

thème Classification des tweets

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Les objectifs de se projet consiste à:

- Maitriser l'API de twitter pour l'extraction des tweets
- Maitriser la partie NLP (naturallanguageprocessing) avec NLTK en Python
- Appliquer les principes de nettoyage des données
- Classer les tweets: regrouper ensemble les tweets qui sont similaires.C'est une étape qui peut être considérée comme une étape

Introduction

De nombreuses conversations intéressantes se déroulent sur Twitter, et il peut être difficile de trouver les plus pertinentes . Les sujets peuvent vous y aider mais il est presque impossible de suivre toutes l'actualité, les nouvelles et les tweets donc il devient très important d'avoir un résumé à propos tout ce qui deroulent: d'ou on est demandé de réaliser une application qu'on peut utilisé pour classer les tweets sous form de groupes de sorte à ce qu'on présente à l'utilisateur un seul Tweet de chaque group.</P>

ce projet est dévisé en trois partie:

- Prétraitement des tweets
- Traitement destweets: NLP (Natural LanguageProcessing)
- Classification des tweets

Partie I:Prétraitement des tweets

Dans cette partie, on amené à nettoyé les données collecté afin d'éliminer le texte inutile des tweets tels que les #, les noms des utilisateurs,les url,les emojis ...

avant de commencer il faut tout d'abord de créer un compte twitter developper afin d'avoir l'accès à télécharger les tweets d'ou on obient la clé et l'acées à l'api twitter our q'on puisse traiter les données

Collecte des données:</p>

</p>on commence par installer les bibliothèques liée a twitter: tweety,tweepy et twitter par les commande ci-dessous:

In []:

```
# Import the required libraries
```

```
# import the required libraries.
```

```
import tweepy
import pandas as pd
import matplotlib.pyplot as plt
```

```
consumer_key = "Tippg04Ns8bfIZtE3uMprKEym"
consumer_secret = "qHjBkD4CBX67rHPenKu96c7W5Tsv59t9BGBVsm0pXM0oLatOS8"
access_key= "1328070400136400905-ZOCTds4L0DD3LqMJ2r9rZHSyAi75Xu"
access_secret = "qX3pBBD42A1dAZDPXx2DGch0T0hcr4e5Oxw40YwR9wTnc"
```

```
auth = tweepy.OAuthHandler(consumer_key, consumer_secret)
auth.set_access_token(access_key, access_secret)
api = tweepy.API(auth,wait_on_rate_limit=True)
```

```
result=[]
```

```
for tweet in tweepy.Cursor(api.search,q="#",
                           lang="en",
                           since="2020-01-01").items(15000):
    result.append(tweet)
    #print (tweet.created_at, tweet.text)
    leng= len(result)
print(leng)
```

In []:

```
i=0

for tweet in tweepy.Cursor(api.search,q="#",
                           lang="en",
                           since="2020-01-01").items(15000):
    twitter_data.loc[i,"text"] = tweet.text
    i+=1
```

In []:

```
import csv
twitter_data.to_csv('twitterData.csv',index = False)
```

In [24]:

```
twitter_data = pd.read_csv('twitterData.csv')
```

In [25]:

```
print(twitter_data.shape)
```

```
(15000, 1)
```

on enregistre le data frame obtenu à partir de l'api twitter sous forme d'un fichier csv

pour s'assurer qu'on n'a pas des tweets vides on tape la commande suivante

In [26]:

```
twitter_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 15000 entries, 0 to 14999
Data columns (total 1 columns):
#   Column  Non-Null Count  Dtype
---  -
0    text    15000 non-null     object
dtypes: object(1)
memory usage: 117.3+ KB
```

on a obtenu des tweets brutes qui contiennent beaucoup des données unitiles

In [27]:

```
twitter_data.head(10)
```

Out[27]:

	text
0	RT @chynxoxo: Build a team \nSo strong\nYou do...
1	@CaptainOskarSTO a long, long time
2	Congrats: 1st Team Offense:\nBrandon Goodman -...
3	mad I can't call tom a simp in the twitch chat...
4	WHAAAAAT https://t.co/K4Ufjxelsz
5	RT @Zariinaa_: no I still got the nasty one
6	@donwinslow @realDonaldTrump He's a TRAITOR! [] []...
7	@tommycollison @LambdaSchool Exciting! Congrat...
8	oh come on even I know that's not the real pik...
9	My grandfather often helped feed the prisoners...

on est amené maintenant à nettoyer les données

Prétraitement des données:

dans cette partie on va utiliser RegEx

Un RegEx, ou expression régulière, est une séquence de caractères qui forme un modèle de recherche. Le RegEx peut être utilisé pour vérifier si une chaîne contient le modèle de recherche spécifié.

Python possède un paquet intégré appelé re, qui peut être utilisé pour travailler avec des expressions régulières.

Dans re.sub(), on spécifie un modèle d'expression régulière dans le premier argument, une nouvelle chaîne dans le deuxième argument, et une chaîne à traiter dans le troisième argument

Nous pouvons combiner un modèle d'expression régulière en objets de type "pattern", qui peuvent être utilisés pour la comparaison de modèles. Il est également possible de

peuvent être utilisées pour la comparaison de modèles. Il est également possible de rechercher à nouveau un modèle sans le réécrire grâce la fonction `re.compile`

maintenant on commence à nettoyer les données en éliminant les données utiles

In [52]:

```
import re
for index, row in twitter_data.iterrows():
    text= row['text']
    httpdata= re.sub(r"http\S+", "", text)

    hashdata = re.sub(r"#\S+", "", httpdata)
    atdata = re.sub(r"@\S+", "", hashdata)
    brdata = re.sub(r"\n+", "", atdata)
    rtdata = re.sub(r"RT+", "", brdata)
    numddata = re.sub('[0-9]+', "", rtdata)
    laughdata = re.sub("hhh+", '', rtdata)
    emoji = re.compile("[
        u"\U0001F600-\U0001F64F"    # emoticons
        u"\U0001F300-\U0001F5FF"    # symbols & pictographs
        u"\U0001F680-\U0001F6FF"    # transport & map symbols
        u"\U0001F1E0-\U0001F1FF"    # flags (iOS)
        u"\U00002500-\U00002BEF"    # chinese characters
        r
        u"\U00002702-\U000027B0"
        u"\U00002702-\U000027B0"
        u"\U000024C2-\U0001F251"
        u"\U0001f926-\U0001f937"
        u"\U00010000-\U0010ffff"
        u"\u2640-\u2642"
        u"\u2600-\u2B55"
        u"\u200d"
        u"\u23cf"
        u"\u23e9"
        u"\u231a"
        u"\ufe0f"    # dingbats
        u"\u3030"
    ]+", flags=re.UNICODE)
    newdata = re.sub(emoji, "", laughdata)
    twitter_data.loc[index, 'text'] =newdata
```

apres avoir nettoyer les données on peut vérifier s'ils sont prêtes pour être traitées

In [53]:

```
twitter_data.head(15)
```

Out[53]:

	text
0	Build a team So strongYou don't know who the...
1	a long, long time

2	Congrats: 1st Team Offense:Brandon Goodman RB
3	mad I can't call tom a simp in the twitch chat...
4	WHAAAAAT
5	no I still got the nasty one
6	He's a TRAITOR!
7	Exciting! Congratulations, Tommy!
8	oh come on even I know that's not the real pik...
9	My grandfather often helped feed the prisoners...
10	Omfg
11	5A01C654 :Battle IDI need backup!Lvl 150 Tiana...
12	it costs \$0.00 to share and support an artist
13	Didn't take long at all. We are back to the ...
14	not really what i was going for there at all,...

In [62]:

```
twitter_data.to_csv('newTwitterData.csv', index = False)
```

vu que les données ne contiennent plus les caractères spéciaux on peut maintenant au traitement

Partie II: Traitement des tweets: NLP (Natural Language Processing)

Natural Language Toolkit (NLTK) est une boîte-à-outil permettant la création de programmes pour l'analyse de texte.

pour cette partie on va utiliser la bibliothèque nltk

La première manipulation souvent effectuée dans le traitement du texte est la suppression de ce qu'on appelle en anglais les stopwords. Ce sont les mots très courants dans la langue étudiée ("and", "a", "the"...) qui n'apportent pas de valeur informative pour la compréhension du "sens" d'un document et corpus. Ils sont très fréquents et ralentissent notre travail : nous souhaitons donc les supprimer.

Il existe dans la librairie NLTK une liste par défaut des stopwords dans plusieurs langues, nous allons faire ceci d'une autre manière à supprimer les mots les plus fréquents du corpus et considérer qu'ils font partie du vocabulaire commun et n'apportent aucune information.

In [54]:

```
!pip install nltk
import nltk
nltk.download('punkt')
nltk.download('stopwords')
nltk.download('wordnet')
```

Requirement already satisfied: nltk in c:\users\aoem\anaconda3\lib\site-packages (3.5)

Requirement already satisfied: tqdm in c:\users\aoem\anaconda3\lib\site-packages (from nltk) (4.47.0)

```
packages (from nltk) (4.4.0)
```

```
Requirement already satisfied: click in c:\users\aoem\anaconda3\lib\site-packages (from nltk) (7.1.2)
```

```
Requirement already satisfied: joblib in c:\users\aoem\anaconda3\lib\site-packages (from nltk) (0.16.0)
```

```
Requirement already satisfied: regex in c:\users\aoem\anaconda3\lib\site-packages (from nltk) (2020.6.8)
```

```
[nltk_data] Downloading package punkt to  
[nltk_data] C:\Users\aoem\AppData\Roaming\nltk_data...  
[nltk_data] Package punkt is already up-to-date!  
[nltk_data] Downloading package stopwords to  
[nltk_data] C:\Users\aoem\AppData\Roaming\nltk_data...  
[nltk_data] Package stopwords is already up-to-date!  
[nltk_data] Downloading package wordnet to  
[nltk_data] C:\Users\aoem\AppData\Roaming\nltk_data...  
[nltk_data] Package wordnet is already up-to-date!
```

Out[54]:

True

Plus qu'une dernière étape et on en aura terminé avec le prétraitement ! Le processus de « lemmatisation » consiste à représenter les mots (ou « lemmes ») sous leur forme canonique. Par exemple pour un verbe, ce sera son infinitif. Pour un nom, son masculin singulier. L'idée étant encore une fois de ne conserver que le sens des mots utilisés dans le corpus. Si l'on reprend notre exemple précédent, "Bonjour, je suis un texte d'exemple pour le cours d'Openclassrooms. Soyez attentifs à ce cours !" L'idéal serait d'extraire les lemmes suivants : « bonjour, être, texte, exemple, cours, openclassrooms, être, attentif, cours ». Dans le processus de lemmatisation, on transforme donc « suis » en « être » et « attentifs » en « attentif ».

In [55]:

```
from nltk.stem.porter import PorterStemmer  
from nltk.corpus import stopwords  
Porter_steamer = PorterStemmer()  
vectorizer = CountVectorizer()  
stem_data=[]  
for i in range(0, twitter_data.shape[0]):  
    stemmed_array=twitter_data['text'][i].split()  
    stemmed=[Porter_steamer.stem(word) for word in stemmed_array if not  
word in set(stopwords.words('english'))]  
    stemmed=' '.join(stemmed)  
    stem_data.append(stemmed)  
print(stem_data[0:20])
```

```
['build team So strongyou know boss', 'long, long time', 'congrats: 1st  
team offense:brandon goodman - RB', "mad I can't call tom simp twitch ch  
at anymor", 'whaaaat', 'I still got nasti one', "he' traitor!", 'excitin  
g! congratulations, tommy!', 'oh come even I know that' real pikachu', '  
My grandfath often help feed prison short cooks, notic SS would alway du  
mp...', 'omfg', '5a01c654 :battl idi need backup!lvl 150 tiamat malic', 'c  
ost $0.00 share support artist', 'didn't take long all. We back nonsens  
shit. but anyth illeg would blurb t...', 'realli go all, think biowar get  
benefit doubt t...', 'and hade', 'over 42,000 nevada voter vote once.', 'c  
heeki submiss', "you get 'used' copi 'miss, what doe incomprehens mean?"  
$7.49 samp: free delivery " the moment strugg tide know reach shore
```

27.45 &#201; free delivery... , the moment struggl tide, know reach shore
anyon else!!!']

on a affich  les mots racine de 30 tweet

CountVectorizer permet de convertir un ensemble de documents textuels en une matrice de comptage de jetons

In [56]:

```
matrix =vectorizer.fit_transform(stem_data)  
print(matrix)
```

```
(0, 2460) 1  
(0, 13994) 1  
(0, 13126) 1  
(0, 13608) 1  
(0, 8101) 1  
(0, 2233) 1  
(1, 8598) 2  
(1, 14273) 1  
(2, 13994) 1  
(2, 3407) 1  
(2, 179) 1  
(2, 10121) 1  
(2, 2310) 1  
(2, 6209) 1  
(2, 11588) 1  
(3, 8744) 1  
(3, 2613) 1  
(3, 2591) 1  
(3, 14360) 1  
(3, 12902) 1  
(3, 14687) 1  
(3, 2897) 1  
(3, 1243) 1  
(4, 15453) 1  
(5, 13520) 1  
:  
:  
(14994, 5400) 1  
(14994, 4014) 1  
(14995, 15827) 1  
(14995, 6409) 1  
(14996, 14273) 1  
(14996, 5076) 1  
(14996, 8438) 1  
(14996, 14941) 2  
(14996, 2906) 1  
(14996, 10267) 1  
(14996, 3147) 1  
(14996, 963) 1  
(14996, 473) 1  
(14997, 1136) 1  
(14998, 6253) 1  
(14998, 10196) 1  
(14998, 3014) 1
```

```
(14998, 2906) 1
(14998, 10326) 1
(14998, 12543) 2
(14998, 5430) 1
(14998, 4840) 1
(14998, 3197) 1
(14998, 9860) 1
(14999, 14602) 1
```

chaque mot a été représenté sous forme d'un vecteur (indice de tweet, nombre d'occurrence de mot dans tout le dataset)

Partie III:Classification des tweets

tant donné un ensemble de tweets, l'objectif est de les résumer sous formes de groupes de sorte à ce que les Tweets qui sont dans le même groupe soient similaires. Ainsi, l'utilisateur pourra par la suite lire juste un Tweet de chaque groupe (le Tweet qui est le centroïde de groupes).

pour cela on va utiliser la classification k-means: C'est l'un des algorithmes de clustering les plus répandus. Il permet d'analyser un jeu de données caractérisées par un ensemble de descripteurs, afin de regrouper les données "similaires" en groupes (ou clusters). La similarité entre deux données peut être inférée grâce à la "distance" séparant leurs descripteurs ; ainsi deux données très similaires sont deux données dont les descripteurs sont très proches. Cette définition permet de formuler le problème de partitionnement des données comme la recherche de K "données prototypes", autour desquelles peuvent être regroupées les autres données.

on a utiliser l'algorithme K-Means pour classer les Tweets en 30 classes et on va ajouter les vecteurs resultatnt de CountVectorizer comme données pour êtres classifiées

In [57]:

```
from sklearn.cluster import KMeans
dist=[]
for i in range(1,30):
    Kmeans=KMeans(n_clusters=i,
                  init='k-means++', #selects initial cluster centers for
k-mean clustering in a smart way to speed up convergence.
                  random_state=0, #Determines random number generation f
or centroid initialization. Use an int to make the randomness determinis
tic
                  verbose=True)
    Kmeans.fit(matrix)
    dist.append(Kmeans.inertia_) #Sum of squared distances of samples to
their closest cluster center.
```

```
Initialization complete
Iteration 0, inertia 258674.0
Iteration 1, inertia 108645.48093333277
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 167430.0
Iteration 1, inertia 108645.48093333277
```


Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 196916.0
Iteration 1, inertia 108645.48093333277
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124456.0
Iteration 1, inertia 108645.48093333277
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 297234.0
Iteration 1, inertia 108645.48093333277
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 258186.0
Iteration 1, inertia 108645.48093333277
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 377152.0
Iteration 1, inertia 108645.48093333277
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 419934.0
Iteration 1, inertia 108645.48093333277
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 289268.0
Iteration 1, inertia 108645.48093333277
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 213102.0
Iteration 1, inertia 108645.48093333277
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 139284.0
Iteration 1, inertia 108635.47836522307
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 167410.0
Iteration 1, inertia 108629.62877525149
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 195160.0
Iteration 1, inertia 107828.78431164757
Iteration 2, inertia 107804.05664634662

```

Iteration 2, inertia 107803.78666829456
Iteration 3, inertia 107803.78666829456
Converged at iteration 3: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124438.0
Iteration 1, inertia 108600.71111514671
Iteration 2, inertia 108571.23703393662
Iteration 3, inertia 108551.10304264668
Iteration 4, inertia 108524.86955941476
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124314.0
Iteration 1, inertia 108623.04013868482
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 182651.0
Iteration 1, inertia 108624.08335000322
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 167150.0
Iteration 1, inertia 108627.57930528717
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 169151.0
Iteration 1, inertia 108624.72698179905
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 138840.0
Iteration 1, inertia 108633.43862924214
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 168514.0
Iteration 1, inertia 108552.8329296543
Iteration 2, inertia 108443.7361357166
Iteration 3, inertia 108393.50686717611
Iteration 4, inertia 108260.46437313112
Iteration 5, inertia 108188.42452282278
Iteration 6, inertia 108138.35994172643
Iteration 7, inertia 108121.25841404959
Iteration 8, inertia 108119.48937521467
Iteration 9, inertia 108117.39314261136
Iteration 10, inertia 108111.8661001254
Iteration 11, inertia 108076.7826740213
Iteration 12, inertia 108068.7153933025
Iteration 13, inertia 108068.50903692367
Iteration 14, inertia 108068.47160807486
Converged at iteration 14: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 122256.0

```

Iteration 0, inertia 139256.0
Iteration 1, inertia 108612.65760253309
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 166090.0
Iteration 1, inertia 108127.87153182308
Iteration 2, inertia 108057.96418751065
Iteration 3, inertia 108052.38262811807
Converged at iteration 3: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 195140.0
Iteration 1, inertia 107809.35213779612
Iteration 2, inertia 107782.26200445762
Iteration 3, inertia 107781.99201969277
Converged at iteration 3: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124395.0
Iteration 1, inertia 108526.52330622257
Iteration 2, inertia 108322.79621243944
Iteration 3, inertia 107978.5331005974
Iteration 4, inertia 107666.74462546676
Iteration 5, inertia 107666.71395318203
Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124303.0
Iteration 1, inertia 108613.11869040607
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 167623.0
Iteration 1, inertia 108510.2150771331
Iteration 2, inertia 108505.22204167282
Iteration 3, inertia 108499.78005063848
Iteration 4, inertia 108328.26238467995
Iteration 5, inertia 108150.41661321952
Iteration 6, inertia 108117.77573456099
Iteration 7, inertia 108110.87281376652
Iteration 8, inertia 108104.92483936822
Iteration 9, inertia 108061.02592558996
Iteration 10, inertia 108042.51436895142
Iteration 11, inertia 108042.00500425631
Iteration 12, inertia 108041.54784594713
Iteration 13, inertia 108041.29345536102
Iteration 14, inertia 108041.18643129928
Iteration 15, inertia 108041.09729094536
Iteration 16, inertia 108041.0701387753
Iteration 17, inertia 108041.06123945594
Converged at iteration 17: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 151849.0
Iteration 1, inertia 108281.50699784032

Iteration 2, inertia 108261.45264815312
Iteration 3, inertia 108243.47681163346
Iteration 4, inertia 108241.00271110778
Iteration 5, inertia 108240.91449069526
Iteration 6, inertia 108240.88688720565
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 169093.0
Iteration 1, inertia 108535.43149567538
Iteration 2, inertia 108351.72243736104
Iteration 3, inertia 108349.80083103779
Converged at iteration 3: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 138826.0
Iteration 1, inertia 108616.07735094063
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 167581.0
Iteration 1, inertia 108278.35380579607
Iteration 2, inertia 108155.16969721353
Iteration 3, inertia 108103.44190040555
Iteration 4, inertia 107963.7171863424
Iteration 5, inertia 107898.9032591721
Iteration 6, inertia 107851.48869012558
Iteration 7, inertia 107833.58267200853
Iteration 8, inertia 107832.11224386102
Iteration 9, inertia 107830.40360110479
Iteration 10, inertia 107828.85045816067
Iteration 11, inertia 107820.13931892723
Iteration 12, inertia 107789.42915588645
Iteration 13, inertia 107785.75064849416
Iteration 14, inertia 107785.68235685235
Converged at iteration 14: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 139242.0
Iteration 1, inertia 108600.85764305812
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124316.0
Iteration 1, inertia 107953.09322589319
Iteration 2, inertia 107167.29993734624
Iteration 3, inertia 107074.9421158937
Iteration 4, inertia 107074.77143273817
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 194070.0
Iteration 1, inertia 107538.51861620575
Iteration 2, inertia 107430.0078798845
Iteration 3, inertia 107424.2197823167
Iteration 4, inertia 107424.18130909963

Iteration 1, inertia 107122.00000000000
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124349.0
Iteration 1, inertia 108482.19307485221
Iteration 2, inertia 108278.47307546802
Iteration 3, inertia 107934.23188764365
Iteration 4, inertia 107622.43565605962
Iteration 5, inertia 107622.40498331726
Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124288.0
Iteration 1, inertia 108576.03950705656
Iteration 2, inertia 108573.3456527566
Iteration 3, inertia 108569.87567574478
Iteration 4, inertia 108565.55330220147
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 167596.0
Iteration 1, inertia 108358.50055992753
Iteration 2, inertia 108248.69441381452
Iteration 3, inertia 108240.98321104895
Iteration 4, inertia 108034.96786544629
Iteration 5, inertia 107407.8626425903
Iteration 6, inertia 107184.8791034705
Iteration 7, inertia 107178.32567057716
Iteration 8, inertia 107175.24906384322
Iteration 9, inertia 107164.38498756794
Iteration 10, inertia 107133.93840848307
Iteration 11, inertia 107132.94770580089
Iteration 12, inertia 107132.70052898156
Iteration 13, inertia 107132.6498714398
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 151819.0
Iteration 1, inertia 108158.30751247903
Iteration 2, inertia 108012.77846625945
Iteration 3, inertia 107994.27396377064
Iteration 4, inertia 107986.24479809302
Iteration 5, inertia 107902.31026939601
Iteration 6, inertia 107364.92950673365
Iteration 7, inertia 107336.9341080552
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 168231.0
Iteration 1, inertia 108293.298004148
Iteration 2, inertia 108115.12803117499
Iteration 3, inertia 108112.35405962226
Converged at iteration 3: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122722.0

Iteration 0, inertia 138796.0
Iteration 1, inertia 108467.9792097714
Iteration 2, inertia 108422.22821316692
Converged at iteration 2: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 153542.0
Iteration 1, inertia 107930.74895000343
Iteration 2, inertia 107788.27070816318
Iteration 3, inertia 107739.76147975234
Iteration 4, inertia 107586.20883535322
Iteration 5, inertia 107524.36715345136
Iteration 6, inertia 107479.03270413354
Iteration 7, inertia 107465.79654102081
Iteration 8, inertia 107464.55301458825
Iteration 9, inertia 107463.31875869427
Iteration 10, inertia 107462.47064331098
Iteration 11, inertia 107460.15511900633
Iteration 12, inertia 107436.75452307807
Iteration 13, inertia 107420.84517954926
Iteration 14, inertia 107420.41225446919
Iteration 15, inertia 107420.37365697864
Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 139182.0
Iteration 1, inertia 108549.31544362866
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124282.0
Iteration 1, inertia 107922.17872355218
Iteration 2, inertia 107137.58109156144
Iteration 3, inertia 107045.21508510267
Iteration 4, inertia 107045.04410703418
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 194049.0
Iteration 1, inertia 107522.60264154909
Iteration 2, inertia 107414.55465917075
Iteration 3, inertia 107408.25485969694
Iteration 4, inertia 107408.21630803979
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124299.0
Iteration 1, inertia 108434.2447259327
Iteration 2, inertia 108230.52759922118
Iteration 3, inertia 107886.29670704486
Iteration 4, inertia 107574.49655733079
Iteration 5, inertia 107574.46588436152
Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124274.0

Iteration 1, inertia 108563.08482274895
Iteration 2, inertia 108560.39096965587
Iteration 3, inertia 108556.92101270136
Iteration 4, inertia 108552.59863900082
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 139242.0
Iteration 1, inertia 107750.79854936057
Iteration 2, inertia 107624.07739986888
Iteration 3, inertia 107521.01687190575
Iteration 4, inertia 107513.18438085887
Iteration 5, inertia 107470.17176054325
Iteration 6, inertia 107078.40788897773
Iteration 7, inertia 106751.33270086658
Iteration 8, inertia 106684.4196086365
Iteration 9, inertia 106668.81432381505
Iteration 10, inertia 106567.87471327579
Iteration 11, inertia 106180.54645685494
Iteration 12, inertia 106136.68345175686
Iteration 13, inertia 106134.26462865864
Iteration 14, inertia 106134.13649397733
Converged at iteration 14: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 151685.0
Iteration 1, inertia 107995.18543144366
Iteration 2, inertia 107828.60587677319
Iteration 3, inertia 107761.01744836327
Iteration 4, inertia 107371.97549169132
Iteration 5, inertia 107326.58607015356
Iteration 6, inertia 106904.50981659615
Iteration 7, inertia 106754.98571267861
Iteration 8, inertia 106754.72499682962
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 138985.0
Iteration 1, inertia 108211.02526062998
Iteration 2, inertia 108027.50413670744
Iteration 3, inertia 108022.40208134473
Iteration 4, inertia 108022.10795785034
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 138777.0
Iteration 1, inertia 108451.1513702022
Iteration 2, inertia 108405.40037353248
Converged at iteration 2: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 153457.0
Iteration 1, inertia 107885.09962310127
Iteration 2, inertia 107740.2382423693
Iteration 3, inertia 107675.12238907012
Iteration 4, inertia 107507.11245322939

Iteration 5, inertia 107447.95614880459
Iteration 6, inertia 107405.84618671381
Iteration 7, inertia 107396.80105912469
Iteration 8, inertia 107396.57286887584
Iteration 9, inertia 107396.17780173186
Iteration 10, inertia 107395.56384978394
Iteration 11, inertia 107394.59739381951
Iteration 12, inertia 107393.75116487028
Iteration 13, inertia 107391.43501803261
Iteration 14, inertia 107368.04121791956
Iteration 15, inertia 107352.13025283968
Iteration 16, inertia 107351.69721986825
Iteration 17, inertia 107351.65861947741
Converged at iteration 17: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 139119.0
Iteration 1, inertia 108492.89656035177
Converged at iteration 1: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124149.0
Iteration 1, inertia 107797.86297966179
Iteration 2, inertia 107013.27200589764
Iteration 3, inertia 106920.89769903326
Iteration 4, inertia 106920.72672096478
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 193279.0
Iteration 1, inertia 107129.44012307486
Iteration 2, inertia 107006.19421373322
Iteration 3, inertia 106992.68874734893
Iteration 4, inertia 106983.03511051148
Iteration 5, inertia 106982.50947751441
Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124275.0
Iteration 1, inertia 108384.96585217952
Iteration 2, inertia 108184.08015012692
Iteration 3, inertia 107840.78566340855
Iteration 4, inertia 107528.6963499792
Iteration 5, inertia 107528.66561178409
Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124261.0
Iteration 1, inertia 108551.05203094915
Iteration 2, inertia 108548.35817385721
Iteration 3, inertia 108544.88822653852
Iteration 4, inertia 108540.56585268157
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122707.0

Iteration 0, inertia 138797.0
Iteration 1, inertia 107525.5627636438
Iteration 2, inertia 107402.68945181684
Iteration 3, inertia 107299.41124717848
Iteration 4, inertia 107291.63772202523
Iteration 5, inertia 107252.48769775753
Iteration 6, inertia 106901.22529119816
Iteration 7, inertia 106548.90229371742
Iteration 8, inertia 106482.61543602793
Iteration 9, inertia 106478.47757337209
Iteration 10, inertia 106456.12031957437
Iteration 11, inertia 106281.58789308861
Iteration 12, inertia 105980.83121960031
Iteration 13, inertia 105936.78900907794
Iteration 14, inertia 105934.3815182889
Iteration 15, inertia 105934.25258353403
Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 151670.0
Iteration 1, inertia 107983.163685627
Iteration 2, inertia 107816.58401283795
Iteration 3, inertia 107748.9976025286
Iteration 4, inertia 107359.9552450243
Iteration 5, inertia 107314.56786573616
Iteration 6, inertia 106892.49446207634
Iteration 7, inertia 106742.96892889815
Iteration 8, inertia 106742.70821291488
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 138781.0
Iteration 1, inertia 107702.22903287917
Iteration 2, inertia 107132.26297038757
Iteration 3, inertia 107125.16784628559
Iteration 4, inertia 107124.30932385112
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 138400.0
Iteration 1, inertia 108102.89860945575
Iteration 2, inertia 108051.9090916656
Converged at iteration 2: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 138610.0
Iteration 1, inertia 107992.83947475864
Iteration 2, inertia 107780.09602379138
Iteration 3, inertia 107656.11641421921
Iteration 4, inertia 107646.08937035162
Iteration 5, inertia 107645.00360946634
Iteration 6, inertia 107644.16186030603
Iteration 7, inertia 107643.0240938197
Iteration 8, inertia 107640.39916075092
Iteration 9, inertia 107635.93588466223
Iteration 10, inertia 107633.31136660313

Iteration 11, inertia 107629.70467594167
Iteration 12, inertia 107628.54095460026
Iteration 13, inertia 107626.74588291485
Iteration 14, inertia 107625.64470300135
Iteration 15, inertia 107622.47674918536
Iteration 16, inertia 107619.59921750442
Iteration 17, inertia 107616.34630975546
Converged at iteration 17: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 139067.0
Iteration 1, inertia 108422.6922558468
Iteration 2, inertia 108411.66231167821
Iteration 3, inertia 108333.1743681676
Iteration 4, inertia 108308.14224469586
Iteration 5, inertia 108304.6514034174
Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124134.0
Iteration 1, inertia 107783.97191739519
Iteration 2, inertia 106998.37101083288
Iteration 3, inertia 106905.99278640724
Iteration 4, inertia 106905.82165914204
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 180474.0
Iteration 1, inertia 106784.94296806905
Iteration 2, inertia 106645.41163149504
Iteration 3, inertia 106628.96576861948
Iteration 4, inertia 106604.39267402126
Iteration 5, inertia 106578.26110910816
Iteration 6, inertia 106577.1332909145
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124261.0
Iteration 1, inertia 108372.17213203305
Iteration 2, inertia 108171.28739511475
Iteration 3, inertia 107827.99147229071
Iteration 4, inertia 107515.89987352613
Iteration 5, inertia 107515.86913521793
Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 124227.0
Iteration 1, inertia 108519.32268080705
Iteration 2, inertia 108516.62883814535
Iteration 3, inertia 108513.15895497322
Iteration 4, inertia 108508.83658080899
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 138675.0
Iteration 1, inertia 107259.59460043756

Iteration 2, inertia 106595.96969936871
Iteration 3, inertia 106491.49912544744
Iteration 4, inertia 106488.50698624997
Iteration 5, inertia 106472.04129897199
Iteration 6, inertia 106186.95449083795
Iteration 7, inertia 105906.60918104449
Iteration 8, inertia 105906.43633310939
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 151652.0
Iteration 1, inertia 107958.51718235624
Iteration 2, inertia 107791.93719935851
Iteration 3, inertia 107724.35362247728
Iteration 4, inertia 107335.31077073768
Iteration 5, inertia 107289.92242011883
Iteration 6, inertia 106867.85266746902
Iteration 7, inertia 106718.32462568427
Iteration 8, inertia 106718.06390939864
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 138749.0
Iteration 1, inertia 107674.40139925995
Iteration 2, inertia 107104.43009543179
Iteration 3, inertia 107097.33492408964
Iteration 4, inertia 107096.47640150953
Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 138257.0
Iteration 1, inertia 108038.90029520846
Iteration 2, inertia 107984.70060544672
Converged at iteration 2: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 138400.0
Iteration 1, inertia 107802.95733251923
Iteration 2, inertia 107590.22805876183
Iteration 3, inertia 107466.24343401578
Iteration 4, inertia 107456.21641623856
Iteration 5, inertia 107455.13061335149
Iteration 6, inertia 107454.28889280203
Iteration 7, inertia 107453.15108437132
Iteration 8, inertia 107450.52609327862
Iteration 9, inertia 107446.06266021615
Iteration 10, inertia 107443.43800880988
Iteration 11, inertia 107439.83120749873
Iteration 12, inertia 107438.66748557474
Iteration 13, inertia 107436.87218119013
Iteration 14, inertia 107435.77078661675
Iteration 15, inertia 107432.6026241632
Iteration 16, inertia 107429.72509156723
Iteration 17, inertia 107426.47218381824
Converged at iteration 17: center shift 0.0 within tolerance 4.518704886
202502e-08

2.02502e-08

Initialization complete

Iteration 0, inertia 137811.0

Iteration 1, inertia 107576.00553869735

Iteration 2, inertia 107118.2068314162

Iteration 3, inertia 107023.41705185136

Iteration 4, inertia 107007.81255170474

Iteration 5, inertia 107004.81261512497

Iteration 6, inertia 107004.26549883085

Iteration 7, inertia 107002.41347693678

Iteration 8, inertia 106999.86552855554

Iteration 9, inertia 106999.78077381352

Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 164278.0

Iteration 1, inertia 106982.19704054354

Iteration 2, inertia 106783.30098040278

Iteration 3, inertia 106778.1914670915

Iteration 4, inertia 106776.82751314623

Iteration 5, inertia 106775.95666807157

Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 109186.0

Iteration 1, inertia 108136.81890295446

Iteration 2, inertia 107678.68154804269

Iteration 3, inertia 107653.13538483676

Iteration 4, inertia 107280.40275585247

Iteration 5, inertia 106652.9919381146

Iteration 6, inertia 106412.97052499445

Iteration 7, inertia 106412.78496200584

Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 124169.0

Iteration 1, inertia 108062.26969488045

Iteration 2, inertia 107805.20971943496

Iteration 3, inertia 107793.88287422061

Iteration 4, inertia 107571.79542753649

Iteration 5, inertia 107141.42614619562

Iteration 6, inertia 107141.32672569121

Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 122731.0

Iteration 1, inertia 107149.30048174819

Iteration 2, inertia 107001.55617368668

Iteration 3, inertia 106855.34091445283

Iteration 4, inertia 106850.34826794713

Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 123932.0

Iteration 1, inertia 107830.43926179854

Iteration 2, inertia 107734.42180280949

Iteration 3, inertia 107288.1249895241
Iteration 4, inertia 107264.19493949911
Iteration 5, inertia 107263.08967538661
Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 137032.0
Iteration 1, inertia 107129.89736029593
Iteration 2, inertia 106774.54893892149
Iteration 3, inertia 106770.02139701447
Converged at iteration 3: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123030.0
Iteration 1, inertia 107341.34373199727
Iteration 2, inertia 107050.95252668824
Iteration 3, inertia 106762.47251271999
Iteration 4, inertia 106760.72598212247
Iteration 5, inertia 106759.03990820335
Iteration 6, inertia 106757.51542226522
Iteration 7, inertia 106756.66219221705
Iteration 8, inertia 106755.79380135551
Iteration 9, inertia 106747.75104408742
Iteration 10, inertia 106701.8108271246
Iteration 11, inertia 106693.61225308674
Iteration 12, inertia 106693.24494899815
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 123907.0
Iteration 1, inertia 107987.75238354324
Iteration 2, inertia 107778.7183184091
Iteration 3, inertia 107750.53572933502
Iteration 4, inertia 107746.7386279344
Iteration 5, inertia 107722.89475468356
Iteration 6, inertia 107507.98960757848
Iteration 7, inertia 107359.63369822552
Iteration 8, inertia 107357.47939584928
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 136347.0
Iteration 1, inertia 107251.43348071277
Iteration 2, inertia 107187.27625589605
Iteration 3, inertia 106965.14490132521
Iteration 4, inertia 106806.59535832285
Iteration 5, inertia 106798.89900928503
Iteration 6, inertia 106798.4489693452
Iteration 7, inertia 106798.33916891777
Iteration 8, inertia 106797.99971390134
Iteration 9, inertia 106797.88529964369
Iteration 10, inertia 106797.86620344082
Iteration 11, inertia 106797.84781883263
Iteration 12, inertia 106797.82870250077
Iteration 13, inertia 106797.78601171027
Iteration 14, inertia 106797.74971264026

Converged at iteration 14: center shift 0.0 within tolerance 4.518704886
82502e-08

Initialization complete

Iteration 0, inertia 137755.0
Iteration 1, inertia 107449.52671147234
Iteration 2, inertia 106868.39113335498
Iteration 3, inertia 106782.58723102308
Iteration 4, inertia 106768.69583411637
Iteration 5, inertia 106765.71310789842
Iteration 6, inertia 106765.16584328205
Iteration 7, inertia 106763.3045785972
Iteration 8, inertia 106760.75585091466
Iteration 9, inertia 106760.67097731188

Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 137755.0
Iteration 1, inertia 106348.53707809577
Iteration 2, inertia 105947.64161669333
Iteration 3, inertia 105944.0821222212
Iteration 4, inertia 105942.45733701088
Iteration 5, inertia 105942.4013408027
Iteration 6, inertia 105942.358547779
Iteration 7, inertia 105942.32567715715

Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 109150.0
Iteration 1, inertia 108100.948433427
Iteration 2, inertia 107642.81116252547
Iteration 3, inertia 107617.26601269466
Iteration 4, inertia 107244.54702117735
Iteration 5, inertia 106617.1341958811
Iteration 6, inertia 106377.10712980824
Iteration 7, inertia 106376.92156642555

Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 124154.0
Iteration 1, inertia 108048.42224967974
Iteration 2, inertia 107791.3609218224
Iteration 3, inertia 107780.02733315168
Iteration 4, inertia 107558.16239866403
Iteration 5, inertia 107128.44068612198
Iteration 6, inertia 107128.34120795772

Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 122699.0
Iteration 1, inertia 107119.49815439092
Iteration 2, inertia 106971.7545959911
Iteration 3, inertia 106825.54136297555
Iteration 4, inertia 106820.54871413871

Converged at iteration 4: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Initialization complete

Iteration 0, inertia 123915.0

Iteration 1, inertia 107814.56116590869

Iteration 2, inertia 107718.50310467389

Iteration 3, inertia 107272.99760406271

Iteration 4, inertia 107249.14473662288

Iteration 5, inertia 107248.03943456052

Converged at iteration 5: center shift 0.0 within tolerance 4.518704886282502e-08

Initialization complete

Iteration 0, inertia 136980.0

Iteration 1, inertia 107081.91453993197

Iteration 2, inertia 106726.56363105388

Iteration 3, inertia 106722.03607527308

Converged at iteration 3: center shift 0.0 within tolerance 4.518704886282502e-08

Initialization complete

Iteration 0, inertia 123015.0

Iteration 1, inertia 107327.4441412511

Iteration 2, inertia 107037.05692863352

Iteration 3, inertia 106748.57543812033

Iteration 4, inertia 106746.8290920148

Iteration 5, inertia 106745.14318821678

Iteration 6, inertia 106743.6188050808

Iteration 7, inertia 106742.76553917005

Iteration 8, inertia 106741.89731492927

Iteration 9, inertia 106733.85533342596

Iteration 10, inertia 106687.9160894341

Iteration 11, inertia 106679.71833858544

Iteration 12, inertia 106679.35103367515

Converged at iteration 12: center shift 0.0 within tolerance 4.518704886282502e-08

Initialization complete

Iteration 0, inertia 123885.0

Iteration 1, inertia 107966.93136678652

Iteration 2, inertia 107757.89630557534

Iteration 3, inertia 107729.7137779886

Iteration 4, inertia 107725.91680660074

Iteration 5, inertia 107702.07238937033

Iteration 6, inertia 107487.16775582511

Iteration 7, inertia 107338.81079234247

Iteration 8, inertia 107336.65648670666

Converged at iteration 8: center shift 0.0 within tolerance 4.518704886282502e-08

Initialization complete

Iteration 0, inertia 135796.0

Iteration 1, inertia 107086.7578746015

Iteration 2, inertia 107022.30804914873

Iteration 3, inertia 106795.23721750751

Iteration 4, inertia 106637.92647766731

Iteration 5, inertia 106630.68630359258

Iteration 6, inertia 106630.21604772584

Iteration 7, inertia 106630.07964858353

Iteration 8, inertia 106629.74627653306

Iteration 9, inertia 106629.63602017125

Iteration 10, inertia 106629.61722278128

Converged at iteration 10: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 137444.0
Iteration 1, inertia 107132.43966679856
Iteration 2, inertia 106558.46231872143
Iteration 3, inertia 106475.58765212506
Iteration 4, inertia 106462.69832808206
Iteration 5, inertia 106459.86279887315
Iteration 6, inertia 106459.19839777224
Iteration 7, inertia 106457.42507189051
Iteration 8, inertia 106454.83561684155
Iteration 9, inertia 106454.65738033198

Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 137696.0
Iteration 1, inertia 106291.94601891417
Iteration 2, inertia 105891.04833171114
Iteration 3, inertia 105887.48889861036
Iteration 4, inertia 105885.8641132631
Iteration 5, inertia 105885.80811705491
Iteration 6, inertia 105885.76532403122
Iteration 7, inertia 105885.73245340936

Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 109133.0
Iteration 1, inertia 108076.62459663491
Iteration 2, inertia 107618.4875104759
Iteration 3, inertia 107592.94649336585
Iteration 4, inertia 107220.24528863847
Iteration 5, inertia 106592.83903296973
Iteration 6, inertia 106352.8066940243
Iteration 7, inertia 106352.62113024892

Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 124024.0
Iteration 1, inertia 107653.30045860611
Iteration 2, inertia 107372.54789619872
Iteration 3, inertia 107357.69916276188
Iteration 4, inertia 107083.40206615921
Iteration 5, inertia 106706.5428788911
Iteration 6, inertia 106703.13301052785

Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 122350.0
Iteration 1, inertia 106767.30308679988
Iteration 2, inertia 106639.732924334
Iteration 3, inertia 106485.7301118955
Iteration 4, inertia 106480.53229176036
Iteration 5, inertia 106480.45036057687

Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete
Iteration 0, inertia 123886.0
Iteration 1, inertia 107787.48783271312
Iteration 2, inertia 107691.42388721324
Iteration 3, inertia 107245.91838660205
Iteration 4, inertia 107222.06551916218
Iteration 5, inertia 107220.96021709984
Converged at iteration 5: center shift 0.0 within tolerance 4.518704886282502e-08

Initialization complete
Iteration 0, inertia 136950.0
Iteration 1, inertia 106885.88694515434
Iteration 2, inertia 106477.7592623588
Iteration 3, inertia 106429.64370878438
Iteration 4, inertia 106000.56464817027
Iteration 5, inertia 105900.87687679542
Iteration 6, inertia 105900.83528661143
Converged at iteration 6: center shift 0.0 within tolerance 4.518704886282502e-08

Initialization complete
Iteration 0, inertia 122977.0
Iteration 1, inertia 107288.41940590367
Iteration 2, inertia 106996.84009250249
Iteration 3, inertia 106662.42051943157
Iteration 4, inertia 106128.2370903117
Iteration 5, inertia 105890.04910212426
Iteration 6, inertia 105887.26667082922
Iteration 7, inertia 105886.60950074393
Iteration 8, inertia 105886.19199963336
Iteration 9, inertia 105885.71775684299
Iteration 10, inertia 105882.01711004706
Iteration 11, inertia 105850.84356065399
Iteration 12, inertia 105846.93530275792
Iteration 13, inertia 105846.48742809871
Iteration 14, inertia 105846.30360084256
Iteration 15, inertia 105846.28546657458
Converged at iteration 15: center shift 0.0 within tolerance 4.518704886282502e-08

Initialization complete
Iteration 0, inertia 123832.0
Iteration 1, inertia 107904.28622395413
Iteration 2, inertia 107694.19319561869
Iteration 3, inertia 107666.01121003692
Iteration 4, inertia 107662.21731750482
Iteration 5, inertia 107638.3760072993
Iteration 6, inertia 107424.24704169523
Iteration 7, inertia 107276.28647532153
Iteration 8, inertia 107274.1281867467
Converged at iteration 8: center shift 0.0 within tolerance 4.518704886282502e-08

Initialization complete
Iteration 0, inertia 135459.0
Iteration 1, inertia 106856.5729694212
Iteration 2, inertia 106763.30881156513
Iteration 3, inertia 106536.06462653405
Iteration 4, inertia 106384.09060189014

Iteration 4, inertia 106377.08118434012
Iteration 5, inertia 106377.08118434012
Iteration 6, inertia 106376.62047203197
Iteration 7, inertia 106376.58278461745
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 135893.0
Iteration 1, inertia 106751.52851064515
Iteration 2, inertia 106194.58669000873
Iteration 3, inertia 106168.6252074431
Iteration 4, inertia 106163.14236268912
Iteration 5, inertia 106157.71619407802
Iteration 6, inertia 106157.67187215334
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 137670.0
Iteration 1, inertia 106291.40829372959
Iteration 2, inertia 105861.58996204457
Iteration 3, inertia 105855.3697099633
Iteration 4, inertia 105851.32051549177
Iteration 5, inertia 105850.72918541331
Iteration 6, inertia 105850.66968462053
Iteration 7, inertia 105850.6235049904
Iteration 8, inertia 105850.60035271673
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 109103.0
Iteration 1, inertia 108014.49082856071
Iteration 2, inertia 107497.55352509492
Iteration 3, inertia 107319.65989869893
Iteration 4, inertia 106678.29879957296
Iteration 5, inertia 106084.18048857263
Iteration 6, inertia 105844.08392240277
Iteration 7, inertia 105843.84108929824
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123986.0
Iteration 1, inertia 107527.60836317377
Iteration 2, inertia 107004.88806502652
Iteration 3, inertia 106863.59454156544
Iteration 4, inertia 106560.03700412226
Iteration 5, inertia 106231.36396413024
Iteration 6, inertia 106227.90405223545
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 121896.0
Iteration 1, inertia 106500.6025993882
Iteration 2, inertia 106367.68703753983
Iteration 3, inertia 106183.32383950378
Iteration 4, inertia 106166.19179383063
Iteration 5, inertia 106165.92342670761

Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123870.0
Iteration 1, inertia 107772.61894907943
Iteration 2, inertia 107676.55841419152
Iteration 3, inertia 107231.05115082643
Iteration 4, inertia 107207.19801206331
Iteration 5, inertia 107206.09271000096
Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 136929.0
Iteration 1, inertia 106835.03444618396
Iteration 2, inertia 106425.11945571248
Iteration 3, inertia 106370.73047094219
Iteration 4, inertia 105923.0206429206
Iteration 5, inertia 105761.1230205165
Iteration 6, inertia 105616.51231414225
Iteration 7, inertia 105615.6235439288
Iteration 8, inertia 105615.40297610938
Iteration 9, inertia 105615.24821067977
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122881.0
Iteration 1, inertia 107168.35332908221
Iteration 2, inertia 106876.80023288981
Iteration 3, inertia 106542.3749251628
Iteration 4, inertia 106008.23672710013
Iteration 5, inertia 105770.03691605956
Iteration 6, inertia 105767.25514292232
Iteration 7, inertia 105766.59845463891
Iteration 8, inertia 105766.18137118315
Iteration 9, inertia 105765.70704863899
Iteration 10, inertia 105762.01020994771
Iteration 11, inertia 105730.83769616144
Iteration 12, inertia 105726.92957744988
Iteration 13, inertia 105726.4821695242
Iteration 14, inertia 105726.29827195109
Iteration 15, inertia 105726.28013742277
Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 123816.0
Iteration 1, inertia 107889.36921691394
Iteration 2, inertia 107679.27627225571
Iteration 3, inertia 107651.09433871943
Iteration 4, inertia 107647.3003822894
Iteration 5, inertia 107623.45981015709
Iteration 6, inertia 107409.33152011951
Iteration 7, inertia 107261.37055093363
Iteration 8, inertia 107259.21225861242
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete

Iteration 0, inertia 135431.0
Iteration 1, inertia 106686.51079990808
Iteration 2, inertia 106342.50396647824
Iteration 3, inertia 106325.19171713128
Iteration 4, inertia 106320.81193820678
Iteration 5, inertia 106317.59567497487
Iteration 6, inertia 106316.49938573407
Iteration 7, inertia 106316.34924198578
Iteration 8, inertia 106316.29596279835
Iteration 9, inertia 106316.18015689604
Iteration 10, inertia 106315.96327206219
Iteration 11, inertia 106315.75790059463
Iteration 12, inertia 106315.4681330876
Iteration 13, inertia 106314.91387687284
Iteration 14, inertia 106313.95755043013
Iteration 15, inertia 106312.60583318099
Iteration 16, inertia 106311.86671238179
Iteration 17, inertia 106311.47709705787
Iteration 18, inertia 106311.42906084166
Converged at iteration 18: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 135798.0
Iteration 1, inertia 106708.64253884056
Iteration 2, inertia 106151.35969733365
Iteration 3, inertia 106123.06065093724
Iteration 4, inertia 106114.56413110794
Iteration 5, inertia 106107.99177330137
Iteration 6, inertia 106107.94745137669
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 136227.0
Iteration 1, inertia 105959.10866031866
Iteration 2, inertia 105511.74795057363
Iteration 3, inertia 105502.45528900741
Iteration 4, inertia 105498.52421429714
Iteration 5, inertia 105497.91992094424
Iteration 6, inertia 105497.87041362871
Iteration 7, inertia 105497.84638273624
Iteration 8, inertia 105497.80630611593
Iteration 9, inertia 105497.79314785032
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 109015.0
Iteration 1, inertia 107687.83780886687
Iteration 2, inertia 106694.33424726996
Iteration 3, inertia 106537.09139648221
Iteration 4, inertia 105954.26733566058
Iteration 5, inertia 105500.90942510679
Iteration 6, inertia 105121.50340905113
Iteration 7, inertia 105120.99111355151
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Initialization complete

Iteration 0, inertia 123814.0

Iteration 1, inertia 107342.08126837997

Iteration 2, inertia 106822.86172350362

Iteration 3, inertia 106681.58622653643

Iteration 4, inertia 106378.1145100117

Iteration 5, inertia 106049.36456785104

Iteration 6, inertia 106045.90389082865

Converged at iteration 6: center shift 0.0 within tolerance 4.518704886282502e-08

Initialization complete

Iteration 0, inertia 121804.0

Iteration 1, inertia 106435.53826021923

Iteration 2, inertia 106298.74404344472

Iteration 3, inertia 106092.02955613472

Iteration 4, inertia 106048.18300183267

Iteration 5, inertia 106035.67719333952

Iteration 6, inertia 106027.72833105504

Iteration 7, inertia 105989.97002242661

Iteration 8, inertia 105982.99455718424

Converged at iteration 8: center shift 0.0 within tolerance 4.518704886282502e-08

Initialization complete

Iteration 0, inertia 123814.0

Iteration 1, inertia 107721.07746540887

Iteration 2, inertia 107625.02830102039

Iteration 3, inertia 107179.7016824747

Iteration 4, inertia 107155.66963530517

Iteration 5, inertia 107154.56433324282

Converged at iteration 5: center shift 0.0 within tolerance 4.518704886282502e-08

Initialization complete

Iteration 0, inertia 136531.0

Iteration 1, inertia 106643.27259521758

Iteration 2, inertia 106235.52709414603

Iteration 3, inertia 106188.96090752711

Iteration 4, inertia 105771.68070668651

Iteration 5, inertia 105645.8320982803

Iteration 6, inertia 105477.32698777418

Iteration 7, inertia 105445.46326081164

Iteration 8, inertia 105444.97686284687

Iteration 9, inertia 105444.70946357021

Iteration 10, inertia 105444.62243170025

Converged at iteration 10: center shift 0.0 within tolerance 4.518704886282502e-08

Initialization complete

Iteration 0, inertia 122865.0

Iteration 1, inertia 107153.37498661927

Iteration 2, inertia 106861.82505923716

Iteration 3, inertia 106527.39980119489

Iteration 4, inertia 105993.26701452053

Iteration 5, inertia 105755.06457954847

Iteration 6, inertia 105752.28269987048

Iteration 7, inertia 105751.62573695525

Iteration 8, inertia 105751.20869054353

Iteration 9, inertia 105750.73442164643

Iteration 10, inertia 105749.88867881555

Iteration 10, inertia 105747.03767912505
Iteration 11, inertia 105715.86521742093
Iteration 12, inertia 105711.95701486779
Iteration 13, inertia 105711.50957814191
Iteration 14, inertia 105711.32567548909
Iteration 15, inertia 105711.3075409156
Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 123760.0
Iteration 1, inertia 107837.28727767852
Iteration 2, inertia 107627.19608452304
Iteration 3, inertia 107599.01430585657
Iteration 4, inertia 107595.22042514678
Iteration 5, inertia 107571.38272573135
Iteration 6, inertia 107357.26096844109
Iteration 7, inertia 107209.29703838564
Iteration 8, inertia 107207.13873211505
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122376.0
Iteration 1, inertia 106652.510312725
Iteration 2, inertia 106150.0464682471
Iteration 3, inertia 106129.91556931759
Iteration 4, inertia 106125.48826156605
Iteration 5, inertia 106122.27123555039
Iteration 6, inertia 106121.17290635244
Iteration 7, inertia 106121.02488425218
Iteration 8, inertia 106120.97998950844
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 135767.0
Iteration 1, inertia 106679.83746002214
Iteration 2, inertia 106122.55255733932
Iteration 3, inertia 106094.25406368151
Iteration 4, inertia 106085.75836326426
Iteration 5, inertia 106079.18599751209
Iteration 6, inertia 106079.14167558741
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 136029.0
Iteration 1, inertia 105797.94350840691
Iteration 2, inertia 105350.39325396111
Iteration 3, inertia 105341.16453346371
Iteration 4, inertia 105337.32850564978
Iteration 5, inertia 105336.63346092738
Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 108958.0
Iteration 1, inertia 107533.53406007883
Iteration 2, inertia 106140.86783708856
Iteration 3, inertia 105899.15558882106

Iteration 4, inertia 105374.27131320674
Iteration 5, inertia 105104.10526612109
Iteration 6, inertia 105090.19922288746
Iteration 7, inertia 105090.13382338457
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123781.0
Iteration 1, inertia 107312.68209132682
Iteration 2, inertia 106793.4592491269
Iteration 3, inertia 106652.16257844928
Iteration 4, inertia 106348.72107655383
Iteration 5, inertia 106019.96658286697
Iteration 6, inertia 106016.50590280586
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 121776.0
Iteration 1, inertia 106409.59952899377
Iteration 2, inertia 106272.80557022379
Iteration 3, inertia 106066.09154283181
Iteration 4, inertia 106022.24489868624
Iteration 5, inertia 106009.73902859006
Iteration 6, inertia 106001.79019044264
Iteration 7, inertia 105964.03159609954
Iteration 8, inertia 105957.05612735651
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123488.0
Iteration 1, inertia 107399.04238306137
Iteration 2, inertia 107331.39720150287
Iteration 3, inertia 106910.26311020402
Iteration 4, inertia 106847.57747969241
Iteration 5, inertia 106846.47165705438
Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 136494.0
Iteration 1, inertia 106603.35822024161
Iteration 2, inertia 106189.19072688918
Iteration 3, inertia 106132.26875220664
Iteration 4, inertia 105646.86094657615
Iteration 5, inertia 105517.6559625777
Iteration 6, inertia 105350.20654850618
Iteration 7, inertia 105317.98455792201
Iteration 8, inertia 105317.49127252543
Iteration 9, inertia 105317.22362128172
Iteration 10, inertia 105317.1365894118
Converged at iteration 10: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 122774.0
Iteration 1, inertia 107076.29596713558
Iteration 2, inertia 106785.21536551585
Iteration 3, inertia 106449.20695991145

Iteration 5, inertia 105915.31054199961
Iteration 6, inertia 105677.6836559084
Iteration 7, inertia 105675.17829313071
Iteration 8, inertia 105674.02666333361
Iteration 9, inertia 105673.72036152826
Iteration 10, inertia 105673.40125841227
Iteration 11, inertia 105673.07613650536
Iteration 12, inertia 105672.39827853905
Iteration 13, inertia 105655.76118988478
Iteration 14, inertia 105634.8315863829
Iteration 15, inertia 105634.24631372144
Iteration 16, inertia 105633.9509545824
Iteration 17, inertia 105633.87531323374
Converged at iteration 16: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 123560.0
Iteration 1, inertia 107647.39162172913
Iteration 2, inertia 107437.30726918469
Iteration 3, inertia 107409.12593061975
Iteration 4, inertia 107405.33382670244
Iteration 5, inertia 107381.50466644239
Iteration 6, inertia 107167.41283484148
Iteration 7, inertia 107019.44015119082
Iteration 8, inertia 107017.28181124723
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 122277.0
Iteration 1, inertia 106253.13095143712
Iteration 2, inertia 105333.86209407057
Iteration 3, inertia 105307.34057148342
Iteration 4, inertia 105269.07323058318
Iteration 5, inertia 105240.68408526407
Iteration 6, inertia 105239.1019433297
Iteration 7, inertia 105238.76604967777
Iteration 8, inertia 105238.64513204704
Iteration 9, inertia 105238.58991088485
Iteration 10, inertia 105238.55316404872
Iteration 11, inertia 105238.35816416907
Iteration 12, inertia 105238.11838506487
Iteration 13, inertia 105237.45098458139
Iteration 14, inertia 105236.75100014602
Iteration 15, inertia 105236.14213857731
Iteration 16, inertia 105235.53771305272
Iteration 17, inertia 105235.20072894206
Iteration 18, inertia 105234.94706209969
Iteration 19, inertia 105234.86809080344
Converged at iteration 19: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 135617.0
Iteration 1, inertia 106489.07452107414
Iteration 2, inertia 105902.09199506063
Iteration 3, inertia 105873.79046820606
Iteration 4, inertia 105865.00067300530

Iteration 4, inertia 105865.29367320538
Iteration 5, inertia 105858.72122440921
Iteration 6, inertia 105858.67690248451
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 135959.0
Iteration 1, inertia 105744.0971868114
Iteration 2, inertia 105296.44136570308
Iteration 3, inertia 105287.3358522072
Iteration 4, inertia 105283.44142983676
Iteration 5, inertia 105282.67603252588
Iteration 6, inertia 105282.62933728562
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 108945.0
Iteration 1, inertia 107520.53123959174
Iteration 2, inertia 106127.86584701015
Iteration 3, inertia 105886.15450367457
Iteration 4, inertia 105361.27296168785
Iteration 5, inertia 105091.10516482161
Iteration 6, inertia 105077.19912158798
Iteration 7, inertia 105077.13372208513
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123705.0
Iteration 1, inertia 107242.95232070792
Iteration 2, inertia 106727.10181003725
Iteration 3, inertia 106585.79650818901
Iteration 4, inertia 106282.28562366034
Iteration 5, inertia 105953.59944508743
Iteration 6, inertia 105950.11168423074
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 121736.0
Iteration 1, inertia 106372.35732924468
Iteration 2, inertia 106235.56128466729
Iteration 3, inertia 106028.8452008973
Iteration 4, inertia 105985.00121160912
Iteration 5, inertia 105972.49495334143
Iteration 6, inertia 105964.54581162012
Iteration 7, inertia 105926.7885373455
Iteration 8, inertia 105919.81306387957
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123471.0
Iteration 1, inertia 107383.73068733753
Iteration 2, inertia 107316.1610856839
Iteration 3, inertia 106895.02366729597
Iteration 4, inertia 106832.33766161598
Iteration 5, inertia 106831.23183897798
Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862

82502e-08

Initialization complete

Iteration 0, inertia 136391.0

Iteration 1, inertia 106541.47188731976

Iteration 2, inertia 106128.8916066868

Iteration 3, inertia 106071.52000568373

Iteration 4, inertia 105588.24391626027

Iteration 5, inertia 105459.14056323106

Iteration 6, inertia 105293.47933883543

Iteration 7, inertia 105262.7252478354

Iteration 8, inertia 105262.22467783974

Iteration 9, inertia 105261.95299719454

Iteration 10, inertia 105261.8654178647

Converged at iteration 10: center shift 0.0 within tolerance 4.518704886

282502e-08

Initialization complete

Iteration 0, inertia 122711.0

Iteration 1, inertia 107016.92197927601

Iteration 2, inertia 106725.86288438976

Iteration 3, inertia 106389.85189450264

Iteration 4, inertia 105855.96266758068

Iteration 5, inertia 105618.32919026168

Iteration 6, inertia 105615.82459321404

Iteration 7, inertia 105614.67323278042

Iteration 8, inertia 105614.36725833177

Iteration 9, inertia 105614.04850063747

Iteration 10, inertia 105613.7236924288

Iteration 11, inertia 105613.04752775708

Iteration 12, inertia 105596.41606019471

Iteration 13, inertia 105575.48899535715

Iteration 14, inertia 105574.98147321874

Iteration 15, inertia 105574.6550451642

Iteration 16, inertia 105574.53426636991

Converged at iteration 16: center shift 0.0 within tolerance 4.518704886

282502e-08

Initialization complete

Iteration 0, inertia 123540.0

Iteration 1, inertia 107628.45993938661

Iteration 2, inertia 107418.37492083522

Iteration 3, inertia 107390.19362963722

Iteration 4, inertia 107386.40159430866

Iteration 5, inertia 107362.57324917441

Iteration 6, inertia 107148.48398408062

Iteration 7, inertia 107000.51037270026

Iteration 8, inertia 106998.35202941671

Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862

82502e-08

Initialization complete

Iteration 0, inertia 122237.0

Iteration 1, inertia 106198.66780334902

Iteration 2, inertia 105243.84249847301

Iteration 3, inertia 105150.01202994301

Iteration 4, inertia 105047.19239060339

Iteration 5, inertia 104908.452606533

Iteration 6, inertia 104901.25187748997

Iteration 7, inertia 104900.75036030597

Iteration 8, inertia 104900.67264348459
Iteration 9, inertia 104900.65895830544
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122594.0
Iteration 1, inertia 106406.50214167807
Iteration 2, inertia 105818.53140664946
Iteration 3, inertia 105791.52100933455
Iteration 4, inertia 105783.18134207057
Iteration 5, inertia 105776.54401091547
Iteration 6, inertia 105776.38460651311
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 135911.0
Iteration 1, inertia 105650.93520935216
Iteration 2, inertia 105189.34636073901
Iteration 3, inertia 105102.05971941775
Iteration 4, inertia 105014.2307511754
Iteration 5, inertia 105011.87482136778
Iteration 6, inertia 105011.75086170273
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 108922.0
Iteration 1, inertia 107497.89809855846
Iteration 2, inertia 106105.23630990156
Iteration 3, inertia 105863.52437042746
Iteration 4, inertia 105338.649766557
Iteration 5, inertia 105068.48040348648
Iteration 6, inertia 105054.57436025284
Iteration 7, inertia 105054.50896074998
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123681.0
Iteration 1, inertia 107220.03226882282
Iteration 2, inertia 106704.18274423329
Iteration 3, inertia 106562.87620192175
Iteration 4, inertia 106259.37073457844
Iteration 5, inertia 105930.68255193406
Iteration 6, inertia 105927.19479016215
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 121628.0
Iteration 1, inertia 106148.70139430623
Iteration 2, inertia 105856.34878002851
Iteration 3, inertia 105601.41399711832
Iteration 4, inertia 105552.60904155999
Iteration 5, inertia 105538.33178000904
Iteration 6, inertia 105518.2474406381
Iteration 7, inertia 105486.90934534295
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

82502e-08

Initialization complete

Iteration 0, inertia 123437.0

Iteration 1, inertia 107352.17560332664

Iteration 2, inertia 107284.6084861572

Iteration 3, inertia 106863.48013903042

Iteration 4, inertia 106800.79323445508

Iteration 5, inertia 106799.68741181705

Converged at iteration 5: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 135026.0

Iteration 1, inertia 105823.95747907055

Iteration 2, inertia 105434.46862338748

Iteration 3, inertia 105404.6900099092

Iteration 4, inertia 105040.96664456198

Iteration 5, inertia 104817.6804396867

Iteration 6, inertia 104763.35283987786

Iteration 7, inertia 104627.20083519655

Iteration 8, inertia 104625.82977181733

Iteration 9, inertia 104625.38266837256

Iteration 10, inertia 104625.10303782919

Iteration 11, inertia 104624.86261309848

Converged at iteration 11: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122617.0

Iteration 1, inertia 106904.30814059991

Iteration 2, inertia 106541.4278144948

Iteration 3, inertia 106032.06547266764

Iteration 4, inertia 105504.77706778205

Iteration 5, inertia 105279.42228970927

Iteration 6, inertia 105276.68159450767

Iteration 7, inertia 105276.06014010044

Iteration 8, inertia 105275.72062037986

Iteration 9, inertia 105275.30086262275

Iteration 10, inertia 105274.73674040352

Iteration 11, inertia 105265.88721273489

Iteration 12, inertia 105238.15627940874

Iteration 13, inertia 105236.85364038013

Iteration 14, inertia 105236.65059700535

Iteration 15, inertia 105236.58159211218

Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 123488.0

Iteration 1, inertia 107575.76342346579

Iteration 2, inertia 107365.67684655244

Iteration 3, inertia 107337.49569213486

Iteration 4, inertia 107333.70430240616

Iteration 5, inertia 107309.8799073264

Iteration 6, inertia 107095.78998282315

Iteration 7, inertia 106947.81017865818

Iteration 8, inertia 106945.65181141115

Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete
Iteration 0, inertia 122220.0
Iteration 1, inertia 106182.72517421003
Iteration 2, inertia 105227.89829779872
Iteration 3, inertia 105134.06843875378
Iteration 4, inertia 105031.24895879824
Iteration 5, inertia 104892.5085226044
Iteration 6, inertia 104885.30776449607
Iteration 7, inertia 104884.80626291686
Iteration 8, inertia 104884.72855784715
Iteration 9, inertia 104884.7148726486
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete
Iteration 0, inertia 122514.0
Iteration 1, inertia 106331.7850804482
Iteration 2, inertia 105743.80566873391
Iteration 3, inertia 105716.7943117591
Iteration 4, inertia 105708.45384876076
Iteration 5, inertia 105701.81648398351
Iteration 6, inertia 105701.65707958116
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete
Iteration 0, inertia 135873.0
Iteration 1, inertia 105617.04600487881
Iteration 2, inertia 105155.45447336581
Iteration 3, inertia 105068.16861673299
Iteration 4, inertia 104980.3393019882
Iteration 5, inertia 104977.98337218056
Iteration 6, inertia 104977.8594125155
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete
Iteration 0, inertia 108905.0
Iteration 1, inertia 107481.7284038726
Iteration 2, inertia 106089.53844157285
Iteration 3, inertia 105847.89082344383
Iteration 4, inertia 105323.02172509502
Iteration 5, inertia 105052.85199832152
Iteration 6, inertia 105038.9459550879
Iteration 7, inertia 105038.88055558503
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete
Iteration 0, inertia 123662.0
Iteration 1, inertia 107202.20755670831
Iteration 2, inertia 106686.3601325326
Iteration 3, inertia 106545.0520434457
Iteration 4, inertia 106241.54675814367
Iteration 5, inertia 105912.85628005993
Iteration 6, inertia 105909.36851738367
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete
Iteration 0, inertia 121599.0

Iteration 1, inertia 106120.73467034385
Iteration 2, inertia 105820.64002603354
Iteration 3, inertia 105535.04384940842
Iteration 4, inertia 105482.05378484563
Iteration 5, inertia 105458.00505309127
Iteration 6, inertia 105318.5644915781
Iteration 7, inertia 105184.1884634879
Iteration 8, inertia 105183.84899808698
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 123296.0
Iteration 1, inertia 107227.76545251576
Iteration 2, inertia 107163.3705486318
Iteration 3, inertia 106741.04504339235
Iteration 4, inertia 106655.86709272665
Iteration 5, inertia 106549.95630373212
Iteration 6, inertia 106468.1973895977
Iteration 7, inertia 106454.9832191282
Iteration 8, inertia 106442.14533071201
Iteration 9, inertia 106439.5752659838
Iteration 10, inertia 106439.53031048742
Converged at iteration 10: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 134789.0
Iteration 1, inertia 105611.4574060747
Iteration 2, inertia 105214.69483467244
Iteration 3, inertia 105187.98812307071
Iteration 4, inertia 104859.00057159229
Iteration 5, inertia 104619.05414651973
Iteration 6, inertia 104571.24195168723
Iteration 7, inertia 104433.71027807434
Iteration 8, inertia 104432.19087078937
Iteration 9, inertia 104431.77871494507
Iteration 10, inertia 104431.36801763282
Iteration 11, inertia 104431.31586874076
Iteration 12, inertia 104431.20706969337
Iteration 13, inertia 104431.1384477215
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122596.0
Iteration 1, inertia 106882.12511990816
Iteration 2, inertia 106519.3143852415
Iteration 3, inertia 106010.03957022764
Iteration 4, inertia 105482.34428219781
Iteration 5, inertia 105257.32638916779
Iteration 6, inertia 105254.57733474213
Iteration 7, inertia 105253.9558120521
Iteration 8, inertia 105253.61665163387
Iteration 9, inertia 105253.19473677622
Iteration 10, inertia 105252.63067948994
Iteration 11, inertia 105243.79047008332
Iteration 12, inertia 105216.07163801533
Iteration 13, inertia 105214.77601550050

Iteration 13, inertia 105214.77681330036
Iteration 14, inertia 105214.58170858286
Iteration 15, inertia 105214.51256520257
Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 123413.0
Iteration 1, inertia 107450.0383337386
Iteration 2, inertia 107239.95338601977
Iteration 3, inertia 107211.77239674743
Iteration 4, inertia 107207.9816784126
Iteration 5, inertia 107184.15962701135
Iteration 6, inertia 106970.07954965193
Iteration 7, inertia 106822.09754099931
Iteration 8, inertia 106819.93916333535
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122203.0
Iteration 1, inertia 106166.9418949951
Iteration 2, inertia 105212.11267044213
Iteration 3, inertia 105118.28272409999
Iteration 4, inertia 105014.99985470944
Iteration 5, inertia 104876.72539121295
Iteration 6, inertia 104869.52460367166
Iteration 7, inertia 104869.02313124803
Iteration 8, inertia 104868.94545148524
Iteration 9, inertia 104868.93176626602
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122449.0
Iteration 1, inertia 106451.02393992967
Iteration 2, inertia 105836.71623442855
Iteration 3, inertia 105657.09939032864
Iteration 4, inertia 105645.55805639668
Iteration 5, inertia 105636.07282676187
Iteration 6, inertia 105631.1376786619
Iteration 7, inertia 105628.90893467749
Iteration 8, inertia 105627.01661465307
Iteration 9, inertia 105625.67938684569
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122243.0
Iteration 1, inertia 106329.25520778887
Iteration 2, inertia 105289.63228687714
Iteration 3, inertia 105026.45953576507
Iteration 4, inertia 104970.36758391235
Iteration 5, inertia 104969.06575598737
Iteration 6, inertia 104967.4197162085
Iteration 7, inertia 104965.51440826058
Iteration 8, inertia 104923.7276186082
Iteration 9, inertia 104830.40302480594
Iteration 10, inertia 104828.38787419387
Iteration 11, inertia 104828.2480544762

Iteration 12, inertia 104828.16620435538
Iteration 13, inertia 104828.14976389176
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 108889.0
Iteration 1, inertia 107465.94344721895
Iteration 2, inertia 106073.80022526054
Iteration 3, inertia 105832.09202545408
Iteration 4, inertia 105307.49537825465
Iteration 5, inertia 105037.92003933432
Iteration 6, inertia 105024.01312028106
Iteration 7, inertia 105023.94769752419
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123642.0
Iteration 1, inertia 107168.08469167877
Iteration 2, inertia 106641.01177552479
Iteration 3, inertia 106488.6652388263
Iteration 4, inertia 106060.32205935255
Iteration 5, inertia 105681.05651553893
Iteration 6, inertia 105677.16363992004
Iteration 7, inertia 105677.01780124595
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 121523.0
Iteration 1, inertia 106049.99757536624
Iteration 2, inertia 105749.52350841823
Iteration 3, inertia 105463.44985498022
Iteration 4, inertia 105411.07668305357
Iteration 5, inertia 105388.08750929186
Iteration 6, inertia 105245.86932900363
Iteration 7, inertia 105118.65462122974
Iteration 8, inertia 105118.31303987093
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123252.0
Iteration 1, inertia 107168.19107635607
Iteration 2, inertia 107095.20033708117
Iteration 3, inertia 106669.503811446
Iteration 4, inertia 106582.46663803146
Iteration 5, inertia 106473.50917461413
Iteration 6, inertia 106391.06861870804
Iteration 7, inertia 106377.46850931113
Iteration 8, inertia 106364.62355872801
Iteration 9, inertia 106362.05338731148
Iteration 10, inertia 106362.0084318151
Converged at iteration 10: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 134664.0
Iteration 1, inertia 105455.0584286852
Iteration 2, inertia 105039.27785666261

Iteration 3, inertia 105011.94209929445
Iteration 4, inertia 104683.65891318276
Iteration 5, inertia 104444.02586668194
Iteration 6, inertia 104395.67341693137
Iteration 7, inertia 104258.1328613297
Iteration 8, inertia 104256.62651513774
Iteration 9, inertia 104256.19665802884
Iteration 10, inertia 104255.78498952612
Iteration 11, inertia 104255.60453859511
Iteration 12, inertia 104255.31484999614
Iteration 13, inertia 104255.12185996867
Iteration 14, inertia 104254.97067504043
Iteration 15, inertia 104254.91353496088
Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122502.0
Iteration 1, inertia 106768.11212844733
Iteration 2, inertia 106404.01159338419
Iteration 3, inertia 105894.73244395135
Iteration 4, inertia 105367.08739751503
Iteration 5, inertia 105142.05054875089
Iteration 6, inertia 105139.30184733498
Iteration 7, inertia 105138.68050897501
Iteration 8, inertia 105138.34181680322
Iteration 9, inertia 105137.9202886247
Iteration 10, inertia 105137.35690598263
Iteration 11, inertia 105128.51288033837
Iteration 12, inertia 105100.79438676934
Iteration 13, inertia 105099.57611458052
Iteration 14, inertia 105099.33074945015
Iteration 15, inertia 105099.24711343968
Iteration 16, inertia 105099.23653549892
Converged at iteration 16: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 123345.0
Iteration 1, inertia 107353.58373866728
Iteration 2, inertia 107125.9354547191
Iteration 3, inertia 107096.41604287257
Iteration 4, inertia 107092.62670104063
Iteration 5, inertia 107068.80669974252
Iteration 6, inertia 106854.74286393313
Iteration 7, inertia 106706.75363881377
Iteration 8, inertia 106704.59523006031
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 122139.0
Iteration 1, inertia 106130.88337829152
Iteration 2, inertia 105173.1472598885
Iteration 3, inertia 105076.51154972654
Iteration 4, inertia 104964.24780710718
Iteration 5, inertia 104837.23121261512
Iteration 6, inertia 104830.18938250732
Iteration 7, inertia 104829.11996901991

Iteration 7, inertia 104829.41990904991
Iteration 8, inertia 104829.28464248427
Iteration 9, inertia 104829.27095672164
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122437.0
Iteration 1, inertia 106440.2188285485
Iteration 2, inertia 105824.01432721743
Iteration 3, inertia 105646.0383678627
Iteration 4, inertia 105634.38824171179
Iteration 5, inertia 105624.07722620318
Iteration 6, inertia 105619.84898895782
Iteration 7, inertia 105617.64373366411
Iteration 8, inertia 105615.9713205878
Iteration 9, inertia 105614.87538192203
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122228.0
Iteration 1, inertia 106315.26893508824
Iteration 2, inertia 105275.6476073873
Iteration 3, inertia 105012.47446329994
Iteration 4, inertia 104956.38252116897
Iteration 5, inertia 104955.08076442678
Iteration 6, inertia 104953.43479499487
Iteration 7, inertia 104951.52959296397
Iteration 8, inertia 104909.74322027175
Iteration 9, inertia 104816.41844653118
Iteration 10, inertia 104814.40329584741
Iteration 11, inertia 104814.26347612975
Iteration 12, inertia 104814.18162600894
Iteration 13, inertia 104814.16518554532
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 108846.0
Iteration 1, inertia 107391.25885179166
Iteration 2, inertia 105987.52358360398
Iteration 3, inertia 105659.24304436753
Iteration 4, inertia 104953.49103222956
Iteration 5, inertia 104667.14620128403
Iteration 6, inertia 104653.00661992883
Iteration 7, inertia 104652.7514985386
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123621.0
Iteration 1, inertia 107140.6947158163
Iteration 2, inertia 106614.26261280177
Iteration 3, inertia 106462.16341893423
Iteration 4, inertia 106033.84098343286
Iteration 5, inertia 105654.56285555386
Iteration 6, inertia 105650.67023345164
Iteration 7, inertia 105650.52436320987
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862

82502e-08

Initialization complete

Iteration 0, inertia 121488.0

Iteration 1, inertia 106031.845319599

Iteration 2, inertia 105731.36530129188

Iteration 3, inertia 105445.22344812164

Iteration 4, inertia 105392.90889168846

Iteration 5, inertia 105369.91828191062

Iteration 6, inertia 105227.70211998883

Iteration 7, inertia 105100.4866400018

Iteration 8, inertia 105100.145058643

Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862

82502e-08

Initialization complete

Iteration 0, inertia 123210.0

Iteration 1, inertia 107128.40375492304

Iteration 2, inertia 107055.41827451298

Iteration 3, inertia 106629.72699792334

Iteration 4, inertia 106542.69022451519

Iteration 5, inertia 106433.7372302611

Iteration 6, inertia 106351.2955022237

Iteration 7, inertia 106337.69595711931

Iteration 8, inertia 106324.8501229363

Iteration 9, inertia 106322.2799432075

Iteration 10, inertia 106322.23498771113

Converged at iteration 10: center shift 0.0 within tolerance 4.518704886

282502e-08

Initialization complete

Iteration 0, inertia 133836.0

Iteration 1, inertia 105002.40863446605

Iteration 2, inertia 104590.76349973524

Iteration 3, inertia 104567.30155865855

Iteration 4, inertia 104280.5912686379

Iteration 5, inertia 104021.79712584392

Iteration 6, inertia 104013.06124944724

Iteration 7, inertia 103872.66533468617

Iteration 8, inertia 103838.97982163771

Iteration 9, inertia 103838.06289560955

Iteration 10, inertia 103837.55993747312

Iteration 11, inertia 103837.33996290139

Iteration 12, inertia 103837.12940789234

Converged at iteration 12: center shift 0.0 within tolerance 4.518704886

282502e-08

Initialization complete

Iteration 0, inertia 122483.0

Iteration 1, inertia 106750.1311633494

Iteration 2, inertia 106386.03495873703

Iteration 3, inertia 105876.75581131465

Iteration 4, inertia 105349.11841558172

Iteration 5, inertia 105124.07956158952

Iteration 6, inertia 105121.33089808602

Iteration 7, inertia 105120.70957938387

Iteration 8, inertia 105120.37093827121

Iteration 9, inertia 105119.94912715472

Iteration 10, inertia 105119.38581609097

Iteration 11, inertia 105110.54131171746

Iteration 12, inertia 105082.82288855039
Iteration 13, inertia 105081.60454482798
Iteration 14, inertia 105081.35917412306
Iteration 15, inertia 105081.27553581224
Iteration 16, inertia 105081.26495784479
Converged at iteration 16: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 123266.0
Iteration 1, inertia 107305.75192878698
Iteration 2, inertia 107078.05649119384
Iteration 3, inertia 107048.54063533715
Iteration 4, inertia 107044.74912737487
Iteration 5, inertia 107020.91611468265
Iteration 6, inertia 106807.961989181
Iteration 7, inertia 106661.6475247237
Iteration 8, inertia 106659.47640895449

Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 122089.0
Iteration 1, inertia 106083.27215940833
Iteration 2, inertia 105125.53148212284
Iteration 3, inertia 105028.8949048248
Iteration 4, inertia 104916.63301712259
Iteration 5, inertia 104789.61797329801
Iteration 6, inertia 104782.57617312757
Iteration 7, inertia 104781.80681387262
Iteration 8, inertia 104781.67153402652
Iteration 9, inertia 104781.65784822438

Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 121654.0
Iteration 1, inertia 105821.95788121656
Iteration 2, inertia 105167.9296823514
Iteration 3, inertia 104979.61251974382
Iteration 4, inertia 104927.55633870997
Iteration 5, inertia 104891.41577485578
Iteration 6, inertia 104885.45371604193
Iteration 7, inertia 104884.10643597532
Iteration 8, inertia 104882.77698401164
Iteration 9, inertia 104882.00761755092

Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 122210.0
Iteration 1, inertia 106298.35582647866
Iteration 2, inertia 105258.73268746326
Iteration 3, inertia 104995.55805054489
Iteration 4, inertia 104939.4661567753
Iteration 5, inertia 104938.16448859089
Iteration 6, inertia 104936.51861264154
Iteration 7, inertia 104934.61324941952
Iteration 8, inertia 104892.82649140919
Iteration 9, inertia 104799.50152145787

Iteration 9, inertia 104797.30192113707
Iteration 10, inertia 104797.48637070268
Iteration 11, inertia 104797.34655098502
Iteration 12, inertia 104797.2647008642
Iteration 13, inertia 104797.24826040059
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 108829.0
Iteration 1, inertia 107375.60506360399
Iteration 2, inertia 105971.87501932228
Iteration 3, inertia 105638.9868340916
Iteration 4, inertia 104937.81435344357
Iteration 5, inertia 104651.68096356612
Iteration 6, inertia 104650.96502843912
Iteration 7, inertia 104650.8544688289
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123501.0
Iteration 1, inertia 107031.06605935493
Iteration 2, inertia 106504.65037009402
Iteration 3, inertia 106352.56407461851
Iteration 4, inertia 105924.28576987243
Iteration 5, inertia 105544.98505429846
Iteration 6, inertia 105541.0924232355
Iteration 7, inertia 105540.94655299373
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 121459.0
Iteration 1, inertia 106004.09499404275
Iteration 2, inertia 105703.6149575309
Iteration 3, inertia 105417.47213837953
Iteration 4, inertia 105365.15756200108
Iteration 5, inertia 105342.16517250148
Iteration 6, inertia 105199.94980719067
Iteration 7, inertia 105072.73407135934
Iteration 8, inertia 105072.39249000054
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122809.0
Iteration 1, inertia 106741.29128252076
Iteration 2, inertia 106668.36537745698
Iteration 3, inertia 106254.02045210553
Iteration 4, inertia 106177.94709764025
Iteration 5, inertia 106133.8562725633
Iteration 6, inertia 105979.3534340683
Iteration 7, inertia 105958.6776087116
Iteration 8, inertia 105952.40339784416
Iteration 9, inertia 105952.33949165781
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 133784.0

Iteration 1, inertia 104958.66430474921
Iteration 2, inertia 104547.01557850107
Iteration 3, inertia 104523.55591725462
Iteration 4, inertia 104236.86207099083
Iteration 5, inertia 103978.06173847779
Iteration 6, inertia 103969.32474951254
Iteration 7, inertia 103828.93167246951
Iteration 8, inertia 103795.24552494919
Iteration 9, inertia 103794.32859892101
Iteration 10, inertia 103793.8256407846
Iteration 11, inertia 103793.60566621285
Iteration 12, inertia 103793.3951112038
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122470.0
Iteration 1, inertia 106738.19108398784
Iteration 2, inertia 106374.10019942743
Iteration 3, inertia 105864.82010474613
Iteration 4, inertia 105337.18691644997
Iteration 5, inertia 105112.14591071974
Iteration 6, inertia 105109.39730939487
Iteration 7, inertia 105108.77602554038
Iteration 8, inertia 105108.43745372168
Iteration 9, inertia 105108.01569994795
Iteration 10, inertia 105107.45251277304
Iteration 11, inertia 105098.60879293062
Iteration 12, inertia 105070.89063314069
Iteration 13, inertia 105069.6728585634
Iteration 14, inertia 105069.42747874868
Iteration 15, inertia 105069.343834862
Iteration 16, inertia 105069.33325686706
Converged at iteration 16: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 123250.0
Iteration 1, inertia 107290.90872164116
Iteration 2, inertia 107063.21237051321
Iteration 3, inertia 107033.69614854055
Iteration 4, inertia 107029.90447582032
Iteration 5, inertia 107006.07010770607
Iteration 6, inertia 106793.11822790763
Iteration 7, inertia 106646.80349938772
Iteration 8, inertia 106644.63237976554
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 122062.0
Iteration 1, inertia 106040.25917404641
Iteration 2, inertia 105075.49629901114
Iteration 3, inertia 104976.5414977648
Iteration 4, inertia 104865.60201358527
Iteration 5, inertia 104738.29181200716
Iteration 6, inertia 104731.23298750116
Iteration 7, inertia 104730.46308061838
Iteration 8, inertia 104730.32794068447

Iteration 9, inertia 104730.3142546892
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 121407.0
Iteration 1, inertia 105559.99697010955
Iteration 2, inertia 104920.51962276919
Iteration 3, inertia 104718.98379148741
Iteration 4, inertia 104660.20074366438
Iteration 5, inertia 104628.21423038811
Iteration 6, inertia 104625.09784518066
Iteration 7, inertia 104623.48392922318
Iteration 8, inertia 104622.66493409767
Iteration 9, inertia 104622.60836312892
Iteration 10, inertia 104622.52897786081
Iteration 11, inertia 104622.41290581539
Iteration 12, inertia 104622.36673685633
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 122170.0
Iteration 1, inertia 106246.94453548893
Iteration 2, inertia 105208.83795945118
Iteration 3, inertia 104945.63077012125
Iteration 4, inertia 104889.54560301288
Iteration 5, inertia 104888.244920689
Iteration 6, inertia 104886.59988588652
Iteration 7, inertia 104884.69456068781
Iteration 8, inertia 104842.9082253095
Iteration 9, inertia 104749.58079741093
Iteration 10, inertia 104747.56661926329
Iteration 11, inertia 104747.42735497984
Iteration 12, inertia 104747.34569193784
Iteration 13, inertia 104747.32924634295
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 108807.0
Iteration 1, inertia 107353.6837967286
Iteration 2, inertia 105949.95296255818
Iteration 3, inertia 105617.16930436039
Iteration 4, inertia 104916.80757606732
Iteration 5, inertia 104630.66488499155
Iteration 6, inertia 104629.9477848442
Iteration 7, inertia 104629.83716582238
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 123451.0
Iteration 1, inertia 106959.83814030106
Iteration 2, inertia 106433.4126954861
Iteration 3, inertia 106281.32562783068
Iteration 4, inertia 105853.05596304337
Iteration 5, inertia 105473.75079950734
Iteration 6, inertia 105469.8581666186
Iteration 7, inertia 105469.71229637682

Iteration 7, inertia 105105.71223037802
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 121445.0
Iteration 1, inertia 105991.14047230159
Iteration 2, inertia 105691.01128999988
Iteration 3, inertia 105405.33690631388
Iteration 4, inertia 105352.40333555947
Iteration 5, inertia 105329.2130454811
Iteration 6, inertia 105186.99828713459
Iteration 7, inertia 105059.78229291404
Iteration 8, inertia 105059.44071155523

Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 122763.0
Iteration 1, inertia 106697.42712137115
Iteration 2, inertia 106624.50678783715
Iteration 3, inertia 106210.16665949699
Iteration 4, inertia 106134.0934225645
Iteration 5, inertia 106090.00467103868
Iteration 6, inertia 105935.49942511144
Iteration 7, inertia 105914.82248327519
Iteration 8, inertia 105908.54825395133
Iteration 9, inertia 105908.48434776503

Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 133585.0
Iteration 1, inertia 104896.0005884685
Iteration 2, inertia 104482.8763375391
Iteration 3, inertia 104461.1651127713
Iteration 4, inertia 104185.13920603247
Iteration 5, inertia 103933.08956126093
Iteration 6, inertia 103931.71347794765
Iteration 7, inertia 103931.34627742626

Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 122431.0
Iteration 1, inertia 106649.89817311666
Iteration 2, inertia 106013.31812646776
Iteration 3, inertia 105495.62003318126
Iteration 4, inertia 105040.80629339298
Iteration 5, inertia 104751.37041342484
Iteration 6, inertia 104748.22056685638
Iteration 7, inertia 104747.60147184567
Iteration 8, inertia 104747.26349648635
Iteration 9, inertia 104746.84414558686
Iteration 10, inertia 104746.2883960789
Iteration 11, inertia 104738.26020524236
Iteration 12, inertia 104712.42424019917
Iteration 13, inertia 104711.56396722629
Iteration 14, inertia 104711.20614212978
Iteration 15, inertia 104711.1873010335

Converged at iteration 15: center shift 0.0 within tolerance 4.5187048862

Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 123174.0
Iteration 1, inertia 107186.91013336477
Iteration 2, inertia 106957.94576110746
Iteration 3, inertia 106927.43862445392
Iteration 4, inertia 106918.7383681761
Iteration 5, inertia 106886.0099758479
Iteration 6, inertia 106534.37601632881
Iteration 7, inertia 106329.4734071795
Iteration 8, inertia 106326.79465563761

Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 121890.0
Iteration 1, inertia 105852.88199803425
Iteration 2, inertia 104888.1001186073
Iteration 3, inertia 104789.1226183464
Iteration 4, inertia 104678.61381537157
Iteration 5, inertia 104550.76674785407
Iteration 6, inertia 104543.823858646
Iteration 7, inertia 104543.05330620565
Iteration 8, inertia 104542.91749806372
Iteration 9, inertia 104542.9038118865

Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 108709.0
Iteration 1, inertia 106256.38883532175
Iteration 2, inertia 104968.41177983709
Iteration 3, inertia 104634.45381920658
Iteration 4, inertia 104526.4926758667
Iteration 5, inertia 104302.07416401115
Iteration 6, inertia 104035.276495679
Iteration 7, inertia 103954.19380846624
Iteration 8, inertia 103929.44701585124
Iteration 9, inertia 103926.81638925719
Iteration 10, inertia 103924.40563577456
Iteration 11, inertia 103924.20226339677
Iteration 12, inertia 103924.17555114755
Iteration 13, inertia 103924.16456014375

Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122467.0
Iteration 1, inertia 106126.72993417848
Iteration 2, inertia 104991.95251945374
Iteration 3, inertia 104471.61480972992
Iteration 4, inertia 104093.30279067665
Iteration 5, inertia 103976.0269820236
Iteration 6, inertia 103938.0754001399
Iteration 7, inertia 103702.3167365054
Iteration 8, inertia 103693.70133455895
Iteration 9, inertia 103692.99145657271
Iteration 10, inertia 103692.66770728407

Iteration 11, inertia 103690.01681817685
Iteration 12, inertia 103687.7575972198
Iteration 13, inertia 103684.96816275244
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 123257.0
Iteration 1, inertia 107265.53786021493
Iteration 2, inertia 106280.18380926059
Iteration 3, inertia 105438.21157358067
Iteration 4, inertia 105115.56481561968
Iteration 5, inertia 104739.4993694654
Iteration 6, inertia 104734.74844915999
Iteration 7, inertia 104734.52687384607
Iteration 8, inertia 104734.49899287902
Iteration 9, inertia 104734.42352088583
Iteration 10, inertia 104734.26264956954
Iteration 11, inertia 104734.1338702877
Iteration 12, inertia 104734.06799361584
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 108506.0
Iteration 1, inertia 105969.46245754189
Iteration 2, inertia 104758.73756135507
Iteration 3, inertia 104375.13903949973
Iteration 4, inertia 103545.38815267423
Iteration 5, inertia 103478.57566358183
Iteration 6, inertia 103476.51096804022
Iteration 7, inertia 103475.57228228482
Iteration 8, inertia 103475.03535985277
Iteration 9, inertia 103474.9310119653
Iteration 10, inertia 103474.85192678006
Iteration 11, inertia 103474.7867022537
Iteration 12, inertia 103474.73931236747
Iteration 13, inertia 103474.64298976462
Iteration 14, inertia 103474.4700111215
Iteration 15, inertia 103474.43277555035
Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 122390.0
Iteration 1, inertia 106142.3837308698
Iteration 2, inertia 104858.42524373888
Iteration 3, inertia 104767.80348980984
Iteration 4, inertia 104754.9435628879
Iteration 5, inertia 104712.27943532793
Iteration 6, inertia 104655.36846889119
Iteration 7, inertia 104648.54732469711
Iteration 8, inertia 104648.019834868
Iteration 9, inertia 104647.49325712193
Iteration 10, inertia 104647.33014515085
Converged at iteration 10: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 122407.0

Iteration 0, inertia 106185.38338109778
Iteration 1, inertia 105551.8981093962
Iteration 2, inertia 105377.3697343817
Iteration 3, inertia 104972.19804677865
Iteration 4, inertia 104898.01484358014
Iteration 5, inertia 104879.4966909873
Iteration 6, inertia 104877.84658360272
Iteration 7, inertia 104877.71847297662
Iteration 8, inertia 104877.71847297662
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 108684.0
Iteration 1, inertia 107004.82537521944
Iteration 2, inertia 106631.78194433643
Iteration 3, inertia 105836.17271895558
Iteration 4, inertia 105529.11929763477
Iteration 5, inertia 105055.36571073432
Iteration 6, inertia 105025.50833724966
Iteration 7, inertia 105025.44749969886
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 121855.0
Iteration 1, inertia 105900.43800167473
Iteration 2, inertia 105151.98386445477
Iteration 3, inertia 104973.32369421783
Iteration 4, inertia 104520.43810614507
Iteration 5, inertia 104466.67024174638
Iteration 6, inertia 104465.7871917163
Iteration 7, inertia 104465.76406807831
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122182.0
Iteration 1, inertia 106385.64615949418
Iteration 2, inertia 105898.74495775586
Iteration 3, inertia 105327.96413373554
Iteration 4, inertia 105310.60169011742
Iteration 5, inertia 105228.40084899806
Iteration 6, inertia 105163.33734080987
Iteration 7, inertia 105080.68302147163
Iteration 8, inertia 104973.94529004906
Iteration 9, inertia 104968.71679720771
Iteration 10, inertia 104968.57737220911
Iteration 11, inertia 104968.56128739976
Converged at iteration 11: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 122527.0
Iteration 1, inertia 106471.99803517938
Iteration 2, inertia 105488.83449459859
Iteration 3, inertia 104174.67522762441
Iteration 4, inertia 104016.6345957774
Iteration 5, inertia 103993.36006890374
Iteration 6, inertia 103982.98359071073
Iteration 7, inertia 103981.4606115601

Iteration 7, inertia 103951.4626115621
Iteration 8, inertia 103939.19611089195
Iteration 9, inertia 103897.6843994821
Iteration 10, inertia 103765.85662651196
Iteration 11, inertia 103759.64488016903
Iteration 12, inertia 103759.54651411372
Iteration 13, inertia 103759.42957849585
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 108693.0
Iteration 1, inertia 106240.41458187312
Iteration 2, inertia 104942.66328556699
Iteration 3, inertia 104587.2223086688
Iteration 4, inertia 104479.25353858634
Iteration 5, inertia 104257.59492386607
Iteration 6, inertia 103988.99474404992
Iteration 7, inertia 103907.8486357044
Iteration 8, inertia 103883.10113129209
Iteration 9, inertia 103880.47031372726
Iteration 10, inertia 103878.05936063996
Iteration 11, inertia 103877.85596297821
Iteration 12, inertia 103877.82924205605
Iteration 13, inertia 103877.8182509043

Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122447.0
Iteration 1, inertia 106107.87465724499
Iteration 2, inertia 104973.09678577063
Iteration 3, inertia 104452.38285766022
Iteration 4, inertia 104075.41467420246
Iteration 5, inertia 103957.16743084342
Iteration 6, inertia 103919.21656511266
Iteration 7, inertia 103683.45816180704
Iteration 8, inertia 103674.84270222511
Iteration 9, inertia 103674.13281011768
Iteration 10, inertia 103673.80898751887
Iteration 11, inertia 103671.15819975389
Iteration 12, inertia 103668.8988644555
Iteration 13, inertia 103666.10942927178

Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 123238.0
Iteration 1, inertia 107247.59347863022
Iteration 2, inertia 106262.24326794747
Iteration 3, inertia 105420.27147696386
Iteration 4, inertia 105097.62570387516
Iteration 5, inertia 104721.55805465854
Iteration 6, inertia 104716.80713237083
Iteration 7, inertia 104716.58555705691
Iteration 8, inertia 104716.55767608985
Iteration 9, inertia 104716.48220409667
Iteration 10, inertia 104716.32133278037
Iteration 11, inertia 104716.19255349853

Iteration 12, inertia 104716.12667682668
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 108490.0
Iteration 1, inertia 105953.59763341393
Iteration 2, inertia 104742.8705748746
Iteration 3, inertia 104359.26971007574
Iteration 4, inertia 103529.51772761029
Iteration 5, inertia 103462.70433535076
Iteration 6, inertia 103460.63963944142
Iteration 7, inertia 103459.70095368598
Iteration 8, inertia 103459.16403125394
Iteration 9, inertia 103459.05968336647
Iteration 10, inertia 103458.98059818122
Iteration 11, inertia 103458.91537365488
Iteration 12, inertia 103458.86800493591
Iteration 13, inertia 103458.7715506675
Iteration 14, inertia 103458.59859483037
Iteration 15, inertia 103458.56135920562

Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122017.0
Iteration 1, inertia 105838.3849159694
Iteration 2, inertia 104566.71253220724
Iteration 3, inertia 104476.87076150844
Iteration 4, inertia 104465.05940383038
Iteration 5, inertia 104442.92571467443
Iteration 6, inertia 104374.5819903628
Iteration 7, inertia 104361.11534396982
Iteration 8, inertia 104360.42738503306
Iteration 9, inertia 104359.84259724907
Iteration 10, inertia 104359.57980541902
Iteration 11, inertia 104359.4166684983

Converged at iteration 11: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122392.0
Iteration 1, inertia 106171.47879857113
Iteration 2, inertia 105537.99523159955
Iteration 3, inertia 105363.46791745287
Iteration 4, inertia 104958.2954815913
Iteration 5, inertia 104884.1107064813
Iteration 6, inertia 104865.59243709822
Iteration 7, inertia 104863.94226864493
Iteration 8, inertia 104863.8141577552

Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 108624.0
Iteration 1, inertia 106945.19072049813
Iteration 2, inertia 106572.15458016173
Iteration 3, inertia 105776.55972684243
Iteration 4, inertia 105469.49974919902
Iteration 5, inertia 104995.7497001392

Iteration 6, inertia 104965.89036377054
Iteration 7, inertia 104965.82952621975
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 121448.0
Iteration 1, inertia 105560.06512744568
Iteration 2, inertia 104807.62681872584
Iteration 3, inertia 104627.93278879023
Iteration 4, inertia 104198.98485263235
Iteration 5, inertia 104148.21310414853
Iteration 6, inertia 104147.34510169011
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 122110.0
Iteration 1, inertia 106350.5018579813
Iteration 2, inertia 105771.49634552225
Iteration 3, inertia 105291.37231360098
Iteration 4, inertia 105276.02533632395
Iteration 5, inertia 105193.92261393882
Iteration 6, inertia 105128.87424613527
Iteration 7, inertia 105047.15724316056
Iteration 8, inertia 104941.21483607068
Iteration 9, inertia 104935.88657673757
Iteration 10, inertia 104935.64288712088
Iteration 11, inertia 104935.61942198368
Iteration 12, inertia 104935.6033353317
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 122330.0
Iteration 1, inertia 106282.10563979321
Iteration 2, inertia 105317.1048828533
Iteration 3, inertia 104034.74596884887
Iteration 4, inertia 103853.51253998262
Iteration 5, inertia 103829.76007862856
Iteration 6, inertia 103821.83725193518
Iteration 7, inertia 103807.79609415359
Iteration 8, inertia 103776.817778249
Iteration 9, inertia 103736.18061519603
Iteration 10, inertia 103608.5333245222
Iteration 11, inertia 103602.64537011764
Iteration 12, inertia 103602.4915084548
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 108603.0
Iteration 1, inertia 106120.40153321231
Iteration 2, inertia 104824.96230291654
Iteration 3, inertia 104467.22192901073
Iteration 4, inertia 104359.26167761783
Iteration 5, inertia 104137.62326146121
Iteration 6, inertia 103869.02861349014
Iteration 7, inertia 103787.88868287628
Iteration 8, inertia 103762.14100222610

Iteration 8, inertia 103765.14108232618
Iteration 9, inertia 103760.50971884515
Iteration 10, inertia 103758.10001329893
Iteration 11, inertia 103757.89653680014
Iteration 12, inertia 103757.86975765393
Iteration 13, inertia 103757.85876632849
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122414.0
Iteration 1, inertia 106066.42260867865
Iteration 2, inertia 104931.65297003035
Iteration 3, inertia 104410.93614140166
Iteration 4, inertia 104033.96815047467
Iteration 5, inertia 103915.7188963956
Iteration 6, inertia 103877.77291642188
Iteration 7, inertia 103642.01209722926
Iteration 8, inertia 103633.39648088178
Iteration 9, inertia 103632.6865640816
Iteration 10, inertia 103632.36264530104
Iteration 11, inertia 103629.71311806151
Iteration 12, inertia 103627.45491549947
Iteration 13, inertia 103624.66547752162

Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 123127.0
Iteration 1, inertia 106866.05028141041
Iteration 2, inertia 105599.22119658354
Iteration 3, inertia 104830.52024195946
Iteration 4, inertia 104493.1832604317
Iteration 5, inertia 104094.59644851992
Iteration 6, inertia 104085.93742558244
Iteration 7, inertia 104085.7102154409

Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 108408.0
Iteration 1, inertia 105866.55704528034
Iteration 2, inertia 104655.83622570518
Iteration 3, inertia 104272.24814879622
Iteration 4, inertia 103442.49704996395
Iteration 5, inertia 103375.68181611685
Iteration 6, inertia 103373.61711943774
Iteration 7, inertia 103372.67843368232
Iteration 8, inertia 103372.14151125027
Iteration 9, inertia 103372.0371633628
Iteration 10, inertia 103371.95807817756
Iteration 11, inertia 103371.8928536512
Iteration 12, inertia 103371.84547715499
Iteration 13, inertia 103371.74904252446
Iteration 14, inertia 103371.57610733515
Iteration 15, inertia 103371.5388716031

Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 121895.0
Iteration 1, inertia 105708.1919974743
Iteration 2, inertia 104447.56823754108
Iteration 3, inertia 104359.62533226066
Iteration 4, inertia 104347.63771335503
Iteration 5, inertia 104327.20041370901
Iteration 6, inertia 104258.69029975678
Iteration 7, inertia 104245.00901378116
Iteration 8, inertia 104244.41669927468
Iteration 9, inertia 104243.74897426627
Iteration 10, inertia 104243.48651718885
Iteration 11, inertia 104243.3233704884
Converged at iteration 11: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122370.0
Iteration 1, inertia 106151.57412722392
Iteration 2, inertia 105518.0901148368
Iteration 3, inertia 105343.56768384053
Iteration 4, inertia 104938.39316212645
Iteration 5, inertia 104864.20968444398
Iteration 6, inertia 104845.69124249942
Iteration 7, inertia 104844.04098090129
Iteration 8, inertia 104843.91286946966
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 108595.0
Iteration 1, inertia 106916.4700370012
Iteration 2, inertia 106543.4234154782
Iteration 3, inertia 105747.82354535461
Iteration 4, inertia 105440.89358305903
Iteration 5, inertia 104968.00086388607
Iteration 6, inertia 104938.11275308082
Iteration 7, inertia 104938.05184257244
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 121403.0
Iteration 1, inertia 105518.45768916067
Iteration 2, inertia 104766.01441945008
Iteration 3, inertia 104586.3230376272
Iteration 4, inertia 104157.37310751958
Iteration 5, inertia 104106.59945006174
Iteration 6, inertia 104105.73144760332
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 108259.0
Iteration 1, inertia 106338.7008007003
Iteration 2, inertia 105760.61049645704
Iteration 3, inertia 105281.45958111782
Iteration 4, inertia 105266.11310607234
Iteration 5, inertia 105184.01573408087
Iteration 6, inertia 105118.97492538895
Iteration 7, inertia 105037.27829712864

Iteration 8, inertia 104931.32965205048
Iteration 9, inertia 104926.00060817528
Iteration 10, inertia 104925.75709255277
Iteration 11, inertia 104925.73394673227
Iteration 12, inertia 104925.71785977602
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122058.0
Iteration 1, inertia 106124.69215920797
Iteration 2, inertia 105173.27549399604
Iteration 3, inertia 103935.15688128478
Iteration 4, inertia 103709.67312312358
Iteration 5, inertia 103683.87138067756
Iteration 6, inertia 103675.8257196152
Iteration 7, inertia 103665.51158286289
Iteration 8, inertia 103631.88775054007
Iteration 9, inertia 103599.50876279043
Iteration 10, inertia 103469.1627434323
Iteration 11, inertia 103461.65631335186
Iteration 12, inertia 103461.4194423652

Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 108487.0
Iteration 1, inertia 105929.59837103206
Iteration 2, inertia 104603.85643671382
Iteration 3, inertia 104244.04581769019
Iteration 4, inertia 104132.83930130453
Iteration 5, inertia 103911.92796458879
Iteration 6, inertia 103643.77161426618
Iteration 7, inertia 103562.63032865038
Iteration 8, inertia 103537.79654331194
Iteration 9, inertia 103535.14889180151
Iteration 10, inertia 103532.73888587575
Iteration 11, inertia 103532.53565355962
Iteration 12, inertia 103532.50882640247
Iteration 13, inertia 103532.49783460342

Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 121572.0
Iteration 1, inertia 105440.72796830222
Iteration 2, inertia 104815.5179856301
Iteration 3, inertia 104382.39194178705
Iteration 4, inertia 103982.71913504912
Iteration 5, inertia 103842.41516219606
Iteration 6, inertia 103802.98266356907
Iteration 7, inertia 103566.0601687122
Iteration 8, inertia 103558.89461305573
Iteration 9, inertia 103558.54840267598
Iteration 10, inertia 103558.3106386899
Iteration 11, inertia 103556.47646349609
Iteration 12, inertia 103554.03562710754
Iteration 13, inertia 103551.84422115846
Iteration 14, inertia 103550.72202525506

Iteration 14, inertia 103550.75205555500
Converged at iteration 14: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 122647.0
Iteration 1, inertia 106440.31955417761
Iteration 2, inertia 105171.75909291914
Iteration 3, inertia 104433.70652826538
Iteration 4, inertia 104103.44908373836
Iteration 5, inertia 103731.67534342929
Iteration 6, inertia 103724.65457229759
Iteration 7, inertia 103724.17020955363
Iteration 8, inertia 103723.77232480973
Iteration 9, inertia 103722.60597274487
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 108384.0
Iteration 1, inertia 105824.39238651453
Iteration 2, inertia 104587.8750731181
Iteration 3, inertia 104125.83802962453
Iteration 4, inertia 103305.41026583135
Iteration 5, inertia 103239.44301382818
Iteration 6, inertia 103237.72678119091
Iteration 7, inertia 103237.16040610471
Iteration 8, inertia 103236.83587500402
Iteration 9, inertia 103236.6991126295
Iteration 10, inertia 103236.61831622626
Iteration 11, inertia 103236.57485774468
Converged at iteration 11: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 121708.0
Iteration 1, inertia 105534.74283037717
Iteration 2, inertia 104273.2780888316
Iteration 3, inertia 104186.08980495422
Iteration 4, inertia 104173.85553216252
Iteration 5, inertia 104146.64690829028
Iteration 6, inertia 104090.92256093067
Iteration 7, inertia 104083.2697060979
Iteration 8, inertia 104082.71792201238
Iteration 9, inertia 104082.13376872019
Iteration 10, inertia 104081.81408299356
Iteration 11, inertia 104081.62859766852
Iteration 12, inertia 104081.59723469435
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 122351.0
Iteration 1, inertia 106133.67460932907
Iteration 2, inertia 105500.18911352886
Iteration 3, inertia 105325.66551365466
Iteration 4, inertia 104920.49047591878
Iteration 5, inertia 104846.3082337039
Iteration 6, inertia 104827.78968946259
Iteration 7, inertia 104826.13936592455

Iteration 8, inertia 104826.01125422808
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 108561.0
Iteration 1, inertia 106901.46608669366
Iteration 2, inertia 106533.42549625624
Iteration 3, inertia 105737.82673856404
Iteration 4, inertia 105430.89946915234
Iteration 5, inertia 104958.00703401353
Iteration 6, inertia 104928.11841574006
Iteration 7, inertia 104928.05750523169

Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 121365.0
Iteration 1, inertia 105482.89923098397
Iteration 2, inertia 104730.45058693839
Iteration 3, inertia 104550.76167771268
Iteration 4, inertia 104121.81690634871
Iteration 5, inertia 104071.04213902022
Iteration 6, inertia 104070.1741365618

Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 108145.0
Iteration 1, inertia 106230.04395833524
Iteration 2, inertia 105652.65017436622
Iteration 3, inertia 105173.24735570943
Iteration 4, inertia 105159.61874425504
Iteration 5, inertia 105079.19537380985
Iteration 6, inertia 105010.95474999482
Iteration 7, inertia 104929.05419907895
Iteration 8, inertia 104823.1826330878
Iteration 9, inertia 104818.10824542573
Iteration 10, inertia 104817.84541912502
Iteration 11, inertia 104817.42410493593
Iteration 12, inertia 104817.07340239492

Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 121727.0
Iteration 1, inertia 105814.90846799106
Iteration 2, inertia 104886.3107263133
Iteration 3, inertia 103715.21153357974
Iteration 4, inertia 103477.06135926502
Iteration 5, inertia 103451.35535153095
Iteration 6, inertia 103443.68927575507
Iteration 7, inertia 103438.55671481992
Iteration 8, inertia 103429.54332087711
Iteration 9, inertia 103385.6701974996
Iteration 10, inertia 103242.60565837854
Iteration 11, inertia 103231.18287809397
Iteration 12, inertia 103225.55769187195
Iteration 13, inertia 103218.91047522365
Iteration 14, inertia 103218.8214252159

Converged at iteration 14: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 108377.0
Iteration 1, inertia 105820.08893838573
Iteration 2, inertia 104494.56438037627
Iteration 3, inertia 104134.70000805172
Iteration 4, inertia 104023.33446295475
Iteration 5, inertia 103802.44669778776
Iteration 6, inertia 103534.2952622754
Iteration 7, inertia 103453.15196830647
Iteration 8, inertia 103428.31657694076
Iteration 9, inertia 103425.66847237787
Iteration 10, inertia 103423.257952258
Iteration 11, inertia 103423.05464655615
Iteration 12, inertia 103423.02777906854
Iteration 13, inertia 103423.01678697343

Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 121542.0
Iteration 1, inertia 105412.72728336559
Iteration 2, inertia 104787.52052203337
Iteration 3, inertia 104354.39602335049
Iteration 4, inertia 103954.72693749944
Iteration 5, inertia 103814.42189644213
Iteration 6, inertia 103774.98969779779
Iteration 7, inertia 103538.06675662713
Iteration 8, inertia 103530.90112030569
Iteration 9, inertia 103530.55491157738
Iteration 10, inertia 103530.3171661126
Iteration 11, inertia 103528.4829785713
Iteration 12, inertia 103526.04209136452
Iteration 13, inertia 103523.85096525069
Iteration 14, inertia 103522.7387787863

Converged at iteration 14: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122627.0
Iteration 1, inertia 106410.52917784073
Iteration 2, inertia 105140.74399801185
Iteration 3, inertia 104392.08011759308
Iteration 4, inertia 104077.47687100254
Iteration 5, inertia 103671.57450743554
Iteration 6, inertia 103492.60432700884
Iteration 7, inertia 103445.51799109689
Iteration 8, inertia 103444.02589373836
Iteration 9, inertia 103443.29721856788
Iteration 10, inertia 103443.02359537482
Iteration 11, inertia 103441.80123392236

Converged at iteration 11: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 108324.0
Iteration 1, inertia 105765.5851232257
Iteration 2, inertia 104532.17333206385

Iteration 2, inertia 104352.1733290383
Iteration 3, inertia 104067.92712493573
Iteration 4, inertia 103243.61647455461
Iteration 5, inertia 103186.01366440702
Iteration 6, inertia 103184.30336859162
Iteration 7, inertia 103183.77621179086
Iteration 8, inertia 103183.4421410584
Iteration 9, inertia 103183.30089003788
Iteration 10, inertia 103183.15423884583
Iteration 11, inertia 103183.11063945296
Converged at iteration 11: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 121648.0
Iteration 1, inertia 105422.86539684409
Iteration 2, inertia 104159.68514151033
Iteration 3, inertia 104071.68362987756
Iteration 4, inertia 104059.7370524001
Iteration 5, inertia 104033.60158615262
Iteration 6, inertia 103981.06460203628
Iteration 7, inertia 103973.90794812591
Iteration 8, inertia 103972.7642041077
Iteration 9, inertia 103972.14963980473
Iteration 10, inertia 103971.91613233925
Iteration 11, inertia 103971.73633155397
Iteration 12, inertia 103971.70496821476

Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122333.0
Iteration 1, inertia 106122.3953726248
Iteration 2, inertia 105485.9354892941
Iteration 3, inertia 105311.1423590677
Iteration 4, inertia 104905.90045248931
Iteration 5, inertia 104831.77886065794
Iteration 6, inertia 104813.26031641665
Iteration 7, inertia 104811.60999287861
Iteration 8, inertia 104811.48188118212

Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 108546.0
Iteration 1, inertia 106886.52951459035
Iteration 2, inertia 106518.4963477671
Iteration 3, inertia 105722.89905319521
Iteration 4, inertia 105415.97284642284
Iteration 5, inertia 104943.08183698477
Iteration 6, inertia 104913.19273814757
Iteration 7, inertia 104913.13182763921

Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 121350.0
Iteration 1, inertia 105469.24283504084
Iteration 2, inertia 104716.74652299786
Iteration 3, inertia 104537.05833454207

Iteration 4, inertia 104108.10943779038
Iteration 5, inertia 104057.33460103047
Iteration 6, inertia 104056.46659857206
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 108057.0
Iteration 1, inertia 106131.90147085716
Iteration 2, inertia 105553.27369068652
Iteration 3, inertia 105075.12672699531
Iteration 4, inertia 105061.50435632527
Iteration 5, inertia 104981.0898002514
Iteration 6, inertia 104912.8578356166
Iteration 7, inertia 104830.97152683446
Iteration 8, inertia 104725.10069960362
Iteration 9, inertia 104720.02706260611
Iteration 10, inertia 104719.76416733983
Iteration 11, inertia 104719.34271583207
Iteration 12, inertia 104718.99201289307
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 121671.0
Iteration 1, inertia 105745.73268696292
Iteration 2, inertia 104826.6427796044
Iteration 3, inertia 103671.2904957675
Iteration 4, inertia 103414.80198032643
Iteration 5, inertia 103388.66179078813
Iteration 6, inertia 103380.92210936407
Iteration 7, inertia 103375.75007548067
Iteration 8, inertia 103366.73812755631
Iteration 9, inertia 103322.85961232238
Iteration 10, inertia 103180.1449383132
Iteration 11, inertia 103168.37370983919
Iteration 12, inertia 103162.74784027033
Iteration 13, inertia 103156.1005063266
Iteration 14, inertia 103156.01145587534
Converged at iteration 14: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 108293.0
Iteration 1, inertia 105735.47576632563
Iteration 2, inertia 104409.99811356927
Iteration 3, inertia 104050.10200055667
Iteration 4, inertia 103938.75535781549
Iteration 5, inertia 103717.90211202698
Iteration 6, inertia 103449.74985758722
Iteration 7, inertia 103368.60704338133
Iteration 8, inertia 103343.7697636016
Iteration 9, inertia 103341.12110499699
Iteration 10, inertia 103338.71017060231
Iteration 11, inertia 103338.50684368257
Iteration 12, inertia 103338.4800248312
Iteration 13, inertia 103338.46903210256
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete
Iteration 0, inertia 121525.0
Iteration 1, inertia 105396.9597491092
Iteration 2, inertia 104771.70769923723
Iteration 3, inertia 104338.52131895225
Iteration 4, inertia 103938.84880660707
Iteration 5, inertia 103798.62343217754
Iteration 6, inertia 103759.1405859303
Iteration 7, inertia 103522.07890739756
Iteration 8, inertia 103514.63885064171
Iteration 9, inertia 103513.96608361727
Iteration 10, inertia 103513.35913238623
Iteration 11, inertia 103511.50404762242
Iteration 12, inertia 103509.03253500414
Iteration 13, inertia 103506.78048677203
Iteration 14, inertia 103505.44679026121
Iteration 15, inertia 103505.26427452556
Iteration 16, inertia 103505.0059070783
Iteration 17, inertia 103504.90395050714
Iteration 18, inertia 103504.87583029848
Converged at iteration 18: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete
Iteration 0, inertia 122547.0
Iteration 1, inertia 106335.76964062276
Iteration 2, inertia 105065.98437169884
Iteration 3, inertia 104317.31882673633
Iteration 4, inertia 104002.72658368241
Iteration 5, inertia 103596.81306834995
Iteration 6, inertia 103417.84507279305
Iteration 7, inertia 103370.75732542893
Iteration 8, inertia 103369.26522747245
Iteration 9, inertia 103368.536552302
Iteration 10, inertia 103368.26292910894
Iteration 11, inertia 103367.04056765648
Converged at iteration 11: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete
Iteration 0, inertia 108304.0
Iteration 1, inertia 105748.14322696591
Iteration 2, inertia 104516.95273510407
Iteration 3, inertia 104053.42002683411
Iteration 4, inertia 103229.37099296019
Iteration 5, inertia 103169.42139914808
Iteration 6, inertia 103167.81825923406
Iteration 7, inertia 103167.48375618427
Iteration 8, inertia 103167.24469660915
Iteration 9, inertia 103166.94752685894
Iteration 10, inertia 103166.77964709251
Iteration 11, inertia 103166.69143248741
Iteration 12, inertia 103166.61307693772
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete
Iteration 0, inertia 121549.0
Iteration 1, inertia 105332.9940353704

Iteration 1, inertia 103932.5510333704
Iteration 2, inertia 104069.81699598677
Iteration 3, inertia 103981.81021932584
Iteration 4, inertia 103969.88174775428
Iteration 5, inertia 103943.48440846057
Iteration 6, inertia 103891.14102861981
Iteration 7, inertia 103884.0396108173
Iteration 8, inertia 103882.8959391329
Iteration 9, inertia 103882.28142588162
Iteration 10, inertia 103882.04807093389
Iteration 11, inertia 103881.86805644633
Iteration 12, inertia 103881.83669247122
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122316.0
Iteration 1, inertia 106106.40845956304
Iteration 2, inertia 105469.94918414958
Iteration 3, inertia 105295.15863210296
Iteration 4, inertia 104889.91549584415
Iteration 5, inertia 104815.79451989921
Iteration 6, inertia 104797.27590242657
Iteration 7, inertia 104795.62554288721
Iteration 8, inertia 104795.4974309165
Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 108516.0
Iteration 1, inertia 106826.29155907557
Iteration 2, inertia 106436.89552510642
Iteration 3, inertia 105496.21807736132
Iteration 4, inertia 105178.87447013539
Iteration 5, inertia 104711.75334744123
Iteration 6, inertia 104686.34473900785
Iteration 7, inertia 104686.27899903078
Iteration 8, inertia 104686.26276314283
Iteration 9, inertia 104686.23161349345
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 121239.0
Iteration 1, inertia 105378.61780836021
Iteration 2, inertia 104626.10400318292
Iteration 3, inertia 104446.46338397995
Iteration 4, inertia 104017.94515786179
Iteration 5, inertia 103966.74494549636
Iteration 6, inertia 103965.87694303796
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 108029.0
Iteration 1, inertia 106100.24232808895
Iteration 2, inertia 105487.7195056962
Iteration 3, inertia 105005.43583833592
Iteration 4, inertia 104991.81978004897
Iteration 5, inertia 104911.40716418526

Iteration 6, inertia 104843.18112633997
Iteration 7, inertia 104761.29498408691
Iteration 8, inertia 104655.42484662044
Iteration 9, inertia 104650.35255014514
Iteration 10, inertia 104650.08956414231
Iteration 11, inertia 104649.66793207184
Iteration 12, inertia 104649.31722874052
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 121638.0
Iteration 1, inertia 105710.09652313337
Iteration 2, inertia 104792.52490156848
Iteration 3, inertia 103636.5523588138
Iteration 4, inertia 103380.14996289813
Iteration 5, inertia 103354.12464384057
Iteration 6, inertia 103346.18551097366
Iteration 7, inertia 103340.98869802745
Iteration 8, inertia 103331.93601954092
Iteration 9, inertia 103288.45548946959
Iteration 10, inertia 103145.35190668957
Iteration 11, inertia 103133.6480444283
Iteration 12, inertia 103127.95362574427
Iteration 13, inertia 103121.3065127934
Iteration 14, inertia 103121.21746211818
Converged at iteration 14: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 108278.0
Iteration 1, inertia 105654.76326121105
Iteration 2, inertia 104290.70451092864
Iteration 3, inertia 103932.84573338558
Iteration 4, inertia 103821.66526329564
Iteration 5, inertia 103600.68083149892
Iteration 6, inertia 103332.54312290164
Iteration 7, inertia 103251.77763014773
Iteration 8, inertia 103226.57044300933
Iteration 9, inertia 103223.8731745073
Iteration 10, inertia 103221.46155422273
Iteration 11, inertia 103221.25806605084
Iteration 12, inertia 103221.23096570684
Iteration 13, inertia 103221.21997252204
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 121225.0
Iteration 1, inertia 105094.57296642946
Iteration 2, inertia 104506.01617279588
Iteration 3, inertia 104086.3451562141
Iteration 4, inertia 103754.92788192486
Iteration 5, inertia 103561.28273705716
Iteration 6, inertia 103492.87218096634
Iteration 7, inertia 103213.01136275158
Iteration 8, inertia 103205.2414829868
Iteration 9, inertia 103204.38971572559
Iteration 10, inertia 103203.53029093104

Iteration 11, inertia 103203.37448267212
Iteration 12, inertia 103203.35465668252
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 122487.0
Iteration 1, inertia 106223.94656667544
Iteration 2, inertia 104951.71185138014
Iteration 3, inertia 104203.057336633
Iteration 4, inertia 103888.51079628209
Iteration 5, inertia 103482.5840536846
Iteration 6, inertia 103303.62335598325
Iteration 7, inertia 103256.5346736292
Iteration 8, inertia 103255.0430496451
Iteration 9, inertia 103254.34867450617
Iteration 10, inertia 103254.06822427218
Iteration 11, inertia 103252.84364920776
Converged at iteration 11: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 108288.0
Iteration 1, inertia 105732.3255122569
Iteration 2, inertia 104501.11889606468
Iteration 3, inertia 104037.57526741012
Iteration 4, inertia 103214.44769007768
Iteration 5, inertia 103154.49782157644
Iteration 6, inertia 103152.89437776367
Iteration 7, inertia 103152.5628435426
Iteration 8, inertia 103152.32273560375
Iteration 9, inertia 103152.02463605502
Iteration 10, inertia 103151.85822354526
Iteration 11, inertia 103151.81180662908
Iteration 12, inertia 103151.69466937272
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 121528.0
Iteration 1, inertia 105313.2093732773
Iteration 2, inertia 104050.03026820612
Iteration 3, inertia 103962.0227478578
Iteration 4, inertia 103950.0946822066
Iteration 5, inertia 103923.69882290001
Iteration 6, inertia 103871.35534992123
Iteration 7, inertia 103864.25395592334
Iteration 8, inertia 103863.11030872329
Iteration 9, inertia 103862.4957682919
Iteration 10, inertia 103862.26243030948
Iteration 11, inertia 103862.08237563212
Iteration 12, inertia 103862.05101158872
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 122294.0
Iteration 1, inertia 106073.99149833735
Iteration 2, inertia 105431.42384467192
Iteration 3, inertia 105181.4776524908

Iteration 3, inertia 104646.15767739456
Iteration 4, inertia 104738.83590513412
Iteration 5, inertia 104671.23010612921
Iteration 6, inertia 104648.02953947397
Iteration 7, inertia 104646.28541470309
Iteration 8, inertia 104646.16879841889
Iteration 9, inertia 104646.15767739456
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 108384.0
Iteration 1, inertia 106604.16965454917
Iteration 2, inertia 106212.97703765878
Iteration 3, inertia 105269.92161514197
Iteration 4, inertia 104952.84228644923
Iteration 5, inertia 104485.71786234264
Iteration 6, inertia 104460.3016077711
Iteration 7, inertia 104460.23586779402
Iteration 8, inertia 104460.21963190609
Iteration 9, inertia 104460.1884822567
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 121223.0
Iteration 1, inertia 105363.75578417699
Iteration 2, inertia 104611.23683796161
Iteration 3, inertia 104431.59487541203
Iteration 4, inertia 104003.0767049966
Iteration 5, inertia 103951.87586761657
Iteration 6, inertia 103951.00786515816
Converged at iteration 6: center shift 0.0 within tolerance 4.5187048862
82502e-08

Initialization complete

Iteration 0, inertia 107839.0
Iteration 1, inertia 105910.40744547905
Iteration 2, inertia 105297.94833864698
Iteration 3, inertia 104815.64954287179
Iteration 4, inertia 104802.0379466662
Iteration 5, inertia 104721.63803532874
Iteration 6, inertia 104653.42114937515
Iteration 7, inertia 104571.55675389238
Iteration 8, inertia 104465.68313926843
Iteration 9, inertia 104460.61311268814
Iteration 10, inertia 104460.35011360003
Iteration 11, inertia 104459.92845679287
Iteration 12, inertia 104459.57775286083
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 121609.0
Iteration 1, inertia 105630.9533290296
Iteration 2, inertia 104602.73355587256
Iteration 3, inertia 103488.69587935573
Iteration 4, inertia 103235.48870231833
Iteration 5, inertia 103186.6163242432
Iteration 6, inertia 103167.34932586964

Iteration 7, inertia 103162.15054842609
Iteration 8, inertia 103159.45551353123
Iteration 9, inertia 103150.71642964483
Iteration 10, inertia 103010.34770114931
Iteration 11, inertia 102954.81727754763
Iteration 12, inertia 102950.80149544637
Iteration 13, inertia 102950.30477595178
Iteration 14, inertia 102950.10004966785
Iteration 15, inertia 102950.0693618339
Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 108254.0
Iteration 1, inertia 105628.23828060077
Iteration 2, inertia 104265.14354070472
Iteration 3, inertia 103907.34195702126
Iteration 4, inertia 103796.29875218836
Iteration 5, inertia 103574.60219185338
Iteration 6, inertia 103307.17767005353
Iteration 7, inertia 103226.43426917016
Iteration 8, inertia 103201.28237839609
Iteration 9, inertia 103198.65021730286
Iteration 10, inertia 103196.23829239175
Iteration 11, inertia 103196.03478703716
Iteration 12, inertia 103196.00767288246
Iteration 13, inertia 103195.99667966875
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 121203.0
Iteration 1, inertia 105073.71615921843
Iteration 2, inertia 104488.5825516692
Iteration 3, inertia 104072.01170985618
Iteration 4, inertia 103732.44644780643
Iteration 5, inertia 103540.32476754021
Iteration 6, inertia 103480.1266283444
Iteration 7, inertia 103195.89748510328
Iteration 8, inertia 103184.51433375453
Iteration 9, inertia 103183.6325732845
Iteration 10, inertia 103183.08419255911
Iteration 11, inertia 103182.63166257825
Iteration 12, inertia 103182.52911806096
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122445.0
Iteration 1, inertia 106185.27341994476
Iteration 2, inertia 104913.03972310832
Iteration 3, inertia 104164.38720447785
Iteration 4, inertia 103849.84812954935
Iteration 5, inertia 103443.91647745894
Iteration 6, inertia 103264.95271016295
Iteration 7, inertia 103217.86309353024
Iteration 8, inertia 103216.37146918933
Iteration 9, inertia 103215.67709405039
Iteration 10, inertia 103215.39664381642

Iteration 11, inertia 103214.17206875197
Converged at iteration 11: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 108253.0
Iteration 1, inertia 105702.45262675075
Iteration 2, inertia 104471.2403446973
Iteration 3, inertia 104007.69691103295
Iteration 4, inertia 103184.58291264741
Iteration 5, inertia 103124.6431674904
Iteration 6, inertia 103123.03701540695
Iteration 7, inertia 103122.72724293859
Iteration 8, inertia 103122.48694917047
Iteration 9, inertia 103122.18884962174
Iteration 10, inertia 103122.02243711201
Iteration 11, inertia 103121.9760201958
Iteration 12, inertia 103121.85888293947
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 121429.0
Iteration 1, inertia 105224.49186465103
Iteration 2, inertia 103960.51669550852
Iteration 3, inertia 103873.30034730022
Iteration 4, inertia 103861.3712508539
Iteration 5, inertia 103834.08298386366
Iteration 6, inertia 103782.64296994857
Iteration 7, inertia 103775.5416339107
Iteration 8, inertia 103774.39815440036
Iteration 9, inertia 103773.78347475104
Iteration 10, inertia 103773.5488080883
Iteration 11, inertia 103773.36844432831
Iteration 12, inertia 103773.3370796549
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 122276.0
Iteration 1, inertia 106057.18490679307
Iteration 2, inertia 105414.60968009147
Iteration 3, inertia 105164.60147582412
Iteration 4, inertia 104722.90146605497
Iteration 5, inertia 104655.33663026744
Iteration 6, inertia 104632.13606361221
Iteration 7, inertia 104630.39193884132
Iteration 8, inertia 104630.27532255709
Iteration 9, inertia 104630.2642015328
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 108364.0
Iteration 1, inertia 106584.06371954211
Iteration 2, inertia 106192.89563804436
Iteration 3, inertia 105249.85311990097
Iteration 4, inertia 104932.77957558614
Iteration 5, inertia 104465.65378169379
Iteration 6, inertia 104440.23571161555

Iteration 6, inertia 104440.16997163848
Iteration 7, inertia 104440.15373575053
Iteration 8, inertia 104440.12258610113
Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 121011.0
Iteration 1, inertia 105144.41261654884
Iteration 2, inertia 104405.68233279177
Iteration 3, inertia 104228.5546428955
Iteration 4, inertia 103807.09527301314
Iteration 5, inertia 103757.63473941889
Iteration 6, inertia 103756.85973301576
Iteration 7, inertia 103756.83575392923
Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862
82502e-08
Initialization complete
Iteration 0, inertia 107812.0
Iteration 1, inertia 105883.41028264331
Iteration 2, inertia 105270.95577766023
Iteration 3, inertia 104788.65530809936
Iteration 4, inertia 104775.0435562313
Iteration 5, inertia 104694.64415728117
Iteration 6, inertia 104626.4274649935
Iteration 7, inertia 104544.56247986775
Iteration 8, inertia 104438.68846678632
Iteration 9, inertia 104433.61834533453
Iteration 10, inertia 104433.3553467213
Iteration 11, inertia 104432.9336908404
Iteration 12, inertia 104432.58298684929
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 120965.0
Iteration 1, inertia 105317.11898062374
Iteration 2, inertia 104326.6923291105
Iteration 3, inertia 103286.47320323643
Iteration 4, inertia 102992.4330607705
Iteration 5, inertia 102944.56486874365
Iteration 6, inertia 102926.27406472145
Iteration 7, inertia 102921.09563159295
Iteration 8, inertia 102918.57986318303
Iteration 9, inertia 102911.34404696863
Iteration 10, inertia 102794.510483977
Iteration 11, inertia 102743.34120226277
Iteration 12, inertia 102738.88141282638
Iteration 13, inertia 102738.52994356959
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 108238.0
Iteration 1, inertia 105612.23840216229
Iteration 2, inertia 104249.14544411447
Iteration 3, inertia 103891.34240459577
Iteration 4, inertia 103780.30018290842
Iteration 5, inertia 103758.60507000000

Iteration 5, inertia 103558.60507026962
Iteration 6, inertia 103291.18049996681
Iteration 7, inertia 103210.43618234816
Iteration 8, inertia 103185.28417547024
Iteration 9, inertia 103182.65198352448
Iteration 10, inertia 103180.24002864119
Iteration 11, inertia 103180.03652024323
Iteration 12, inertia 103180.00940636708
Iteration 13, inertia 103179.99841312348
Converged at iteration 13: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 121145.0
Iteration 1, inertia 105006.41087840959
Iteration 2, inertia 104353.35782963154
Iteration 3, inertia 103750.18736232098
Iteration 4, inertia 103504.93292355162
Iteration 5, inertia 103211.68208073713
Iteration 6, inertia 103127.86208650967
Iteration 7, inertia 102927.29438510584
Iteration 8, inertia 102896.97752383849
Iteration 9, inertia 102896.1786097768
Iteration 10, inertia 102895.70725091857
Iteration 11, inertia 102895.33222168485
Iteration 12, inertia 102895.18582731746
Iteration 13, inertia 102895.00524763881
Iteration 14, inertia 102894.54945189183
Iteration 15, inertia 102894.52904520335

Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 122383.0
Iteration 1, inertia 106124.413962428
Iteration 2, inertia 104852.1874240223
Iteration 3, inertia 104103.53314158566
Iteration 4, inertia 103789.00476594729
Iteration 5, inertia 103383.0678306262
Iteration 6, inertia 103204.10585910431
Iteration 7, inertia 103157.01540015085
Iteration 8, inertia 103155.52377545123
Iteration 9, inertia 103154.82940031232
Iteration 10, inertia 103154.54895007833
Iteration 11, inertia 103153.3243750139

Converged at iteration 11: center shift 0.0 within tolerance 4.518704886
282502e-08

Initialization complete

Iteration 0, inertia 108172.0
Iteration 1, inertia 105500.12308475775
Iteration 2, inertia 104252.27914836275
Iteration 3, inertia 103793.3805511525
Iteration 4, inertia 102959.07590333544
Iteration 5, inertia 102898.72934080898
Iteration 6, inertia 102896.99470354097
Iteration 7, inertia 102896.77594779464
Iteration 8, inertia 102896.67957557467

Converged at iteration 8: center shift 0.0 within tolerance 4.5187048862

82502e-08

Initialization complete

Iteration 0, inertia 121127.0

Iteration 1, inertia 104912.19072673561

Iteration 2, inertia 103684.895326529

Iteration 3, inertia 103597.11729027319

Iteration 4, inertia 103587.398369065

Iteration 5, inertia 103561.22334563971

Iteration 6, inertia 103515.65287612227

Iteration 7, inertia 103509.5483230265

Iteration 8, inertia 103508.99428505634

Iteration 9, inertia 103508.62361617154

Iteration 10, inertia 103504.49408980316

Iteration 11, inertia 103503.6818949889

Iteration 12, inertia 103503.0147176532

Iteration 13, inertia 103502.83565874989

Iteration 14, inertia 103502.67815161023

Converged at iteration 14: center shift 0.0 within tolerance 4.518704886

282502e-08

Initialization complete

Iteration 0, inertia 122252.0

Iteration 1, inertia 106008.91887887428

Iteration 2, inertia 105202.59564325187

Iteration 3, inertia 104907.23227766556

Iteration 4, inertia 104476.32128907541

Iteration 5, inertia 104409.54902081592

Iteration 6, inertia 104387.65244734293

Iteration 7, inertia 104387.31757918725

Iteration 8, inertia 104385.9006297409

Iteration 9, inertia 104385.85455602658

Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862

82502e-08

Initialization complete

Iteration 0, inertia 108333.0

Iteration 1, inertia 106553.12655127383

Iteration 2, inertia 106161.96389220405

Iteration 3, inertia 105218.92462496931

Iteration 4, inertia 104901.85305077599

Iteration 5, inertia 104434.72654514802

Iteration 6, inertia 104409.30801286061

Iteration 7, inertia 104409.24227288352

Iteration 8, inertia 104409.22603699559

Iteration 9, inertia 104409.1948873462

Converged at iteration 9: center shift 0.0 within tolerance 4.5187048862

82502e-08

Initialization complete

Iteration 0, inertia 120877.0

Iteration 1, inertia 104953.06020568528

Iteration 2, inertia 104186.6644290455

Iteration 3, inertia 104008.82037249161

Iteration 4, inertia 103587.26383482401

Iteration 5, inertia 103537.7753390195

Iteration 6, inertia 103536.97368774607

Iteration 7, inertia 103536.95205902409

Converged at iteration 7: center shift 0.0 within tolerance 4.5187048862

82502e-08


```

Initialization complete
Iteration 0, inertia 107800.0
Iteration 1, inertia 105826.67767983081
Iteration 2, inertia 105196.97627728764
Iteration 3, inertia 104714.67418621306
Iteration 4, inertia 104701.06223224977
Iteration 5, inertia 104620.66233406372
Iteration 6, inertia 104552.44668139855
Iteration 7, inertia 104470.58265453899
Iteration 8, inertia 104364.70827015114
Iteration 9, inertia 104359.63805026385
Iteration 10, inertia 104359.37505093841
Iteration 11, inertia 104358.95339362095
Iteration 12, inertia 104358.60268956803
Converged at iteration 12: center shift 0.0 within tolerance 4.518704886
282502e-08
Initialization complete
Iteration 0, inertia 120904.0
Iteration 1, inertia 105215.57677511591
Iteration 2, inertia 103885.85197365913
Iteration 3, inertia 103058.29600785303
Iteration 4, inertia 102632.12174838605
Iteration 5, inertia 102592.26173598284
Iteration 6, inertia 102584.6695504755
Iteration 7, inertia 102561.85975037096
Iteration 8, inertia 102558.88079153649
Iteration 9, inertia 102555.7367416609
Iteration 10, inertia 102553.91005576766
Iteration 11, inertia 102548.71684004244
Iteration 12, inertia 102456.11386586679
Iteration 13, inertia 102394.43479368858
Iteration 14, inertia 102389.85732875046
Iteration 15, inertia 102389.52254102417
Converged at iteration 15: center shift 0.0 within tolerance 4.518704886
282502e-08

```

Pour chaque itération un score a été affiché

La méthode Elbow est une technique très populaire et l'idée est d'effectuer le k-means clustering pour un nombre de clusters k et pour chaque valeur, nous calculons la somme des carrés des distances de chaque point à son centre assigné (distorsions). Lorsque les distorsions sont tracées et que le graphique ressemble à un bras, le "elbow" (le point d'inflexion de la courbe) est la meilleure valeur de k.

In [58]:

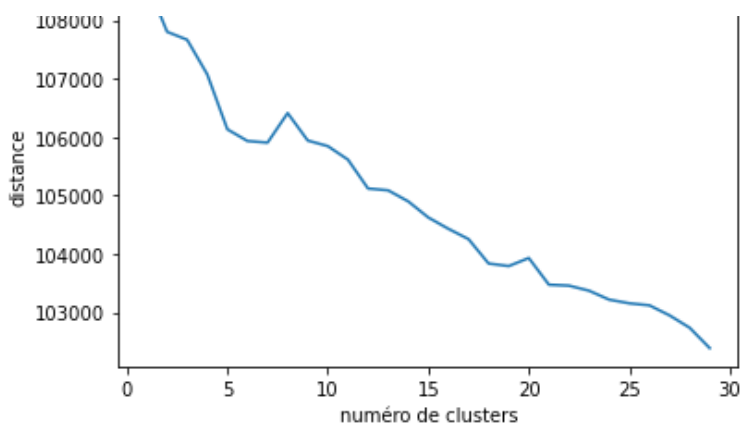
```

import matplotlib.pyplot as plt
plt.xlabel('numéro de clusters')
plt.ylabel('distance')
plt.plot(range(1,30),dist)
plt.title('methode elbow')
plt.show()

```

methode elbow





In [59]:

```
true_k=30
Kmeans=KMeans(n_clusters=true_k,init='k-means++',n_init=1)
Kmeans.fit(matrix)
```

Out[59]:

```
KMeans(n_clusters=30, n_init=1)
```

maintenant on va afficher les mots racine essentiels pour chaque cluster comme un résumé de chaque groupement

In [60]:

```
print("les mots essentielles du thème ")
centroids = Kmeans.cluster_centers_.argsort()[:, :-1]
mot = vectorizer.get_feature_names()
for i in range(true_k):
    print("dans Cluster %d:" % i)
    for ind in centroids[i, :10]:
        print(' %s' % mot[ind])
    print()
```

les mots essentielles du thème

dans Cluster 0:

thank
god
it
much
the
go
get
everyon
realli
thi

dans Cluster 1:

good
custom
sell
let
my
tyyyyyme
want

know
cars
still

dans Cluster 2:

it
the
like
get
go
thi
that
need
we
want

dans Cluster 3:

play
backer
we
spi
deep
quarterback
hole
mike
smith
put

dans Cluster 4:

man
similar
cylind
ugli
look
collapse
roof
either
team
like

dans Cluster 5:

peopl
like
it
don
the
need
help
if
get
know

dans Cluster 6:

think
pay

mind
let
sit
needi
tweet
done
fav
faux

dans Cluster 7:

love
would
you
it
good
much
help
realli
check
see

dans Cluster 8:

one
it
day
no
thing
like
time
we
the
that

dans Cluster 9:

got
it
one
like
you
the
all
still
get
see

dans Cluster 10:

wrong
am
what
it
and
fuck
ye
when
the
isnt

dans Cluster 11:

matter
mind
sixti
feel
say
eightb
nineb
don
faux
fault

dans Cluster 12:

claim
london
centr
labour
lie
the
told
was
polic
fixat

dans Cluster 13:

reveal
cnp
alec
newli
elect
question
state
record
gop
work

dans Cluster 14:

realest
seen
done
post
aye
faux
father
fatherinsidestrategi
fatigu
fault

dans Cluster 15:

make
moment
want
hear
everi
inevit

older
spread
love
grow

dans Cluster 16:

think
it
you
time
like
get
reveng
that
one
go

dans Cluster 17:

nightmare
12
aesthet
child
name
pronoun
call
want
mi
non

dans Cluster 18:

cool
engineers
teethgarlean
give
garlean
question
quick
giant
built
robotpilot

dans Cluster 19:

doesnt
sure
lot
thi
look
harm
like
threaten
violenc
physic

dans Cluster 20:

million
survive

surpass
view
youtube
698
less
left
dynamite
70
mv

dans Cluster 21:

000
given
spend
americans
pentagon
the
care
provid
can
afford

dans Cluster 22:

chri
excori
senat
hear
2020
proven
election
wrong
fra
total

dans Cluster 23:

covid
19
vaccin
week
next
bidens
get
expect
receiv
new

dans Cluster 24:

you
thank
we
back
tweet
retweet
way
know
choos

quot

dans Cluster 25:

500
within
next
total
hours
retweet
enter
each
give
to

dans Cluster 26:

back
retweet
button
the
old
is
it
normal
wait
rt

dans Cluster 27:

pro
bowl
votes
doubl
day
last
voting
vote
double
get

dans Cluster 28:

porn
wifi
look
hand
better
forward
restrictio
on
go
one

dans Cluster 29:

she
it
her
get
the

back
one
like
that
go

Après avoir récupéré les classes, on a choisi un Tweet par classe comme représentant. Les Tweets choisis seront les résumés de toutes les informations contenues dans les Tweets.

In [61]:

```
final_twitter_data= pd.DataFrame(columns = [ 'text'])
i=0
j=0
while i<30:
    while True:
        lastData=vectorizer.transform([stem_data[j]])
        prediction=Kmeans.predict(lastData)
        if i == prediction:
            print("representant du cluster "+str(prediction)+twitter_data.loc[j,"text"])
            final_twitter_data.loc[i,"text"] =twitter_data.loc[j,"text"]
        j=0
        break
    j+=1
    i+=1
final_twitter_data.to_csv('final_twitter_dataFrame.csv',index = False )
```

representant du cluster [0] THANK GOD
representant du cluster [1] I wanted to let you know .. I'm still selling cars.. My customers having a good tyyyyyyme!
representant du cluster [2] Build a team So strongYou don't know who the boss is
representant du cluster [3]We putting P smith at mike backer play the deep hole spy the Quarterback
representant du cluster [4]An ugly win. Man, this team can either fire on all cylinders or look like the roof is gonna collapse... similar to...
representant du cluster [5] ...people in Louisville have told me they are terrified. Now that media has died down and the leaders of the people have...
representant du cluster [6] Pay no mind to this needy tweet. Let it sit here and think about what it's done.
representant du cluster [7] Falling in love can act as a painkiller
representant du cluster [8] "I would say it was one of our best performances of the season, personally."The skipper reacts to a relentless performance from...
representant du cluster [9] no I still got the nasty one
representant du cluster [10] Wrong
representant du cluster [11]sixty nineBe who you are and say what you feel, because those who mind don't matter, and those who matter don't m...
representant du cluster [12] A Labour politician lied to police claiming The Fixated Threat Assessment Centre in London had told him I was...
representant du cluster [13] "Newly Surfaced Recording Reveals ALEC and GOP Election Attorneys (and the CNP) Working with State Legislators to O

FOR Election Attorneys [and the CNF] WORKING WITH State Legislators to question...

representant du cluster [14] Aye this the realest post I done seen !

representant du cluster [15] we hear you and love you so much. growing older is inevitable .. and we want to spread the message of MAKING EVERY MOMENT...

representant du cluster [16] not really what i was going for there at all, i think bioware only gets the benefit of the doubt when t...

representant du cluster [17] you named your child x æ a-12 and you want to call PRONOUNS an aesthetic nightmare????

representant du cluster [18] Garlean engineers: we built a giant robotPilot: cool cool quick question why did you give it teethGarlean engineers:...

representant du cluster [19] This sure looks a lot like threatening violence and physical harm doesnt it

representant du cluster [20] "Dynamite" MV (has now surpassed 698 million views on YouTube, less than 2 million views left until it surpasses 70...

representant du cluster [21] Beyoncé Giselle Knowles My Purse Stay Open Carter has given \$10,000 grants to 600 small businesses totaling \$6,000,000.NON...

representant du cluster [22] Chris Krebs was totally excoriated and proven wrong at the Senate Hearing on the Fraudulent 2020 Election. Massive FRA...

representant du cluster [23] President-elect is expected to get the COVID-19 vaccine as soon as next week, a transition official confirms to...

representant du cluster [24]You can get a 'Used' copy of 'Miss, What Does Incomprehensible Mean?' at for £7.49 & free delivery...

representant du cluster [25] We'll give \$2,500 total to 5 people (\$500 each) who retweet this within the next 72 hours. To enter: - Follow

representant du cluster [26] Didn't take long at all. We are back to the nonsense shit. But anything illegal would be blurb t...

representant du cluster [27] s = DOUBLE the Pro Bowl Votes! +

representant du cluster [28]On the one hand I'm looking forward to going back to uni because I'll have much better WiFi (and no porn restrictio...

representant du cluster [29] It was extremely parenting. She'd have ripped out our lungs and beaten us to death with them.

Conclusion

on a effectué quelques étapes essentielles du prétraitement du texte : tokenisation, suppression des stop-words, lemmatisation et stemming. puis on a fait la classification des données et crée de notre ensemble de features des représentatives tout cela va permettre à faciliter la lecture des tweets en donnant un recapitulant ce qui permettra donner une visibilité sur l'actualité et peut être participer à la prise des décision dans plusieurs cas

In [65]:

```
%watermark --iversions
```

```
tweepy      : 3.9.0
pandas      : 1.0.5
nltk        : 3.5
matplotlib: 3.2.2
re          : 2.2.1
```

In []: