Marcellus Hope

Kaneshiro Hope

[illegible] Indigenous Dance [illegible]

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Introduction

- Pre-natal management knowledge on [illegible].
- Pre-natal care's [illegible] of [illegible].
- Training [illegible] of [illegible]-[illegible] [illegible] [illegible].
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55. Independent Modules

```
import numpy as np
import matplotlib.pyplot as plt
from sklearn.datasets import make_blobs

X, y = make_blobs(n_samples=300, centers=4, random_state=0, cluster_std=0.60)

plt.scatter(X[:, 0], X[:, 1], s=50, c='b')
plt.title('Scatter plot')
plt.xlabel('Feature 1')
plt.ylabel('Feature 2')
plt.show()

import numpy as np
from sklearn.cluster import KMeans
from sklearn.preprocessing import StandardScaler
from sklearn.decomposition import PCA
from sklearn.metrics import silhouette_score

X = np.array([[1, 2], [5, 8], [1.5, 1.8], [8, 8], [1, 0.6], [9, 11]])

kmeans = KMeans(n_clusters=2, random_state=0).fit(X)
print("Cluster centers:", kmeans.cluster_centers_)
print("Labels:", kmeans.labels_)
print("Predicted labels for [0, 0]:", kmeans.predict([[0, 0]]))
print("Predicted labels for [12, 3]:", kmeans.predict([[12, 3]]))

import numpy as np
from sklearn.cluster import KMeans
from sklearn.preprocessing import StandardScaler
from sklearn.decomposition import PCA
from sklearn.metrics import silhouette_score

X = np.array([[1, 2], [5, 8], [1.5, 1.8], [8, 8], [1, 0.6], [9, 11]])

scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

kmeans = KMeans(n_clusters=2, random_state=0).fit(X_scaled)
print("Cluster centers:", kmeans.cluster_centers_)
print("Labels:", kmeans.labels_)
print("Predicted labels for [0, 0]:", kmeans.predict([[0, 0]]))
print("Predicted labels for [12, 3]:", kmeans.predict([[12, 3]]))

import numpy as np
from sklearn.cluster import KMeans
from sklearn.preprocessing import StandardScaler
from sklearn.decomposition import PCA
from sklearn.metrics import silhouette_score

X = np.array([[1, 2], [5, 8], [1.5, 1.8], [8, 8], [1, 0.6], [9, 11]])

scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

pca = PCA(n_components=2)
X_pca = pca.fit_transform(X_scaled)

kmeans = KMeans(n_clusters=2, random_state=0).fit(X_pca)
print("Cluster centers:", kmeans.cluster_centers_)
print("Labels:", kmeans.labels_)
print("Predicted labels for [0, 0]:", kmeans.predict([[0, 0]]))
print("Predicted labels for [12, 3]:", kmeans.predict([[12, 3]]))

import numpy as np
from sklearn.cluster import KMeans
from sklearn.preprocessing import StandardScaler
from sklearn.decomposition import PCA
from sklearn.metrics import silhouette_score

X = np.array([[1, 2], [5, 8], [1.5, 1.8], [8, 8], [1, 0.6], [9, 11]])

scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

pca = PCA(n_components=2)
X_pca = pca.fit_transform(X_scaled)

kmeans = KMeans(n_clusters=2, random_state=0).fit(X_pca)
silhouette_avg = silhouette_score(X_pca, kmeans.labels_)
print("The average silhouette score is:", silhouette_avg)
```

Conclusion

Wat we meenemen

- Een goede voorbereiding bespaart veel ellende.
- Communicatie is minstens zo belangrijk als techniek.
- Documentatie voorkomt dat iedereen dezelfde vragen blijft stellen.

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Blog Operations

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Biography Operations

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Medical Ethics

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Bullets

- Normal bullet paragraph after a paragraph
- A second bullet paragraph for balance
- A third bullet paragraph for wrapping
- Bullet with longer text
- Bullet with short

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Tuple unpacking in for loops

```
# Iterating over a list of tuples
for name, age in people:
    print(f"{name} is {age} years old")

# Output:
# Alice is 30 years old
# Bob is 25 years old
# Carol is 35 years old

# Dictionary items() returns key-value tuples
for key, value in config.items():
    print(f"{key} = {value}")

# Output:
# host = localhost
# port = 8080
# debug = True

# Nested tuple unpacking
for (x, y), (z, w) in points:
    print(x, y, z, w)

# Output:
# 1 2 3 4
# 5 6 7 8

# Ignoring values with _
for _, name, _ in records:
    print(name)

# Output:
# Alice
# Bob
# Carol

# Enumerate returns (index, value) tuples
for i, (name, age) in enumerate(people, start=1):
    print(f"{i}. {name}, {age}")

# Output:
# 1. Alice, 30
# 2. Bob, 25
# 3. Carol, 35

# Zip combines two lists into tuple pairs
for name, score in zip(students, grades):
    print(f"{name}: {score}")

# Output:
# Alice: 95
# Bob: 87
# Carol: 92
```

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Based on the Sample Data

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Ecosystem Partnerships and Integrations

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Energy Conservation Principle

Energy cannot be created or destroyed, only transformed from one form to another.

Kinetic Energy

$$E_k = \frac{1}{2}mv^2$$

Potential Energy

$$E_p = mgh$$

Total Energy

$$E_{total} = E_k + E_p$$

Conservation Law

$$E_{total} = \text{constant}$$

Example

Ball dropped from 10 m:

- At top: $E_p = mgh$, $E_k = 0$
- At bottom: $E_p = 0$, $E_k = mgh$
- Total: $E_{total} = mgh$

Pendulum

- At rest: $E_p = mgh$, $E_k = 0$
- Swinging: $E_p = mgh - \frac{1}{2}mv^2$, $E_k = \frac{1}{2}mv^2$
- Total: $E_{total} = mgh$

Spring

$$E_p = \frac{1}{2}kx^2$$

Example

Spring compressed 0.5 m, $k = 200$ N/m:

- $E_p = \frac{1}{2} \times 200 \times 0.5^2 = 25$ J
- $E_k = 0$
- $E_{total} = 25$ J

Conservation

$$E_{total} = \text{constant}$$

Example

Ball dropped from 10 m:

- At top: $E_p = mgh$, $E_k = 0$
- At bottom: $E_p = 0$, $E_k = mgh$
- Total: $E_{total} = mgh$

Pendulum

- At rest: $E_p = mgh$, $E_k = 0$
- Swinging: $E_p = mgh - \frac{1}{2}mv^2$, $E_k = \frac{1}{2}mv^2$
- Total: $E_{total} = mgh$

Spring

$$E_p = \frac{1}{2}kx^2$$

Example

Spring compressed 0.5 m, $k = 200$ N/m:

- $E_p = \frac{1}{2} \times 200 \times 0.5^2 = 25$ J
- $E_k = 0$
- $E_{total} = 25$ J

Conservation

$$E_{total} = \text{constant}$$

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Numerical computation

Lagrange interpolation — one point per data set:

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L_0(x) = (x − x_1)/(x_0 − x_1) · (x − x_2)/(x_0 − x_2) · (x − x_3)/(x_0 − x_3)
L_1(x) = (x − x_0)/(x_1 − x_0) · (x − x_2)/(x_1 − x_2)
L_2(x) = (x − x_0)/(x_2 − x_0) · (x − x_1)
L_3(x) = (x − x_0)/(x_3 − x_0)

L_0(x) = (x − x_1)/(x_0 − x_1)
L_1(x) = (x − x_0)/(x_1 − x_0)
L_2(x) = (x − x_0)/(x_2 − x_0) · (x − x_1)/(x_2 − x_1)
L_3(x) = (x − x_0)/(x_3 − x_0) · (x − x_1)/(x_3 − x_1) · (x − x_2)/(x_3 − x_2)
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Acknowledgements

We thank the Bonn International Graduate School.

- Thanks to the participants of several international workshops.
- Thanks to the [illegible] and anonymous referees, especially [illegible].
- Thanks to the [illegible] and [illegible] for [illegible], [illegible].

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Bibliography [illegible]

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