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Batch:A3

Problem Statement: Correlation between different lengths of fish and weight of fish and plotting the regression line

CODE:

```
install.packages("magrittr") # package installations are only needed the first time you use it

install.packages("dplyr")    # alternative installation of the %>%

install.packages("tidyverse")

install.packages("ggplot2")

library(ggplot2)

library(tidyverse)

library(magrittr) # needs to be run every time you start R and want to use %>%

library(dplyr)


mydata<-read.csv(C:\Users\91930\Documents\Fish.csv)

print(mydata)

#Species of fish

#Weight of the fish (in grams)

#Length from the nose to the beginning of the tail (in cm)

#Length from the nose to the notch of the tail (in cm)

#Length from the nose to the end of the tail (in cm)

#Maximal height as % of Length3

#Maximal width as % of Length3



head(mydata)

print(is.data.frame(data))

#Range of Weight column

print(range(mydata$Weight))

#Mean of weights
```

```
print(mean(mydata$Weight))


#Mode
getmode <- function(x)
{
  uniqv <- unique(x)
  uniqv[which.max(tabulate(match(x, uniqv)))]
}
print(getmode(mydata$Weight))       #mode of life expectancy
summary(mydata$Weight)


#Correlation coefficient between Length3 and Weight
n1<-cor(mydata$Length3,mydata$Weight,method="pearson")
print(n1)
#Correlation coefficient between Length2 and weight
n2<-cor(mydata$Length2,mydata$Weight,method="pearson")
print(n2)
#Correlation coefficient between Length1 and weight
n3<-cor(mydata$Length1,mydata$Weight,method="pearson")
print(n3)
#Correlation between Height and Weight
n4<-cor(mydata$Height,mydata$Weight,method="pearson")
print(n4)




boxplot(Height~Weight,data=mydata, col=rainbow(5), xlab="Length3", ylab="Weight")
```

```
#regression model 1

set <- lm(mydata$Length3~mydata$Weight, data =mydata)

 coeffs=coefficients(set);

 print(coeffs)


 set1<-head(mydata,50)



 #plotting the regression line


plot(set1$Length3,set1$Weight,col="red",main="Analysis",abline(lm(set1$Weight~set1$Length3)),c
ex=0.5,pch=16,xlab="Length3",ylab="Weight")


#regression model 2

 set2 <- lm(mydata$Length1~mydata$Weight, data =mydata)

 coeffs=coefficients(set);

 print(coeffs)


 set3<-head(mydata,50)


 #plotting the regression line


plot(set3$Length1,set1$Weight,col="red",main="Analysis",abline(lm(set3$Weight~set3$Length1)),c
ex=0.5,pch=16,xlab="Length3",ylab="Weight")
```

OUTPUT:

```
print(mydata)

   ï..Species Weight Length1 Length2 Length3  Height  Width

1       Bream  242.0    23.2    25.4    30.0 11.5200 4.0200

2       Bream  290.0    24.0    26.3    31.2 12.4800 4.3056

3       Bream  340.0    23.9    26.5    31.1 12.3778 4.6961
```

4	Bream	363.0	26.3	29.0	33.5	12.7300	4.4555
5	Bream	430.0	26.5	29.0	34.0	12.4440	5.1340
6	Bream	450.0	26.8	29.7	34.7	13.6024	4.9274
7	Bream	500.0	26.8	29.7	34.5	14.1795	5.2785
8	Bream	390.0	27.6	30.0	35.0	12.6700	4.6900
9	Bream	450.0	27.6	30.0	35.1	14.0049	4.8438
10	Bream	500.0	28.5	30.7	36.2	14.2266	4.9594
11	Bream	475.0	28.4	31.0	36.2	14.2628	5.1042
12	Bream	500.0	28.7	31.0	36.2	14.3714	4.8146
13	Bream	500.0	29.1	31.5	36.4	13.7592	4.3680
14	Bream	340.0	29.5	32.0	37.3	13.9129	5.0728
15	Bream	600.0	29.4	32.0	37.2	14.9544	5.1708
16	Bream	600.0	29.4	32.0	37.2	15.4380	5.5800
17	Bream	700.0	30.4	33.0	38.3	14.8604	5.2854
18	Bream	700.0	30.4	33.0	38.5	14.9380	5.1975
19	Bream	610.0	30.9	33.5	38.6	15.6330	5.1338
20	Bream	650.0	31.0	33.5	38.7	14.4738	5.7276
21	Bream	575.0	31.3	34.0	39.5	15.1285	5.5695
22	Bream	685.0	31.4	34.0	39.2	15.9936	5.3704
23	Bream	620.0	31.5	34.5	39.7	15.5227	5.2801
24	Bream	680.0	31.8	35.0	40.6	15.4686	6.1306
25	Bream	700.0	31.9	35.0	40.5	16.2405	5.5890
26	Bream	725.0	31.8	35.0	40.9	16.3600	6.0532
27	Bream	720.0	32.0	35.0	40.6	16.3618	6.0900
28	Bream	714.0	32.7	36.0	41.5	16.5170	5.8515
29	Bream	850.0	32.8	36.0	41.6	16.8896	6.1984
30	Bream	1000.0	33.5	37.0	42.6	18.9570	6.6030
31	Bream	920.0	35.0	38.5	44.1	18.0369	6.3063
32	Bream	955.0	35.0	38.5	44.0	18.0840	6.2920
33	Bream	925.0	36.2	39.5	45.3	18.7542	6.7497
34	Bream	975.0	37.4	41.0	45.9	18.6354	6.7473

35	Bream	950.0	38.0	41.0	46.5	17.6235	6.3705
36	Roach	40.0	12.9	14.1	16.2	4.1472	2.2680
37	Roach	69.0	16.5	18.2	20.3	5.2983	2.8217
38	Roach	78.0	17.5	18.8	21.2	5.5756	2.9044
39	Roach	87.0	18.2	19.8	22.2	5.6166	3.1746
40	Roach	120.0	18.6	20.0	22.2	6.2160	3.5742
41	Roach	0.0	19.0	20.5	22.8	6.4752	3.3516
42	Roach	110.0	19.1	20.8	23.1	6.1677	3.3957
43	Roach	120.0	19.4	21.0	23.7	6.1146	3.2943
44	Roach	150.0	20.4	22.0	24.7	5.8045	3.7544
45	Roach	145.0	20.5	22.0	24.3	6.6339	3.5478
46	Roach	160.0	20.5	22.5	25.3	7.0334	3.8203
47	Roach	140.0	21.0	22.5	25.0	6.5500	3.3250
48	Roach	160.0	21.1	22.5	25.0	6.4000	3.8000
49	Roach	169.0	22.0	24.0	27.2	7.5344	3.8352
50	Roach	161.0	22.0	23.4	26.7	6.9153	3.6312
51	Roach	200.0	22.1	23.5	26.8	7.3968	4.1272
52	Roach	180.0	23.6	25.2	27.9	7.0866	3.9060
53	Roach	290.0	24.0	26.0	29.2	8.8768	4.4968
54	Roach	272.0	25.0	27.0	30.6	8.5680	4.7736
55	Roach	390.0	29.5	31.7	35.0	9.4850	5.3550
56	Whitefish	270.0	23.6	26.0	28.7	8.3804	4.2476
57	Whitefish	270.0	24.1	26.5	29.3	8.1454	4.2485
58	Whitefish	306.0	25.6	28.0	30.8	8.7780	4.6816
59	Whitefish	540.0	28.5	31.0	34.0	10.7440	6.5620
60	Whitefish	800.0	33.7	36.4	39.6	11.7612	6.5736
61	Whitefish	1000.0	37.3	40.0	43.5	12.3540	6.5250
62	Parkki	55.0	13.5	14.7	16.5	6.8475	2.3265
63	Parkki	60.0	14.3	15.5	17.4	6.5772	2.3142
64	Parkki	90.0	16.3	17.7	19.8	7.4052	2.6730
65	Parkki	120.0	17.5	19.0	21.3	8.3922	2.9181

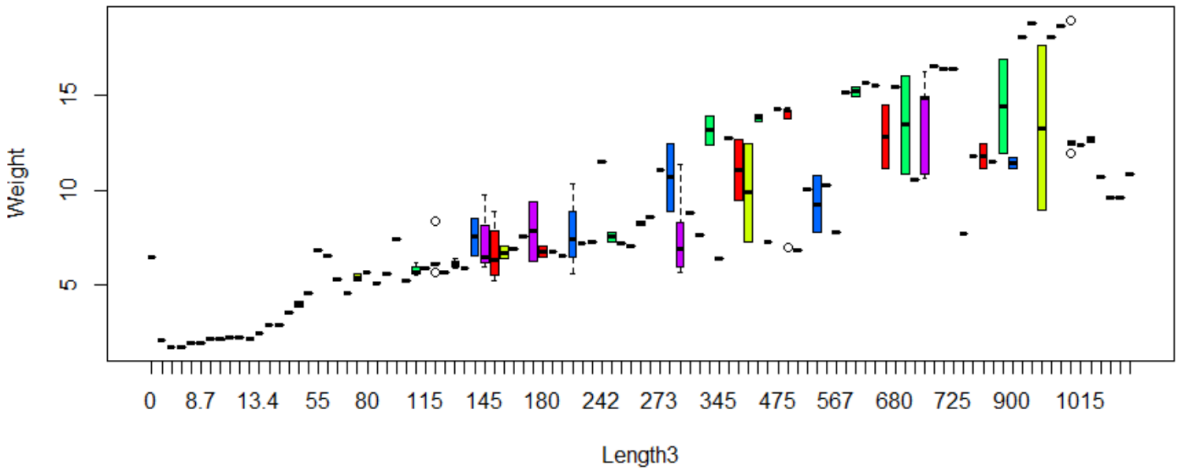
66	Parkki	150.0	18.4	20.0	22.4	8.8928	3.2928
67	Parkki	140.0	19.0	20.7	23.2	8.5376	3.2944
68	Parkki	170.0	19.0	20.7	23.2	9.3960	3.4104
69	Parkki	145.0	19.8	21.5	24.1	9.7364	3.1571
70	Parkki	200.0	21.2	23.0	25.8	10.3458	3.6636
71	Parkki	273.0	23.0	25.0	28.0	11.0880	4.1440
72	Parkki	300.0	24.0	26.0	29.0	11.3680	4.2340
73	Perch	5.9	7.5	8.4	8.8	2.1120	1.4080
74	Perch	32.0	12.5	13.7	14.7	3.5280	1.9992
75	Perch	40.0	13.8	15.0	16.0	3.8240	2.4320
76	Perch	51.5	15.0	16.2	17.2	4.5924	2.6316
77	Perch	70.0	15.7	17.4	18.5	4.5880	2.9415
78	Perch	100.0	16.2	18.0	19.2	5.2224	3.3216
79	Perch	78.0	16.8	18.7	19.4	5.1992	3.1234
80	Perch	80.0	17.2	19.0	20.2	5.6358	3.0502
81	Perch	85.0	17.8	19.6	20.8	5.1376	3.0368
82	Perch	85.0	18.2	20.0	21.0	5.0820	2.7720
83	Perch	110.0	19.0	21.0	22.5	5.6925	3.5550
84	Perch	115.0	19.0	21.0	22.5	5.9175	3.3075
85	Perch	125.0	19.0	21.0	22.5	5.6925	3.6675
86	Perch	130.0	19.3	21.3	22.8	6.3840	3.5340
87	Perch	120.0	20.0	22.0	23.5	6.1100	3.4075
88	Perch	120.0	20.0	22.0	23.5	5.6400	3.5250
89	Perch	130.0	20.0	22.0	23.5	6.1100	3.5250
90	Perch	135.0	20.0	22.0	23.5	5.8750	3.5250
91	Perch	110.0	20.0	22.0	23.5	5.5225	3.9950
92	Perch	130.0	20.5	22.5	24.0	5.8560	3.6240
93	Perch	150.0	20.5	22.5	24.0	6.7920	3.6240
94	Perch	145.0	20.7	22.7	24.2	5.9532	3.6300
95	Perch	150.0	21.0	23.0	24.5	5.2185	3.6260
96	Perch	170.0	21.5	23.5	25.0	6.2750	3.7250

97	Perch	225.0	22.0	24.0	25.5	7.2930	3.7230
98	Perch	145.0	22.0	24.0	25.5	6.3750	3.8250
99	Perch	188.0	22.6	24.6	26.2	6.7334	4.1658
100	Perch	180.0	23.0	25.0	26.5	6.4395	3.6835
101	Perch	197.0	23.5	25.6	27.0	6.5610	4.2390
102	Perch	218.0	25.0	26.5	28.0	7.1680	4.1440
103	Perch	300.0	25.2	27.3	28.7	8.3230	5.1373
104	Perch	260.0	25.4	27.5	28.9	7.1672	4.3350
105	Perch	265.0	25.4	27.5	28.9	7.0516	4.3350
106	Perch	250.0	25.4	27.5	28.9	7.2828	4.5662
107	Perch	250.0	25.9	28.0	29.4	7.8204	4.2042
108	Perch	300.0	26.9	28.7	30.1	7.5852	4.6354
109	Perch	320.0	27.8	30.0	31.6	7.6156	4.7716
110	Perch	514.0	30.5	32.8	34.0	10.0300	6.0180
111	Perch	556.0	32.0	34.5	36.5	10.2565	6.3875
112	Perch	840.0	32.5	35.0	37.3	11.4884	7.7957
113	Perch	685.0	34.0	36.5	39.0	10.8810	6.8640
114	Perch	700.0	34.0	36.0	38.3	10.6091	6.7408
115	Perch	700.0	34.5	37.0	39.4	10.8350	6.2646
116	Perch	690.0	34.6	37.0	39.3	10.5717	6.3666
117	Perch	900.0	36.5	39.0	41.4	11.1366	7.4934
118	Perch	650.0	36.5	39.0	41.4	11.1366	6.0030
119	Perch	820.0	36.6	39.0	41.3	12.4313	7.3514
120	Perch	850.0	36.9	40.0	42.3	11.9286	7.1064
121	Perch	900.0	37.0	40.0	42.5	11.7300	7.2250
122	Perch	1015.0	37.0	40.0	42.4	12.3808	7.4624
123	Perch	820.0	37.1	40.0	42.5	11.1350	6.6300
124	Perch	1100.0	39.0	42.0	44.6	12.8002	6.8684
125	Perch	1000.0	39.8	43.0	45.2	11.9328	7.2772
126	Perch	1100.0	40.1	43.0	45.5	12.5125	7.4165
127	Perch	1000.0	40.2	43.5	46.0	12.6040	8.1420

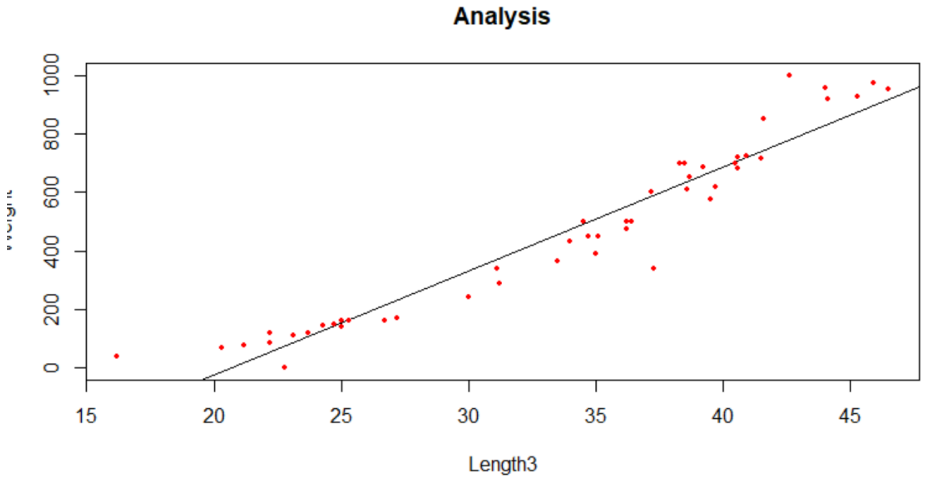
```
128     Perch 1000.0    41.1    44.0    46.6 12.4888 7.5958
129      Pike  200.0    30.0    32.3    34.8  5.5680 3.3756
130      Pike  300.0    31.7    34.0    37.8  5.7078 4.1580
131      Pike  300.0    32.7    35.0    38.8  5.9364 4.3844
132      Pike  300.0    34.8    37.3    39.8  6.2884 4.0198
133      Pike  430.0    35.5    38.0    40.5  7.2900 4.5765
134      Pike  345.0    36.0    38.5    41.0  6.3960 3.9770
135      Pike  456.0    40.0    42.5    45.5  7.2800 4.3225
136      Pike  510.0    40.0    42.5    45.5  6.8250 4.4590
137      Pike  540.0    40.1    43.0    45.8  7.7860 5.1296
138      Pike  500.0    42.0    45.0    48.0  6.9600 4.8960
139      Pike  567.0    43.2    46.0    48.7  7.7920 4.8700
140      Pike  770.0    44.8    48.0    51.2  7.6800 5.3760
141      Pike  950.0    48.3    51.7    55.1  8.9262 6.1712
142      Pike 1250.0    52.0    56.0    59.7 10.6863 6.9849
 [ reached 'max' / getOption("max.print") -- omitted 17 rows ]


head(mydata)
  ï..Species Weight Length1 Length2 Length3  Height  Width
1     Bream    242    23.2    25.4    30.0 11.5200 4.0200
2     Bream    290    24.0    26.3    31.2 12.4800 4.3056
3     Bream    340    23.9    26.5    31.1 12.3778 4.6961
4     Bream    363    26.3    29.0    33.5 12.7300 4.4555
5     Bream    430    26.5    29.0    34.0 12.4440 5.1340
6     Bream    450    26.8    29.7    34.7 13.6024 4.9274


> print(is.data.frame(data))
[1] TRUE
#Range of Weight column
> print(range(mydata$Weight))
[1]    0 1650
```

```
> #Mean of weights
> print(mean(mydata$Weight))
[1] 398.3264
> #Mode
> getmode <- function(x)
+ {
+   uniqv <- unique(x)
+   uniqv[which.max(tabulate(match(x, uniqv)))]
+ }
> print(getmode(mydata$Weight))
[1] 300
> summary(mydata$Weight)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.0   120.0   273.0   398.3   650.0  1650.0
#Correlation coefficient between Length3 and Weight
> n1<-cor(mydata$Length3,mydata$Weight,method="pearson")
> print(n1)
[1] 0.9230436
#Correlation coefficient between Length2 and weight
> n2<-cor(mydata$Length2,mydata$Weight,method="pearson")
> print(n2)
[1] 0.9186177
#Correlation coefficient between Length1 and weight
> n3<-cor(mydata$Length1,mydata$Weight,method="pearson")
> print(n3)
[1] 0.9157117
n4<-cor(mydata$Height,mydata$Weight,method="pearson")
> print(n4)
[1] 0.7243453
> barplot(set1$Weight,set1$Length3,main="Analysis",xlab="Weight",ylab="Length",names.arg =
set1$Weight,col="green")
```

boxplot(Height~Weight,data=mydata, col=rainbow(5), xlab="Length3", ylab="Weight")



set <- lm(mydata$Length3~mydata$Weight, data =mydata)
> coeffs=coefficients(set);
> print(coeffs)
(Intercept) mydata$Weight
19.3023842 0.0299369
>
> set1<-head(mydata,50)
plot(set1$Length3,set1$Weight,col="red",main="Analysis",abline(lm(set1$Weight~set1$Length3)),cex=0.5,pch=16,xlab="Length3",ylab="Weight")



set2 <- lm(mydata$Length1~mydata$Weight, data =mydata)

> coeffs=coefficients(set);

> print(coeffs)

(Intercept) mydata$Weight

19.3023842 0.0299369

>

> set3<-head(mydata,50)

#plotting the regression line

>
plot(set3$Length1,set1$Weight,col="red",main="Analysis",abline(lm(set3$Weight~set3$Length1)),cex=0.5,pch=16,xlab="Length3",ylab="Weight")