**CHALLENGING EXPERIMENT 3**

**Collect at least 60 students and analyse the data by using descriptive statistics and Interpret the results.**

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Let x be the marks of 80 students in Maths.

> x=c(1,2,3,4,5,6,7,8,9,10,11,12,13,14,115,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,64,63,64,64,65,67,65,64,78,64)

> x

[1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 115 16 17 18 19

[20] 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

[39] 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57

[58] 58 59 60 61 62 63 64 65 66 67 68 69 70 64 63 64 64 65 67

[77] 65 64 78 64

> summary(x)

Min. 1st Qu. Median Mean 3rd Qu. Max.

1.00 21.75 41.50 40.54 61.25 115.00

> mean(X)

Error in mean(X) : object 'X' not found

> mean(x)

[1] 40.5375

> median(x)

[1] 41.5

> y=table(x)

> mode=which(y==max(y))

> mode

64

63

> range=115.00-1.00

> range

[1] 114

> var(x)

[1] 529.1631

> sd=sqrt(var(x))

> sd

[1] 23.00355

> cqd=(61.25-21.75)/(61.25+21.75)

> cqd

[1] 0.4759036

> md=(x-mean(x))

> md

[1] -39.5375 -38.5375 -37.5375 -36.5375 -35.5375 -34.5375 -33.5375 -32.5375

[9] -31.5375 -30.5375 -29.5375 -28.5375 -27.5375 -26.5375 74.4625 -24.5375

[17] -23.5375 -22.5375 -21.5375 -20.5375 -19.5375 -18.5375 -17.5375 -16.5375

[25] -15.5375 -14.5375 -13.5375 -12.5375 -11.5375 -10.5375 -9.5375 -8.5375

[33] -7.5375 -6.5375 -5.5375 -4.5375 -3.5375 -2.5375 -1.5375 -0.5375

[41] 0.4625 1.4625 2.4625 3.4625 4.4625 5.4625 6.4625 7.4625

[49] 8.4625 9.4625 10.4625 11.4625 12.4625 13.4625 14.4625 15.4625

[57] 16.4625 17.4625 18.4625 19.4625 20.4625 21.4625 22.4625 23.4625

[65] 24.4625 25.4625 26.4625 27.4625 28.4625 29.4625 23.4625 22.4625

[73] 23.4625 23.4625 24.4625 26.4625 24.4625 23.4625 37.4625 23.4625

> md=abs(md)

> md

[1] 39.5375 38.5375 37.5375 36.5375 35.5375 34.5375 33.5375 32.5375 31.5375

[10] 30.5375 29.5375 28.5375 27.5375 26.5375 74.4625 24.5375 23.5375 22.5375

[19] 21.5375 20.5375 19.5375 18.5375 17.5375 16.5375 15.5375 14.5375 13.5375

[28] 12.5375 11.5375 10.5375 9.5375 8.5375 7.5375 6.5375 5.5375 4.5375

[37] 3.5375 2.5375 1.5375 0.5375 0.4625 1.4625 2.4625 3.4625 4.4625

[46] 5.4625 6.4625 7.4625 8.4625 9.4625 10.4625 11.4625 12.4625 13.4625

[55] 14.4625 15.4625 16.4625 17.4625 18.4625 19.4625 20.4625 21.4625 22.4625

[64] 23.4625 24.4625 25.4625 26.4625 27.4625 28.4625 29.4625 23.4625 22.4625

[73] 23.4625 23.4625 24.4625 26.4625 24.4625 23.4625 37.4625 23.4625

> mdl=sum(md)/length(md)

> mdl

[1] 19.39906

> z=abs(x-median(x))

> z

[1] 40.5 39.5 38.5 37.5 36.5 35.5 34.5 33.5 32.5 31.5 30.5 29.5 28.5 27.5 73.5

[16] 25.5 24.5 23.5 22.5 21.5 20.5 19.5 18.5 17.5 16.5 15.5 14.5 13.5 12.5 11.5

[31] 10.5 9.5 8.5 7.5 6.5 5.5 4.5 3.5 2.5 1.5 0.5 0.5 1.5 2.5 3.5

[46] 4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 12.5 13.5 14.5 15.5 16.5 17.5 18.5

[61] 19.5 20.5 21.5 22.5 23.5 24.5 25.5 26.5 27.5 28.5 22.5 21.5 22.5 22.5 23.5

[76] 25.5 23.5 22.5 36.5 22.5

> md2=sum(z)/length(z)

> md2

[1] 19.3875

> mean=mean(x)

> mean

[1] 40.5375

> m4=sum((x-mean)^4)/length(x)

> m4

[1] 758183.3

> m2=var(x)

> m2

[1] 529.1631

> beta2=m4/(m2^2)

> beta2

[1] 2.707666

> gam2=beta2-3

> gam2

[1] -0.2923341







