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1.  ##Logvalues
2.  logchl5<-log10(ChlValues)
3.  logtp5<- log10(TP)

4.  ##normality test Anderson-Darling & Lillie Test
5.  library(nortest)
6.  ad.test(ChlValues)
7.  ad.test(logchl5)

8.  lillie.test(logchl5)
9.  lillie.test(ChlValues)

10. ## Log Correlations:
11. cor.test(Pro1, logchl5, method = "spearman")
12. cor.test(Pro2, logchl5, method = "spearman")
13. cor.test(Pro3, logchl5, method = "spearman")
14. cor.test(Pro4, logchl5, method = "spearman")
15. cor.test(Pro5, logchl5, method = "spearman")
16. cor.test(Pro6, logchl5, method = "spearman")
17. cor.test(Pro7, logchl5, method = "spearman")
18. cor.test(Pro8, logchl5, method = "spearman")
19. cor.test(Pro9, logchl5, method = "spearman")
20. cor.test(Pro10, logchl5, method = "spearman")
21. cor.test(Pro11, logchl5, method = "spearman")
22. cor.test(Pro12, logchl5, method = "spearman")
23. cor.test(Pro13, logchl5, method = "spearman")
24. cor.test(Pro14, logchl5, method = "spearman")
25. cor.test(Pro15, logchl5, method = "spearman")
26. cor.test(Pro16, logchl5, method = "spearman")
27. cor.test(Pro17, logchl5, method = "spearman")
28. cor.test(Population, logchl5, method = "spearman")

29. ##PCA
30. library(factoextra)
31. finaldata4 <- (Global_with_Land_Use_Population_V1.3.3)
32. PCA <- prcomp(finaldata4[,c(9, 22:39)], scale = TRUE)
33. fviz_pca_var(GLuke,repel = TRUE, addEllipse=FALSE) + theme_classic()

34. ##PCA w/ names Same data previous PCA data has different titles
35. finaldata5 <- (Global_with_Names)
36. PCANames <- prcomp(finaldata5[,c(9, 22:39)], scale = TRUE)
37. fviz_pca_var(PCANamesLog,repel = TRUE, addEllipse=FALSE) + theme_classic()

38. ## Random Forest
39. library(randomForest)
40. rfmodel<-randomForest(ChlValues ~ Pro1+Pro2+Pro3+Pro4+Pro5+Pro6+Pro7+Pro8+Pro9+Pro10+Pro11+Pro12+Pro13+Pro14+Pro15+Pro16+Pro17+Population, data =
Global_with_Land_Use_Population_V1.3.3, proximity=TRUE, ntree=500, mtry= 5)
41. rfmodel$importance

42. ##BrokenStick Analysis
43. bstick <- get_eigenvalue(PCANames)
44. head(bstick)
45. bstick
46. summary(bstick)
47. bstick$eigenvalue
48. bstick$variance.percent
49. bstick$cumulative.variance.percent
50. (bstick)
51. fviz_screplot(PCANames)
52. screplot(PCANames)
53. summary(screplot(PCANames))

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