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Lab 4

**Part 1**

1) apply(PresencePBDB,1,sum)

Miocene = 602, Early Jurassic = 169, Late Cretaceous = 375, Pennsylvanian = 133

2) length(apply(PresencePBDB,1,sum)) This returns 29.

3) > PresencePBDB[,"Mytilus"]

This returns the epochs:

4) Because the epochs with no data come later in the Geologic history than samples from epochs that have records such as the Pridoli, which predates the Pennsylvanian.

**Part 2**

1) VecMiocene <- PresencePBDB["Miocene",]

> VecPleistocene <- PresencePBDB["Pleistocene",]

> Results <- VecMiocene + VecPleistocene

> table(Results)

> Results

0 1 2

287 106 510

> 510/(106+510) =.8279221

2) By turning it into a distance index or 1 - .8279221 = 0.17207792

3) > vegdist(PresencePBDB, method="jaccard", binary=FALSE, diag=FALSE, upper=FALSE,na.rm = FALSE)

0.17207792

4) > VecPleistocene <- PresencePBDB["Pleistocene",]

> VecPliocene <- PresencePBDB["Pliocene",]

> VecMiocene <- PresencePBDB["Miocene",]

> VecOligocene <- PresencePBDB["Oligocene",]

> VecEocene <- PresencePBDB["Eocene",]

> VecPaleocene <- PresencePBDB["Eocene",]

> MyData <- rbind(VecPleistocene,VecPliocene,VecMiocene,VecOligocene,VecEocene,VecPaleocene) > Result <- vegdist(MyData, method="jaccard", binary=FALSE, diag=FALSE, upper=FALSE,na.rm = FALSE)

> Result

> VecPleistocene VecPliocene VecMiocene VecOligocene VecEocene

VecPliocene 0.12692967

VecMiocene 0.17207792 0.08496732

VecOligocene 0.26910299 0.18968386 0.16065574

VecEocene 0.21870048 0.13397129 0.08585056 0.19063005

VecPaleocene 0.21870048 0.13397129 0.08585056 0.19063005 0.0000000

**Part 3**

1) > RandomEpochs <- rbind(PresencePBDB["Pliocene",],PresencePBDB["Oligocene",],PresencePBDB["Paleocene",],PresencePBDB["Early Cretaceous",],PresencePBDB["Late Jurassic",],PresencePBDB["Middle Jurassic",])

2) Data3.1 <- vegdist(RandomEpochs, method="jaccard", binary=FALSE, diag=FALSE, upper=FALSE,na.rm = FALSE)

1 2 3 4 5

2 0.1896839

3 0.3791469 0.4104235

4 0.7462908 0.7480315 0.6400742

5 0.8652695 0.8653846 0.7902622 0.4703947

6 0.8852459 0.8814103 0.7931689 0.4883721 0.2962963

3) One and six are the most dissimilar and the order of the gradient is 1,2 3, 4 5,6.

4)

5) An Asteroid hit the earth.

**Part 4**

1) > Ordovician <- downloadPBDB(Taxa=c("Animalia"),StartInterval="Ordovician",StopInterval="Ordovician")

2) > Ordovician <- cleanGenus(Ordovician)

3) > OrdoMatrix <-presenceMatrix(Ordovician,SampleDefinition="geoplate")

> OrdoMatrix <-cullMatrix(OrdoMatrix,minOccurrences=2,minDiversity=25)

4) > OrdoDCA<-decorana(OrdoMatrix)

> plot(OrdoDCA,display="sites")

They do not relate to lat and longitude. I know based on the mean found for lat/lng vs geoplate.

> tapply(Ordovician[,"paleolat"],Ordovician[,"geoplate"],mean)

> tapply(Ordovician[,"paleolng”],Ordovician[,"geoplate"],mean)