**Assignment 5**

**KNN code**

**Name: Motbhare Subodh Uddhav**

**Roll No: 92**

**Branch & Div: Computer Engineering & C**

**Gr No: 12120132**

**Source Code**

library(ggplot2)

x = c(0.8, 1, 1.2, 0.8, 1.2, 4.3, 3.8, 4.8, 3.8, 4.2, 4.4, 4.4, 3.2, 3.2, 3.8, 3.5, 4, 4)

y = c(0.8, 1, 0.8, 1.2, 1.2, 2, 2.8, 2.8, 3.2, 3.2, 2.8, 3.2, 0.4, 0.7, 0.5, 1, 1, 0.7)

z = c(1, 1, 1, 1, 1, 0, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3)

dataset = data.frame(x,y,z)

head(dataset)

plot(dataset$x, dataset$y, col=c("red", "blue", "yellow", "green")[dataset$z])

qplot(x, y, color=factor(z), data = dataset) + scale\_color\_manual(values = c("yellow", "blue", "red", "green"))

test\_pt = c(3,2)

for (i in 1:18) {

ed = sqrt((test\_pt[2] - dataset[i,2])^2 + (test\_pt[1] - dataset[i,1])^2)

dataset$dist\_test\_pt[i] = ed

}

minimum = min(dataset$dist\_test\_pt)

point\_idx = which(dataset$dist\_test\_pt == minimum)

class = dataset[point\_idx,3]

print(paste0("As test point", " is close to point ", point\_idx, " with distance ", minimum, ". Therefore, test point belongs to class ", class))

**Output:**

library(ggplot2)

>

> x = c(0.8, 1, 1.2, 0.8, 1.2, 4.3, 3.8, 4.8, 3.8, 4.2, 4.4, 4.4, 3.2, 3.2, 3.8, 3.5, 4, 4)

> y = c(0.8, 1, 0.8, 1.2, 1.2, 2, 2.8, 2.8, 3.2, 3.2, 2.8, 3.2, 0.4, 0.7, 0.5, 1, 1, 0.7)

> z = c(1, 1, 1, 1, 1, 0, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3)

>

> dataset = data.frame(x,y,z)

> head(dataset)

x y z

1 0.8 0.8 1

2 1.0 1.0 1

3 1.2 0.8 1

4 0.8 1.2 1

5 1.2 1.2 1

6 4.3 2.0 0

>

> plot(dataset$x, dataset$y, col=c("red", "blue", "yellow", "green")[dataset$z])

> qplot(x, y, color=factor(z), data = dataset) + scale\_color\_manual(values = c("yellow", "blue", "red", "green"))

>

> test\_pt = c(3,2)

>

> for (i in 1:18) {

+ ed = sqrt((test\_pt[2] - dataset[i,2])^2 + (test\_pt[1] - dataset[i,1])^2)

+ dataset$dist\_test\_pt[i] = ed

+ }

>

> minimum = min(dataset$dist\_test\_pt)

>

> point\_idx = which(dataset$dist\_test\_pt == minimum)

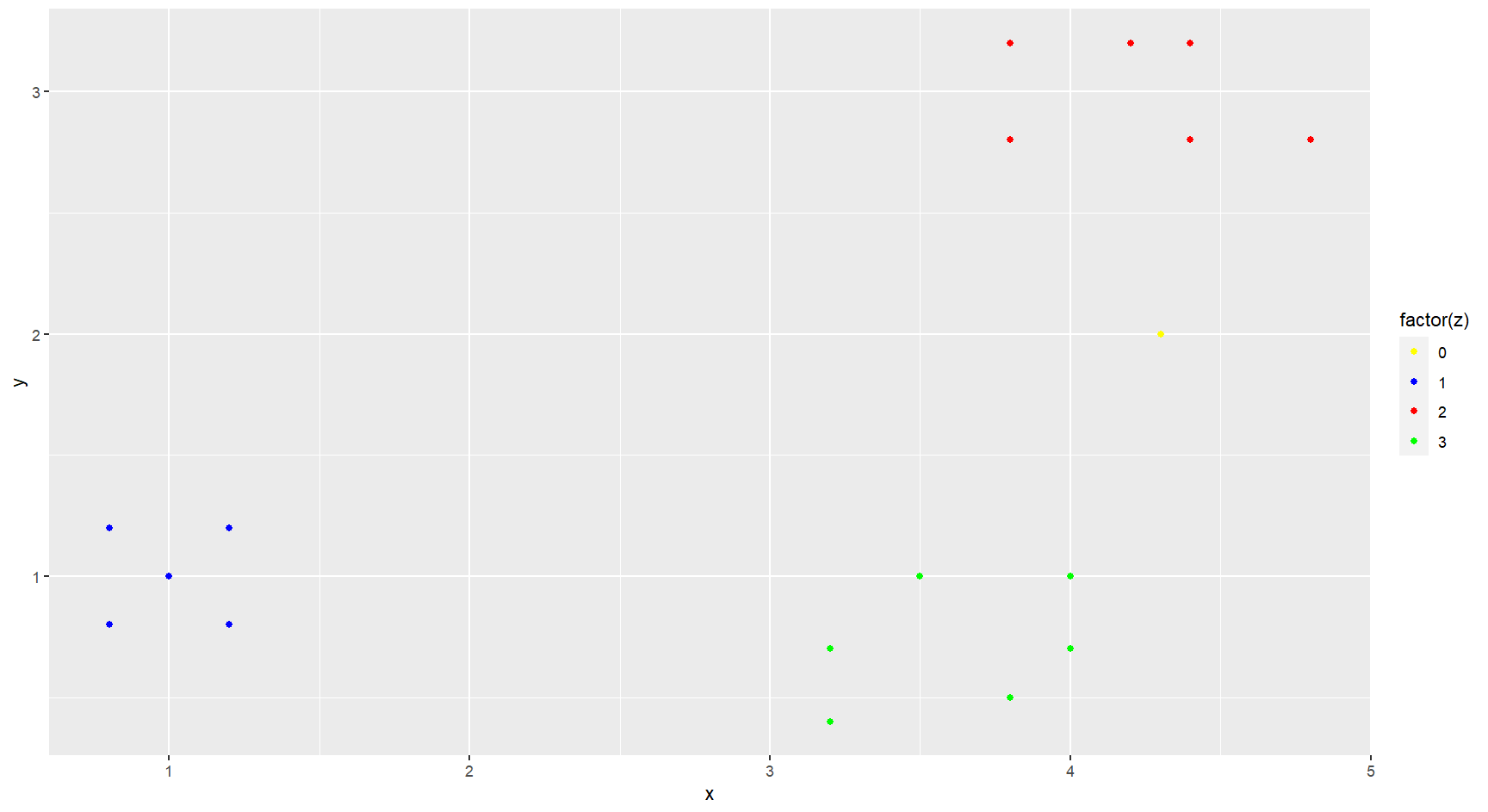
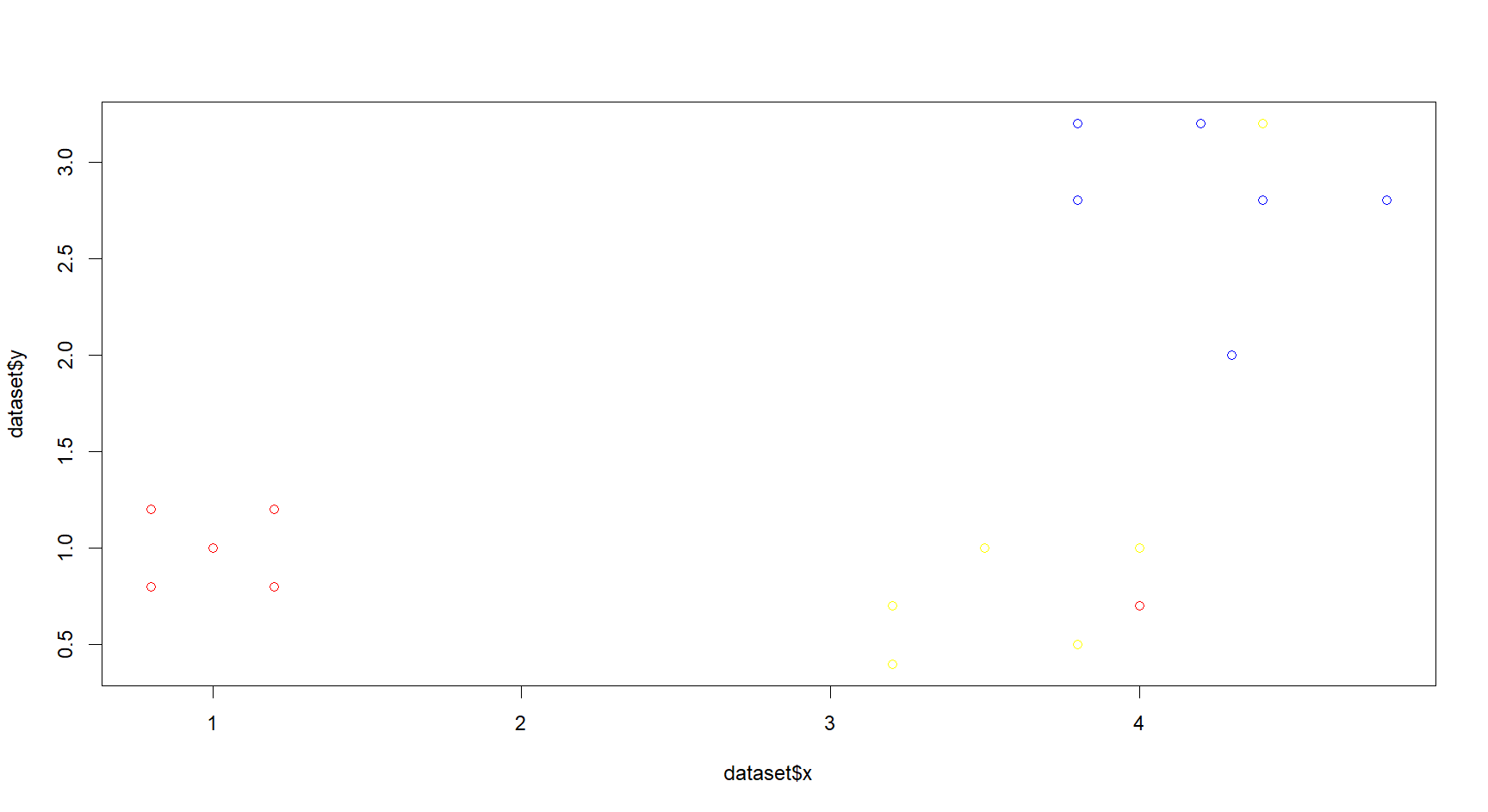
>

> class = dataset[point\_idx,3]

>

> print(paste0("As test point", " is close to point ", point\_idx, " with distance ", minimum, ". Therefore, test point belongs to class ", class))

[1] "As test point is close to point 16 with distance 1.11803398874989. Therefore, test point belongs to class 3"

****