General Linear regression: EXAMPLE

job.satisfaction.data<- read.csv(file="Desktop/UCI\_R/Examples/Data/NormalExampleData.csv", header=TRUE, sep=","))

install.packages("rcompanion")

library(rcompanion)

plotNormalHistogram(job.satisfaction.data$score)

summary(fitted.model<- glm(score ~ gender+ age + educ, data=job.satisfaction.data, family=gaussian(link=identity))

print(predict(fitted.model, data.frame(gender="F", age=40, educ="bachelor")))

HR.data<-read.csv(file="Desktop/UCI\_R/exercises/Data/NormalExerciseData.csv", header=TRUE, sep=",")

install.packages("rcompanion")

library(rcompanion)

plotNormalHistogram(HR.data$HR)

summary(fitted.model<- glm(HR ~ age + gender + ethnicity+BMI + nmeds+AQI, data=HR.data, family=gaussian(link=identity)))

print(predict(fitted.model, data.frame(age=50, gender="M",

ethnicity="Hispanic", BMI=20, nmeds=0, AQI="moderate")))

real.estate.data<- read.csv(file="Desktop/UCI\_R/examples/Data/GammaExampleData.csv", header=TRUE, sep=",")

price10K<- real.estate.data$price/10000 sqftK<-real.estate.data$sqft/1000 lotsizeK<-real.estate.data$lotsize/1000

install.packages("rcompanion") library(rcompanion) plotNormalHistogram(price10K)

summary(fitted.model<- glm(price10K ~ nbedrooms + nbathrooms +

sqftK + heating.rel + AC.rel + lotsizeK, data=real.estate.data,

family=Gamma(link=log)))

print(10000\*predict(fitted.model, type="response", data.frame(beds=4, baths=2, sqftK=1.68, heating="central", AC="no", lotK=5)))

QIscore.data<- read.csv(file="Desktop/UCI\_R/exercises/Data/GammaExerciseData.csv", header=TRUE, sep=",")

install.packages("rcompanion") library(rcompanion) plotNormalHistogram(QIscore.data$score)

summary(fitted.model<- glm(score ~ desgn + wrkyrs + priorQI, data=QIscore.data, family=Gamma(link=log)))

print(pred.score<- predict(fitted.model, type="response",

data.frame(desgn="nurse", wrkyrs=7, priorQI="yes")))

companies.data<- read.csv(file="Desktop/UCI\_R/examples/Data/LogisticExampleData.csv",

header=TRUE, sep=",")

summary(fitted.model<- glm(approach.rel ~ ownership + nemployees,

data=companies.data, family=binomial(link=logit)))

print(predict(fitted.model, type="response",

data.frame(ownership="sole", nemployees=40)))

rate.data<- read.csv(file="./LogisticExerciseData.csv", header=TRUE,

sep=",")

default.rel<- relevel(rate.data$default, ref="No")

summary(fitted.model.logit<- glm(default.rel~LTV+age+income, data=rate.data, family=binomial(link=logit)))

print(predict(fitted.model.logit, type="response", data.frame(LTV=50,

age=50, income="high")))

hospitalstay.data<- read.csv(file="Desktop/UCI\_R/examples/Data/PoissonExampleData.csv",

header=TRUE, sep=",")

summary(fitted.model<- glm(days ~ gender + age + illness,

data=hospitalstay.data, family=poisson(link=log)))

print(predict(fitted.model, data.frame(gender="M", age=55,

illness="no"), type="response"))

insurance.data<-read.csv(file="Desktop/UCI\_R/exercises/Data/PoissonExerciseData.csv",

header=TRUE, sep=",")

summary(fitted.model<- glm(accidents ~ gender + age + miles,

data=insurance.data, family=poisson(link=log)))

print(predict(fitted.model, data.frame(gender="F", age=35, miles=100),

type="response"))

smoking.data<-read.csv(file="Desktop/UCI\_R/examples/Data/ZIPExampleData.csv", header=TRUE,

+ sep=",")

install.packages("pscl")

library(pscl)

summary(fitted.model<- zeroinfl(cigarettes ~ gender + age | health,

data=smoking.data))

print(predict(fitted.model, data.frame(gender="M", health="good",

age=50)))

health.data<- read.csv(file="Desktop/UCI\_R/exercises/Data/ZIPExerciseData.csv", header = TRUE,

sep=",")

install.packages("pscl")

library(pscl)

summary(fitted.model<- zeroinfl(attacks ~ BMI + age + gender | smoking,

data=health.data))

print(predict(fitted.model, data.frame(BMI=21.2, age=60, gender="M",

smoking="yes")))

libraries.data<- read.csv(file="Desktop/UCI\_R/examples/Data/BetaExampleData.csv", header=TRUE,

sep=",")

library(betareg)

summary(fitted.model<- betareg(propontime ~ nbooks + ncardholders +

location, data=libraries.data, link="logit"))

print(predict(fitted.model, data.frame(nbooks=15, ncardholders=2.5,

location="rural")))

birds.data<-read.csv(file="Desktop/UCI\_R/exercises/Data/BetaExerciseData.csv", header=TRUE, sep=",")

library(betareg)

summary(fitted.model<- betareg(propmigrated ~ mass + wingspan + distance,

data = birds.data, link="logit"))

prop.pred<- predict(fitted.model, data.frame(mass=0.6, wingspan=65,distance=1.65))

print(num.pred<- prop.pred\*70)

cholesterol.data<-read.csv(file="Desktop/UCI\_R/Examples/Data/LongitudinalNormalExampleData.csv",header=TRUE, sep=",")

library(reshape2)

longform.data<- melt(cholesterol.data, id.vars=c("id", "gender", "age"),

variable.name = "LDLmonth", value.name="LDL")

month<-ifelse(longform.data$LDLmonth=="LDL0", 0,

ifelse(longform.data$LDLmonth=="LDL6", 6,

ifelse(longform.data$LDLmonth=="LDL9",9,24)))

library(rcompanion)

plotNormalHistogram(longform.data$LDL)

library(nlme)

summary(fitted.model<-lme(LDL ~ gender+age+month,

random =~ 1+month|id, data=longform.data))

print(predict(fitted.model, data.frame(gender=0, age=48, month=3),level=0))

library(rcompanion)

plotNormalHistogram(longform.data$pulse)

library(nlme)

summary(fitted.model<- lme(pulse ~ gender + age + oxygen + runtime +

condition, random =~ 1 + condition|id, control=lmeControl(opt="optim"),

data=longform.data))

print(predict(fitted.model, data.frame(gender=0, age=36, condition=1,

oxygen=40.2, runtime=10.3), level=0))

dosages.data<- read.csv(file="Desktop/UCI\_R/Examples/Data/LongitudinalLogisticExampleData.csv",

header=TRUE, sep=",")

library(reshape2)

longform<-melt(dosages.data, id.vars=c("patid","dosage", "gender"),

variable.name="weekn", value.name="effects")

week<- ifelse(longform$weekn=="week1",1,ifelse(longform$weekn=="week3",3,

ifelse(longform$weekn=="week7",7,16)))

library(lme4)

summary(fitted.model<- glmer(effects~dosage+gender+week+(1+(week|patid)),

data=longform,family=binomial(link='logit')))

print(predict(fitted.model, data.frame(patid=29, dosage="A", gender="F",

week=7), re.form=NA, type="response"))

library(lme4)

summary(fitted.model<- glmer(npatches ~ group + weeks + (1 + weeks|patid),

data=longform.data, family=poisson(link="log")))

print(predict(fitted.model, data.frame(patid=11, group="Tx", weeks=5),re.form=NA, type="response"))

summary(fitted.model<- lmer(qol ~ relation + depression + visit

+ (1 + visit|family)+ (1 + visit|family:individual),

control=lmerControl(calc.derivs = FALSE), data=longform.data))

library(rcompanion)

plotNormalHistogram(school$score)

library(lme4)

summary(fitted.model<- lmer(score ~ API + classsize + year

+ (1 + year|school) + (1 + year|school:subject), data=school))