> wm\_q <- poly2nb(filtered\_data\_2019, queen=TRUE, snap = 1)

Warning: some observations have no neighbours;

if this seems unexpected, try increasing the snap argument.Warning: neighbour object has 2 sub-graphs;

if this sub-graph count seems unexpected, try increasing the snap argument.

> summary(wm\_q)

Neighbour list object:

Number of regions: 69

Number of nonzero links: 284

Percentage nonzero weights: 5.965133

Average number of links: 4.115942

1 region with no links:

42

2 disjoint connected subgraphs

Link number distribution:

0 1 2 3 4 5 6 7 9

1 2 7 17 15 11 12 3 1

2 least connected regions:

46 63 with 1 link

1 most connected region:

61 with 9 links

> longitude <- map\_dbl(filtered\_data\_2019$geometry, ~st\_centroid(.x)[[1]])

> latitude <- map\_dbl(filtered\_data\_2019$geometry, ~st\_centroid(.x)[[2]])

> coords <- cbind(longitude, latitude)

> head(coords)

longitude latitude

[1,] 1115483.2 1765518

[2,] 645239.0 1617118

[3,] 675514.6 1523087

[4,] 998785.3 2013040

[5,] 762475.6 1505514

[6,] 801701.6 1774503

> plot(filtered\_data\_2019$geometry, border="lightgrey", main = "Neighborhood Structure", xlab = "Longitude", ylab = "Latitude")

> plot(wm\_q, coords, pch = 19, cex = 0.2, add = TRUE, col= "red")

A map of a neighborhood structure

Description automatically generated

> # Create a neighbors list based on contiguity (sharing borders)

> nb <- poly2nb(filtered\_data\_2019)

Warning: some observations have no neighbours;

if this seems unexpected, try increasing the snap argument.Warning: neighbour object has 2 sub-graphs;

if this sub-graph count seems unexpected, try increasing the snap argument.

> # Convert the neighbors list to a weights list

> lw <- nb2listw(nb, style = "W", zero.policy = TRUE)

> # Perform Moran's I test for revenue\_all

> moran\_test <- moran.test(filtered\_data\_2019$revenue\_all, lw)

> print(moran\_test)

Moran I test under randomisation

data: filtered\_data\_2019$revenue\_all

weights: lw

n reduced by no-neighbour observations

Moran I statistic standard deviate = -0.19137, p-value = 0.5759

alternative hypothesis: greater

sample estimates:

Moran I statistic Expectation Variance

-0.026521483 -0.014925373 0.003671806

> # Perform Local Moran's I (LISA)

> local\_moran <- localmoran(filtered\_data\_2019$revenue\_all, lw)

>

> # Add the LISA results to the dataset

> filtered\_data\_2019$lisa <- local\_moran[, "Ii"]

>

> # Visualize LISA results

> tm\_shape(filtered\_data\_2019) +

+ tm\_polygons("lisa", palette = "RdYlBu", title = "Local Moran's I - LISA") +

+ tm\_layout(title = "LISA for Tourism Revenue")

A map of thailand with a red area

Description automatically generated

Variable(s) "lisa" contains positive and negative values, so midpoint is set to 0. Set midpoint = NA to show the full spectrum of the color palette.

> # Perform Emerging Hotspot Analysis (assuming spacetime object has been created)

> hotspot\_analysis <- st\_gistar(filtered\_data\_2019$revenue\_all, lw)

Error in st\_gistar(filtered\_data\_2019$revenue\_all, lw) :

could not find function "st\_gistar"