

R source code for LOESS model application for Risk data

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Library (ggplot2)
sink("results.txt")
print("Run LOESS model")
print(date())
# upload the information of the phone calls, includes the population of each municipality
datos <- read.csv("input_data.csv")
# calculates the LOESS model between RISK and PHONE CALLS,
# not weighted model
datos.loess<-loess(datos$LLAMADAS~datos$RIESGO,span=0.75, degree=2)
print(summary(datos.loess))
# predicts the number of phone calls expected based on risk level
llamadas.predict<-predict(datos.loess, data.frame(y=datos$LLAMADAS))
datos$Ajustadas1<-llamadas.predict<-round(llamadas.predict, digits=0)
# calculates the LOESS model between RISK and PHONE CALLS, taking into account
# the population as weight, PHONE CALLS is the response variable (dependent)
# RISK is the independent variable
datos.loess<-loess(datos$LLAMADAS~datos$RIESGO,span=0.75,
weight=1/datos$Población, degree=2)
print(summary(datos.loess))

# predicts the number of phone calls expected based on risk
llamadas.predict<-predict(datos.loess, data.frame(y=datos$LLAMADAS))
# round up the calls and save them as a new column of the data-frame
datos$Ajustadas2<-llamadas.predict<-round(llamadas.predict, digits=0)
print(datos)
write.csv(datos, "ModeloLOESS.csv")
# LOESS graphic
ggplot(datos, aes(RIESGO, LLAMADAS))+
  geom_point()+
  stat_smooth()
ggsave(file="GraphLOESS.png")

# LOESS and Point tags Graph
ggplot(datos, aes(RIESGO, LLAMADAS))+
  geom_point()+
  stat_smooth()+
  geom_text(aes(label=MUNICIPIO), hjust=0, vjust=0)+
  facet_grid(.~CLASE, scales="free", space="free")
ggsave(file="GraphLOESStexts.png")

# LOESS and Point tags Graph
ggplot(datos, aes(LLAMADAS, RIESGO))+
  geom_point()+
  stat_smooth()+
  facet_grid(.~CLASE, scales="free", space="free_y")
ggsave(file="GraphLOESS-RiskPhoneCalls_texts.png")

# LOESS graph in logarithmic scale
ggplot(datos, aes(RIESGO, LLAMADAS))+
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upload data
Draw the point cloud
Draw the LOESS fit line

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```

geom_text()+
geom_point()+ # Draw the point cloud
stat_smooth # Draw the LOESS fit line
scale_y_log10() # Draw Y-axis in logarithmic scale
ggsave(file="GraphLOESS-Logarithmic_scale.png")

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# LOESS fit line and standard deviation Graph
ggplot(datos, aes(RIESGO, LLAMADAS, label=rownames(datos)))+ # Upload data
stat_smooth(geom = "point")+ # Draw LOESS fit line as points
stat_smooth(geom = "errorbar") # Draw standard deviation
ggsave(file="LOESS_line.png")

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ggplot(datos,aes(RIESGO,
LLAMADAS,color=factor(RIESGO)))+geom_point()+scale_size("Población")+
theme(legend.position="none")
ggsave(file="PhoneCalls_SpatialDistribution.png")

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ggplot(datos, aes(RIESGO, LLAMADAS, color=factor(Población)))+
geom_point(aes(size = Población))+theme(legend.position="none")
ggsave(file="PhoneCalls_UrbanCenters_Distribution.png")

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print("----- //// ----")
print(date())
sink()

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