Similarity Plugin

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CHAPTER

ONE

CONCEPT ALGORITHM

This plugin has four concept there are Mapcurve, Squential, Nearest Neighbour, and Wilkersat. Mapcurve method is used for similarity calculation. The other method is used for searching the matching feature on layer. User determine the treshold of similarity to make sure the map is similar in some confidence interval.

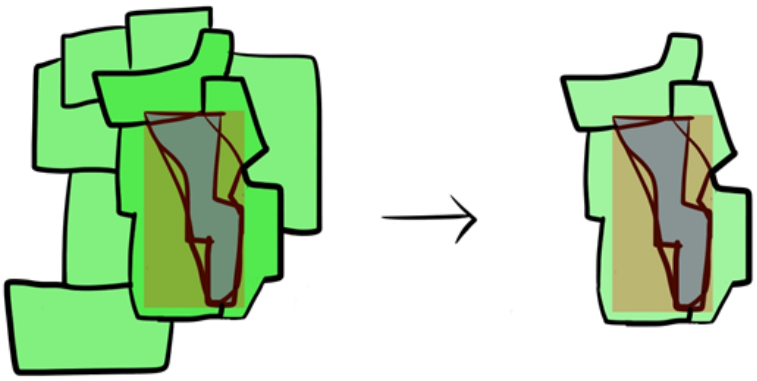
1.1 Mapcurve (Hargrove et al. 2006)

Mapcurves is method for checking similarity between two maps. Mapcurves Algorithm is developed by Hargrove et al. (2006). Mapcurves can calculate the similarity proportion. Mapcurve can be applied in vector maps.

$GOF_{Mapcurves} = \sum \frac{C}{C+A} \times \frac{C}{C+B}$

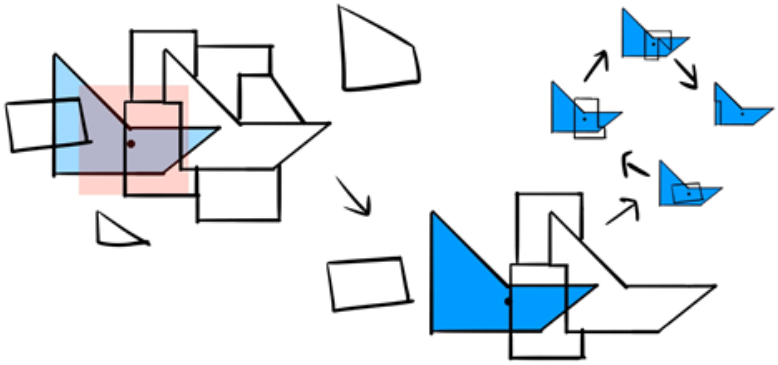
1.2 Squential

Squential Method will checking the features in layer within each bounding box (bb) features.



1.3 Nearest Neighbour

Nearest Neighbour Method will checking the features in layer within determined box. Box will contructed in a radius. Radius is determined by user.



The geometry feature will translated to the center of neighbour before calculating the similarity score.

1.4 Wilkerstat

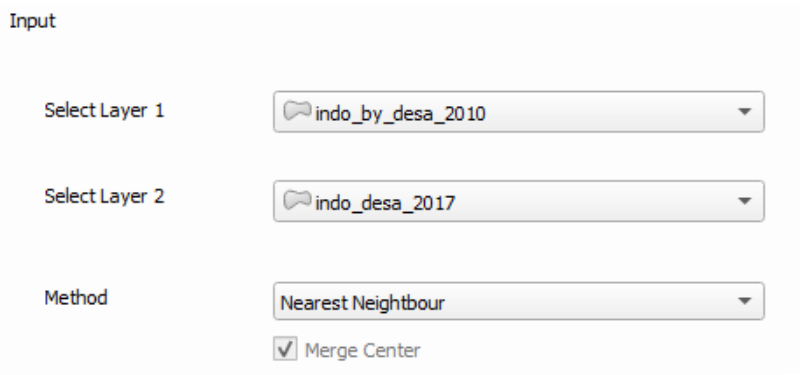
Wilkerstat Method depends on database system in BPS. The method is matching the primary keys. The keys are PROVNO, KABKOTNO, KECNO, DESANO (see https://sig.bps.go.id/)

CHAPTER

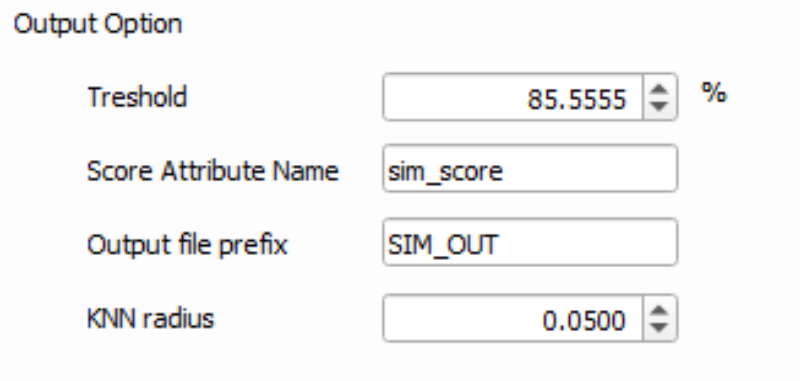
TWO

USER GUIDE

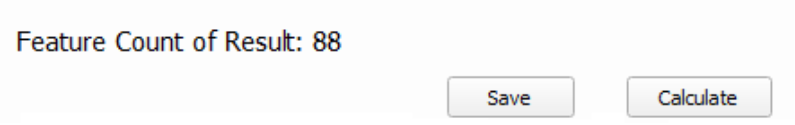
You can choose the layer in input section on Select Layer 1 combo box and Select Layer 2 combo box. Method can be choosed in method combo box. Wilkerstat Method will activate merge center check box. If merge center cheked, the calculation process will translate geometry to the center of mathcing geometry.



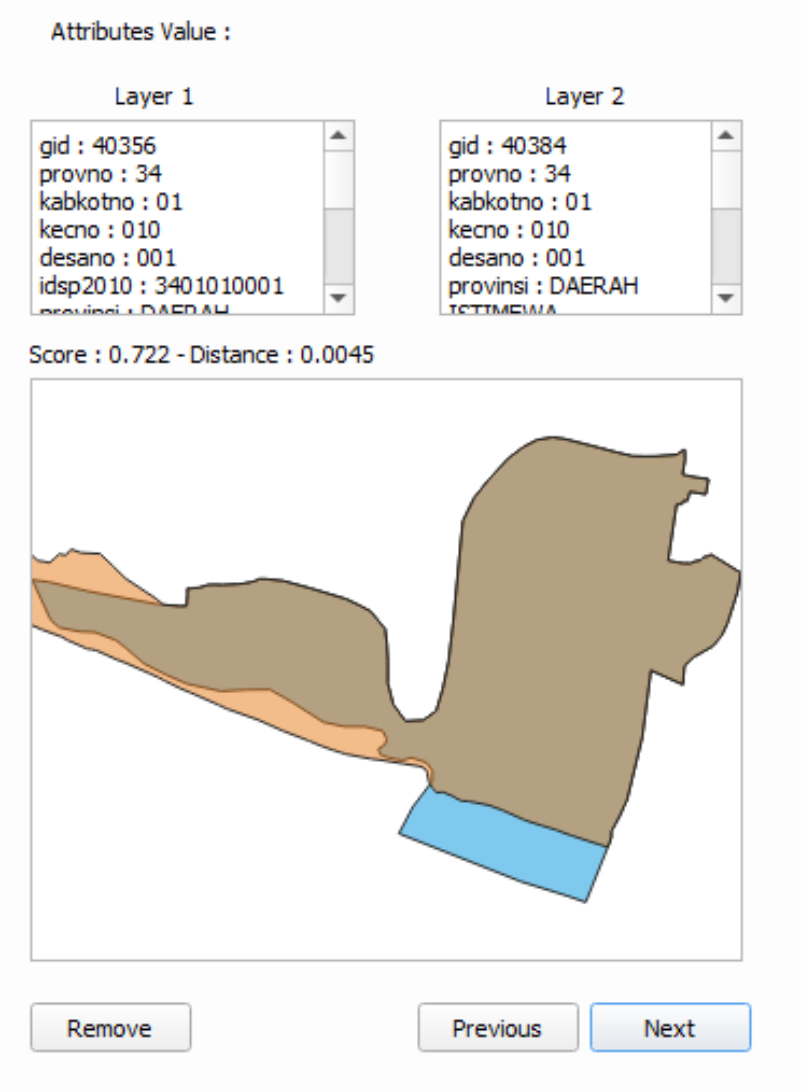
You can edit the output option according the process. Threshold, KNN Radius (if you using NN Method), score attribute name, and layer prefix name.



After you input all option you can click calculation button. After calculation save button will enabled. Save button can save your result to layer in QGIS project.



After calculation excecuted you can preview the result in preview section.


Attributes Value :
Layer 1
gid : 40356
provno : 34
kabkotno : 01
kecno : 010
desano : 001
idsp2010 : 3401010001
Layer 2
gid : 40384
provno : 34
kabkotno : 01
kecno : 010
desano : 001
provinsi : DAERAH
Score : 0.722 - Distance : 0.0045
Remove
Previous
Next

CHAPTER

THREE

PLUGIN ATTRIBUT DIALOG CLASSES

All attribute in this plugin classes

3.1 Class: CalcDialog

msgLabel : QLabel
First line message in dialog

msgLabel2 : QLabel
Second line message in dialog

buttonBox : QDialogButton
Button dialog to accept and reject the condition on the message

3.2 Class: SimilarityPlugin

dlg : SimilarityPluginDialog
Main plugin dialog

dialogCalc : CalcDialog
Caution dialog to convincing the user of large data checking

similarLayer : list=[]
The result of calculation process

previewLayer : int=0
Current index similarLayer that previewed in canvas

3.3 Class: SimilarityPluginDialog

attrOutlineEdit : QLineEdit
Inputation interface for attribute name score in attribute table in string (text)

calcBtn : QPushButton
Button for exceuting calculation

layerSel1 : QgsMapComboBox
Combo Box for selecting first layer

layerSel2 : QgsMapComboBox
Combo Box for selecting second layer

lineEditTreshold : QDoubleSpinBox
Inputation for similarity score treshold in float (number)

mainTab : QWidget
Tab for the main menu

mergeCenterCheck : QCheckBox
Check box for calculation with centering the geometry to another geometry

methodComboBox : QCheckBox
Combo box for selecting the checking similarity method

nextBtn : QPushButton
Button for preview the next feature in similarity list result

nnRadiusEdit : QDoubleSpinBox
Inputation the radius tolerance (The number is according to the projection unit scale)

prefLineEdit : QLineEdit

previewAttr : QLineEdit

previewAttr_2 : QLineEdit

previousBtn : QPushButton
Button for preview the previous feature in similarity list result

SimilarityPluginDialogBase : QDialog
Base plugin window dialog

tabWidget : QTabWidget
Tab widget in the plugin

widgetCanvas : QgsMapCanvas
Canvas widget in preview section for previewing the result

3.4 Class: WarnDialog

msgLabel : QLabel
The warning message

noBtn : QPushButton
Button for reject the condition

yesBtn : QPushButton
Button for accept the condition

Class: SimpleWarningDialog

msgLabel : QLabel
The warning message

okBtn : QPushButton
Ok condition

CHAPTER

FOUR

PLUGIN DIALOG INTERACTION

Interaction method is stored in SimilarityPlugin Class as its method

4.1 Input section

methodChange(*self*)
Change on interaction method combobox

4.2 Preview section

resultPreview(*self*)
Activate preview section

attrPrinter(*self*, *fieldList: object*, *feature: QgsFeature*, *place: QTextEdit*)
Print feature atrribute info on text edit in preview section

Parameters

- **fieldList** (*object*) – Iterable field value object
- **feature** (*QgsFeature*) – The feature will be printed
- **place** (*QTextEdit*) – The place atrribute will be printed

refreshPreview(*self*)
redraw Canvas preview

nextPreview(*self*)
next result features

nextPrevious(*self*)
previous result features

rmFeatResult(*self*)
Remove the current result

rmWarn(*self*)
Warning dialog to prevent accidentally remove result

4.3 Action section

addScoreItem(*self*)
Adding result score

calculateDialogAccepted(*self*)
Interaction when self.dialogCalc accepted

calculateClicked(*self*)
Interaction when self.dlg.calcBtn clicked

calculateDialogRejected(*self*)
Interaction when self.dialogCalc rejected

registerToProject(*self*)
Interaction when self.dlg.saveBtn clicked

CHAPTER

FIVE

PLUGIN CALCULATION METHOD

Calculation method is stored in SimilarityPlugin Class as its method

5.1 calcMapCurvesGeom

calcMapCurvesGeom(*self*, *g: QgsGeometry*, *g2: QgsGeometry*)

Calculate the score between the geometry in float number using GOF Mapcurves (Hargrove et al. 2006)

Parameters

- **self** (*SimilarityPlugin*) – class parent
- **g** (*QgsGeometry*) – first geometry will be checked
- **g2** (*QgsGeometry*) – second geometry will be checked

Returns float

5.2 calcMapCurves

calcMapCurves(*self*, *feature: QgsFeature*, *feature2: QgsFeature*)

Calculate the score and save to self.similarLayer. Score saved in float number using GOF Mapcurves (Hargrove et al. 2006)

Parameters

- **self** (*SimilarityPlugin*) – class parent
- **feature** (*QgsFeature*) – first feature will be checked
- **feature2** (*QgsFeature*) – second feature will be checked

Returns null

5.3 calcSq

calcSq(*self*, *layer: QgsVectorLayer*, *layer2: QgsVectorLayer*)

Check the maps similarity squentially

Parameters

- **self** (*SimilarityPlugin*) – class parent
- **layer** (*QgsVectorLayer*) – first layer will checked
- **layer2** (*QgsVectorLayer*) – second layer will checked

Returns null

5.4 calcKNN

calcKNN(*self*, *layer: QgsVectorLayer*, *layer2: QgsVectorLayer*)

Check each feature within radius bounding box. Radius distance using euclidean.

Parameters

- **self** (*SimilarityPlugin*) – class parent
- **layer** (*QgsVectorLayer*) – first layer will checked
- **layer2** (*QgsVectorLayer*) – second layer will checked

Returns null

5.5 calcWK

calcWK(*self*, *layer: QgsVectorLayer*, *layer2: QgsVectorLayer*)

Match each feature the primary key in map, see https://sig.bps.go.id/

Parameters

- **self** (*SimilarityPlugin*) – class parent
- **layer** (*QgsVectorLayer*) – first layer will checked
- **layer2** (*QgsVectorLayer*) – second layer will checked

Returns null

5.6 translateCenterGeom

translateCenterGeom(*self*, *g: QgsGeometry*, *target: QgsGeometry*)

Translate geometry

Parameters

- **self** (*SimilarityPlugin*) – class parent
- **layer** (*QgsVectorLayer*) – first layer will checked
- **layer2** (*QgsVectorLayer*) – second layer will checked

Returns QgsGeometry

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ABOUT PLUGIN

Plugin created by Pandu Wicaksono and Takdir. This plugin has GNU GPLv2 License. There is no external library included in this plugin. Furhter information you can contact us at panickspa@gmail.com.