Crime Trend Analysis by Changes of Spatial Autocorrelation and Hot-spot

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Crime trend analysis follows changes of Spatial autocorrelation and Hot-spot.
**SA (Moran’s I)**

\[
I = \frac{n \sum^n_{i=1} \sum^n_{j=1} w_{ij} (x_i - \bar{x})(x_j - \bar{x})}{\sum^n_{i=1} \sum^n_{j=1} w_{ij} (x_i - \bar{x})^2}
\]

**THE ROOK DISTANCE**

**Crime rate per population**

**THE ROOK DISTANCE**

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LISA (Local Moran’s I)

\[
\text{LISA} = \frac{1}{n} \sum_{i,j=1}^{n} w_{ij} (x_i - \bar{x}) (x_j - \bar{x})
\]

**Rook – Crime for 2011~2013**

<table>
<thead>
<tr>
<th>Type</th>
<th>Crime occurrence</th>
<th>Per population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five major</td>
<td>Robbery</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Murder</td>
<td>Assault</td>
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**Distance – Crime for 2011~2013**

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**Crime trend analysis follows changes of Spatial autocorrelation and Hot-spot**
Discussion

Number of Group pattern

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Type of crime pattern

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Area pattern : Mapo-gu

Songpa-gu: Hot-spot
Nowon-gu: Cold-spot
Seocho-gu: Hot-spot or LH
Dongjak-gu, Yangcheon-gu : LH

Crime trend analysis follows changes of Spatial autocorrelation and Hot-spot
Meaning & Hereafter research

1. Grasp the **spatial effect per area** with spatial autocorrelation analysis

   - Imply that crime prevention activity have to **consider the spatial dependence**
   - Need the **influence factor** research

2. Explore **HH, LL, HL, LH** by LISA

   - Do the crime prevention activity centrally the **Hot-spot area**
   - Need the **type changes factor** research

Crime trend analysis follows changes of **Spatial autocorrelation and Hot-spot**
Thank you for listening.