6th ICTROPS

The 6th INTERNATIONAL CONFERENCE FOR TROPICAL STUDIES AND ITS APPLICATIONS

Toward Sustainable Tropical Environment for New Capital City of Indonesia

ABSTRACT BOOK

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CLOUD COMPUTING MODELLING BASED ON THE INTERSECTION OF CIRCLES AND DBSCAN FOR CHARACTERIZING DENSITY OF THE CITY

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ABSTRACT

The density of a city is very influential on to the environmental health of the city community. The character of a city needs to be developed and identified so that the advance coordination can be developed optimally. A city that will be built requires an information network pattern as a framework for the density center of the city environment. While a city that already exists, requires identification on to the density character as an effort to maintain the environmental health. The objective of this research was to provide a cloud computing model for a city in a computer network to control the density of the city environment. The intersection of circles and DBSCAN were used as the basis for modeling. The center of urban neighborhood density was marked as spatial data, where the coordinates were the center of the clusters. The urban environmental development plan was used as a labeling reference. Then, the computational design was interpreted, which waa the main result of the research. The main conclusion of this research was a method to control the density of the city environment based on cloud computing.

Key words: city, cloud, computing, density, model.

CLOUD COMPUTING MODELLING BASED ON THE INTERSECTION OF CIRCLES AND DBSCAN FOR CHARACTERIZING DENSITY OF THE CITY



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CLOUD COMPUTING MODELLING BASED ON THE INTERSECTION OF CIRCLES AND DBSCAN FOR CHARACTERIZING DENSITY OF THE CITY

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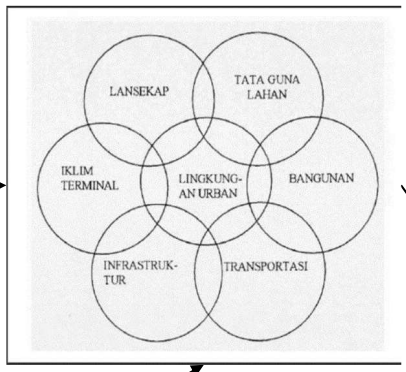
Why is this title ?

Indonesia is building a new capital city !. One aspect that deserves attention regarding the development of a city is environmental health, namely the ecological balance between humans and the environment in order to ensure the healthy condition of the city dwellers. The city's environmental health describes the ideal of urban environmental density.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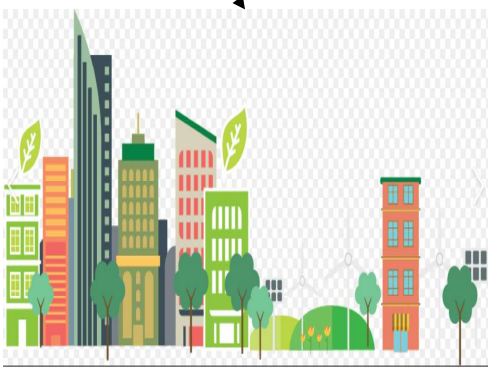

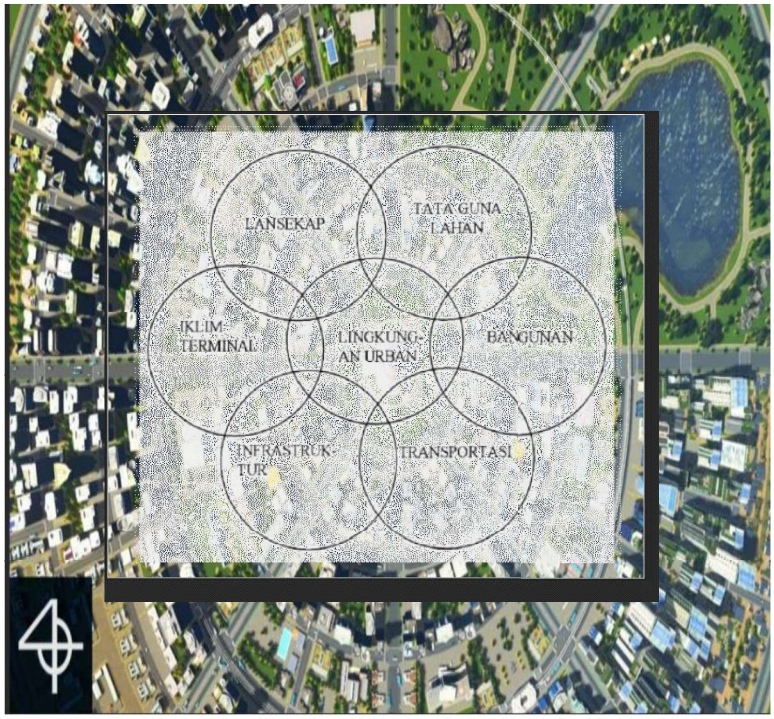
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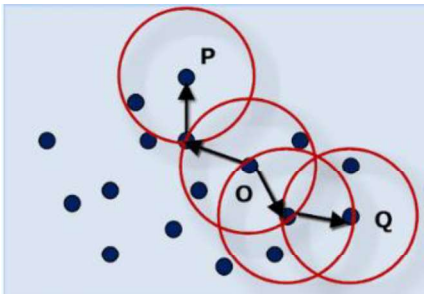

P
O
Q

Tools :

Client Infrastructure : CFEngine

Application : some from javaTpoints

Service : IaaS

Runtime Cloud : runtimecloud.com

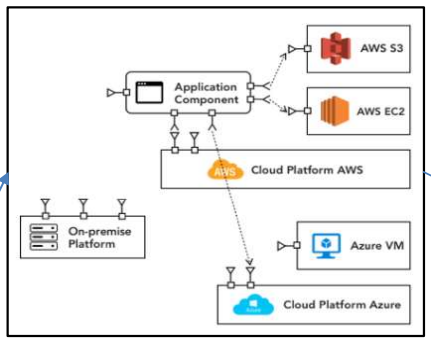
Inftrastructure : odoo ect.

Security : CASB

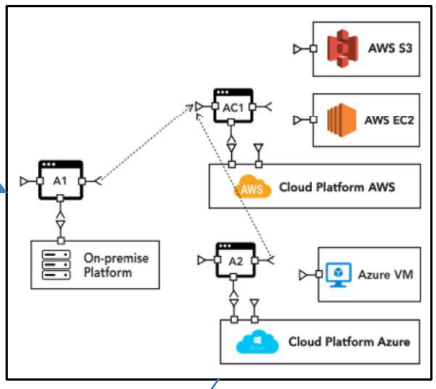
Internet : CloudZero ect.

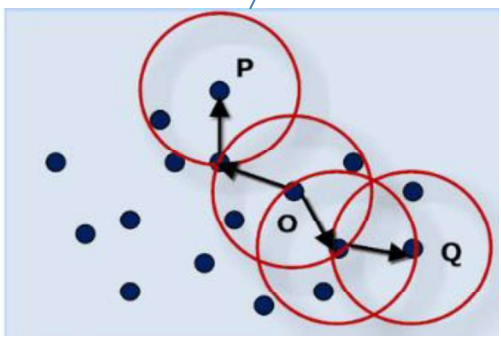
Platform : Azure ect.

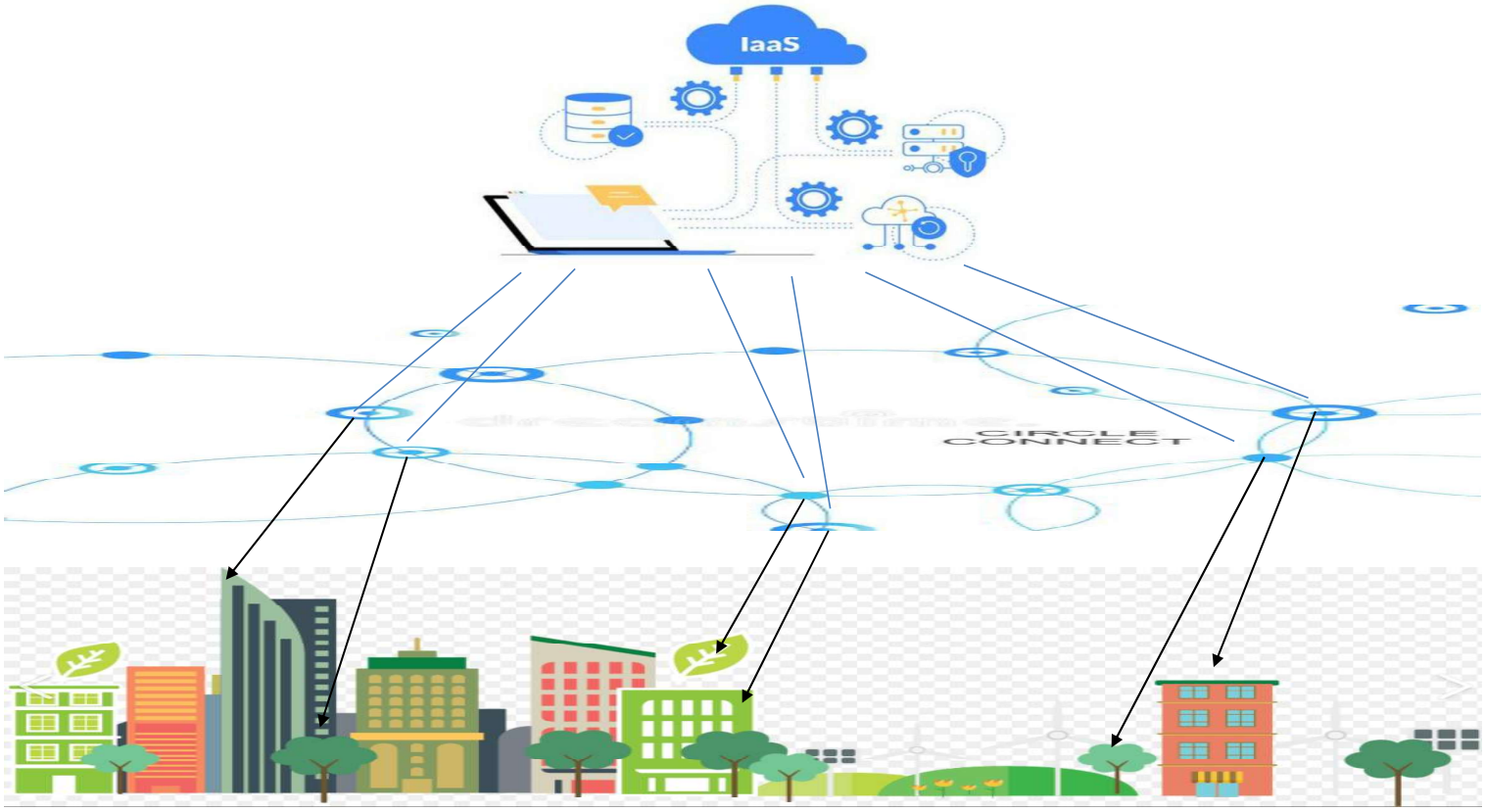
multicloud

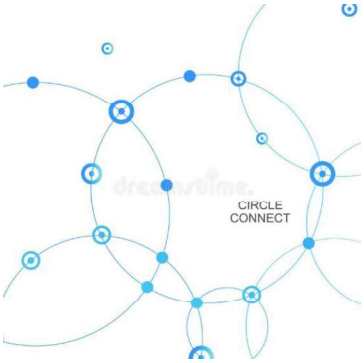


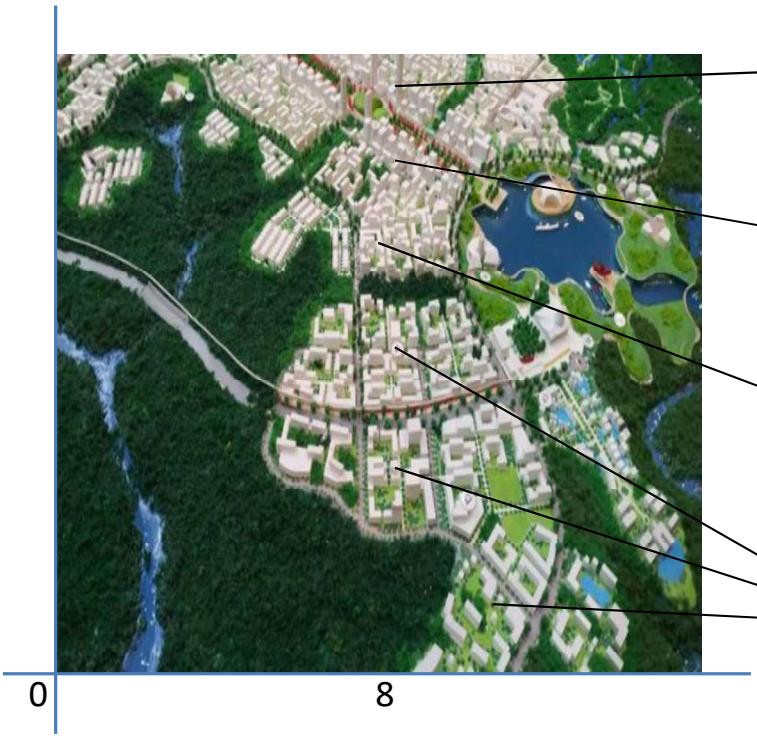
hybrid






IaaS
CIRCLE
CONNECT


CIRCLE
CONNECT

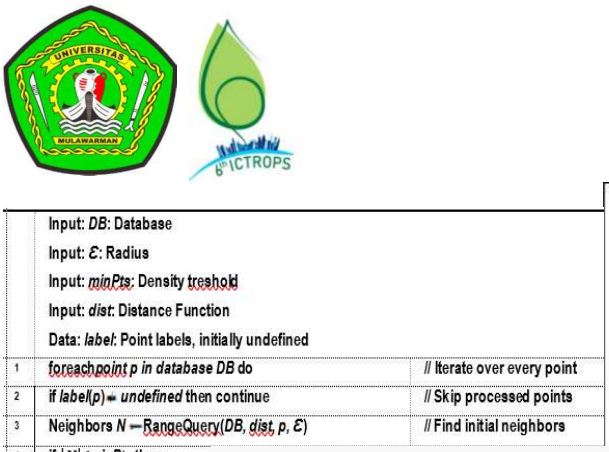


n = 150	Norm. (X2, X3)	Norm. (X1, X4)
1	8	9
2	8	9
...	...	...
150	7	8

n = 60	Norm. (X2, X3)	Norm. (X1, X4)
1	8	9
2	8	7
...	...	...
60	8	8

n = 30	Norm. (X2, X3)	Norm. (X1, X4)
1	8	9
2	8	7
...	...	...
30	7	6

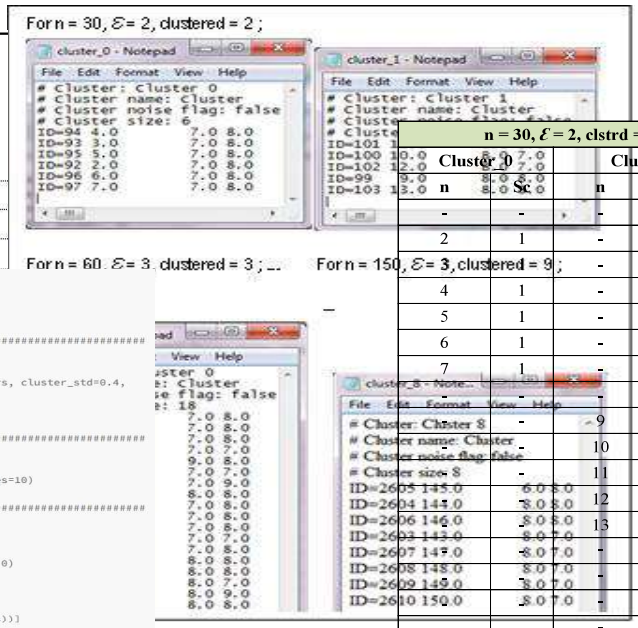
...



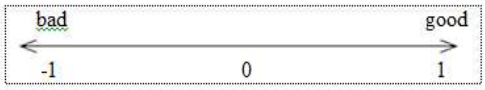
Input: *DB*: Database
Input: *ℰ*: Radius
Input: *minPts*: Density treshold
Input: *dist*: Distance Function
Data: *label*: Point labels, initially undefined

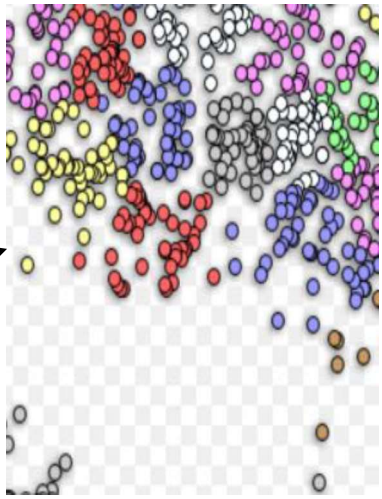
```
1  foreach point p in database DB do                    // Iterate over every point
2  if label(p) ← undefined then continue                // Skip processed points
3  Neighbors N ← RangeQuery(DB, dist, p, ℰ)             // Find initial neighbors
4  if |N|<minPts then
5      label(p) ← Noise
6      continue
7  c ← next cluster label
8  label(p) ← c
9  Seed set S ← N \ {p}
10 Foreach q in S do
11     if label(q) = Noise the
12     if label(q) ← undefine
13     Neighbors N ← Rang
14     label(q) ← c
15     if |N|<minPts then cc
16     S ← N
```

```
import numpy as np
from sklearn.datasets import make_blobs
from sklearn.preprocessing import StandardScaler

# #############################################################################
# Generate sample data
centers = [[1, 1], [-1, -1], [1, -1]]
X, labels_true = make_blobs(n_samples=750, centers=centers, cluster_std=0.4,
                            random_state=0)
X = StandardScaler().fit_transform(X)

# #############################################################################
# Compute DBSCAN
from dbscan import DBSCAN
labels, core_samples_mask = DBSCAN(X, eps=0.3, min_samples=10)

# #############################################################################
# Plot result
import matplotlib.pyplot as plt

n_clusters_ = len(set(labels)) - (1 if -1 in labels else 0)
n_noise_ = list(labels).count(-1)
unique_labels = set(labels)
colors = [plt.cm.Spectral(each)
          for each in np.linspace(0, 1, len(unique_labels))]

for k, col in zip(unique_labels, colors):
    if k == -1:
        # Black used for noise.
        col = [0, 0, 0, 1]
    class_member_mask = (labels == k)
    xy = X[class_member_mask & core_samples_mask]
    plt.plot(xy[:, 0], xy[:, 1], 'o', markerfacecolor=tuple(col),
             markeredgecolor='k', markersize=14)
    xy = X[class_member_mask & ~core_samples_mask]
    plt.plot(xy[:, 0], xy[:, 1], 'o', markerfacecolor=tuple(col),
             markeredgecolor='k', markersize=6)

plt.title('Estimated number of clusters: %d' % n_clusters_)
plt.show()
```



n = 30, ℰ = 2, clstrd = 2				n = 60, ℰ = 3, clstrd = 3	
Cluster_0		Cluster_1		Cluster_0	
n	Sc	n	Sc	n	Sc
-	-	-	-	1	0.160508
2	1	-	-	2	0.381013
3	1	-	-	3	0.381013
4	1	-	-	4	0.381013
5	1	-	-	5	0.381013
6	1	-	-	6	0.381013
7	1	-	-	7	0.381013
-	-	-	-	8	0.250766
-	-	-	9	9	0.381013
-	-	-	10	10	0.381013
-	-	-	11	11	0.381013
-	-	-	12	12	0.381013
-	-	-	13	13	0.381013
-	-	-	-	14	0.250766
-	-	-	-	15	0.250766
-	-	-	-	16	0.250766
-	-	-	-	17	0.250766
-	-	-	-	18	0.250766
Average	***1***	**Average**	***0.487868***	**Average**	***0.325347***





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