

## Lista 13

Przedstaw na wykresie 18 szeregów czasowych ze zbioru `synthetic.tseries`, każdy „prawdziwy” klaster zaznaczając innym kolorem i innym rodzajem linii

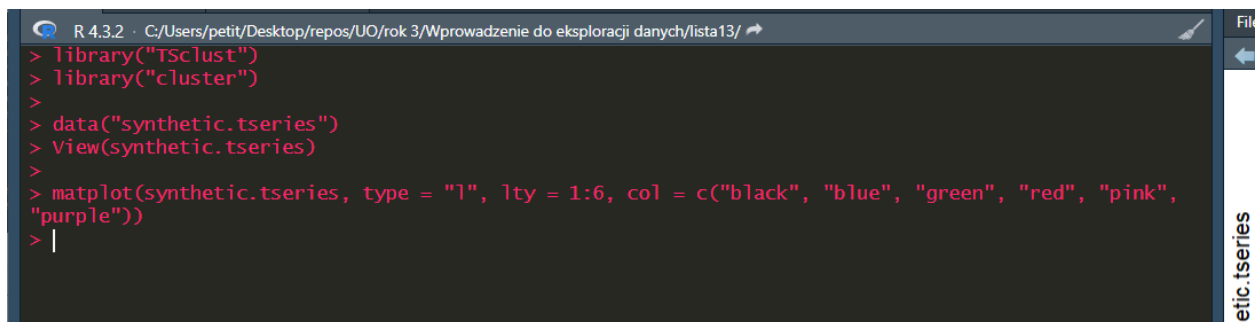
```
library("TSclust")
```

```
library("cluster")
```

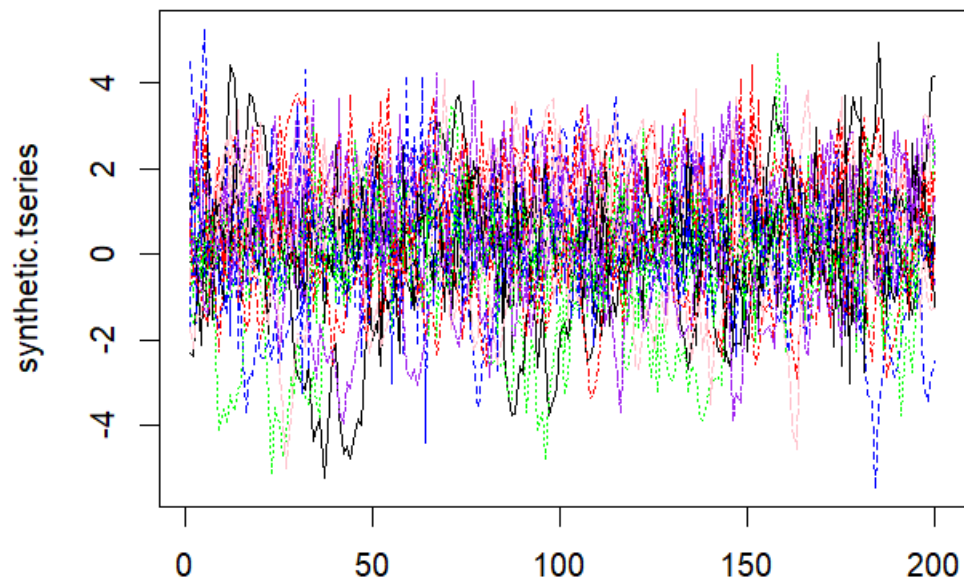
```
data("synthetic.tseries")
```

```
View(synthetic.tseries)
```

```
matplot(synthetic.tseries, type = "l", lty = 1:6, col = c("black", "blue", "green", "red", "pink", "purple"))
```



```
R 4.3.2 - C:/Users/petit/Desktop/repos/UO/rok 3/Wprowadzenie do eksploracji danych/lista13/
> library("TSclust")
> library("cluster")
> 
> data("synthetic.tseries")
> View(synthetic.tseries)
> 
> matplot(synthetic.tseries, type = "l", lty = 1:6, col = c("black", "blue", "green", "red", "pink",
"purple"))
> |
```



Wyznacz macierze odległości dla metod EUCL, FRECHET, DTW i CORT, przeprowadź grupowanie metodami hclust i pam dla 6 klastrów.

```
library("TSclust")
```

```
library("cluster")
```

```
data("synthetic.tseries")
```

```
View(synthetic.tseries)
```

```
matplot(synthetic.tseries, type = "l", lty = 1:6, col = c("black", "blue", "green", "red", "pink", "purple"))
```

```
EUCL.dis<-diss(synthetic.tseries, "EUCL")
```

```
FRECHET.dis<-diss(synthetic.tseries, "FRECHET")
```

```
DTW.dis<-diss(synthetic.tseries, "DTW")
CORT.dis<-diss(synthetic.tseries, "CORT")
```

```
EUCL.hclust <- hclust(EUCL.dis)
FRECHET.hclust <- hclust(FRECHET.dis)
DTW.hclust <- hclust(DTW.dis)
CORT.hclust <- hclust(CORT.dis)
```

```
EUCL.pam<-pam(EUCL.dis, k=6)$clustering
FRECHET.pam<-pam(FRECHET.dis, k=6)$clustering
DTW.pam<-pam(DTW.dis, k=6)$clustering
CORT.pam<-pam(CORT.dis, k=6)$clustering
```

```
EUCL.hclust <- cutree(hclust(EUCL.dis), k=6)
FRECHET.hclust <- cutree(hclust(FRECHET.dis), k=6)
DTW.hclust <- cutree(hclust(DTW.dis), k=6)
CORT.hclust <- cutree(hclust(CORT.dis), k=6)
```

```
true_cluster <- rep(1:6, each = 3)
```

```
EUCL.hclust.ce=cluster.evaluation(true_cluster, EUCL.hclust)
FRECHET.hclust.ce=cluster.evaluation(true_cluster, FRECHET.hclust)
DTW.hclust.ce=cluster.evaluation(true_cluster, DTW.hclust)
CORT.hclust.ce=cluster.evaluation(true_cluster, CORT.hclust)
```

```
EUCL.pam.ce=cluster.evaluation(true_cluster, EUCL.pam)
FRECHET.pam.ce=cluster.evaluation(true_cluster, FRECHET.pam)
DTW.pam.ce=cluster.evaluation(true_cluster, DTW.pam)
CORT.pam.ce=cluster.evaluation(true_cluster, CORT.pam)
```

```
df <- data.frame(

  Method = rep(c("EUCL.hclust", "FRECHET.hclust", "DTW.hclust", "CORT.hclust", "EUCL.pam",
"FRECHET.pam", "DTW.pam", "CORT.pam")),

  Clustering = c(EUCL.hclust.ce, FRECHET.hclust.ce, DTW.hclust.ce, CORT.hclust.ce,
EUCL.pam.ce, FRECHET.pam.ce, DTW.pam.ce, CORT.pam.ce)

)
```

```
barplot(df$Clustering, names.arg = df$Method, xlab = "Metoda", ylab = "Efektywność", main =
"Efektywność grupowania dla każdej metody",ylim=c(0,1))
```

```
R 4.3.2 · C:/Users/petit/Desktop/repos/UO/rok 3/Wprowadzenie do eksploracji danych/lista13/
> library("TSclust")
> library("cluster")
>
> data("synthetic.tseries")
> View(synthetic.tseries)
>
> matplot(synthetic.tseries, type = "l", lty = 1:6, col = c("black", "blue", "green", "red", "pink",
"purple"))
>
> EUCL.dis<-diss(synthetic.tseries, "EUCL")
> FRECHET.dis<-diss(synthetic.tseries, "FRECHET")
```

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
P1	6.805655	5.663760	5.0305565	6.0105233	7.602491	5.0998855	3.3784174	1.1681122
P2	6.880827	5.737323	5.1020052	6.0807676	7.672274	5.1652732	3.4357340	1.1744203
P3	5.528074	4.382818	3.7453791	4.7228905	6.313929	3.8059578	2.0822914	0.6080772
P4	4.787113	3.640424	3.0002953	3.9750809	5.564909	3.0539210	1.3310098	1.1637166
P5	5.348249	4.201217	3.5598177	4.5317510	6.119577	3.6043192	1.8630928	0.6153306

	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
P1	1.0181170	1.5204580	1.3802096	3.0616619	2.8500697	2.3802560	1.544439	2.057454
P2	0.9929080	1.5263676	1.3646106	3.0975368	2.8780799	2.3912415	1.489273	1.933646
P3	0.8856698	0.7022144	0.8653506	1.8149039	1.6432387	1.3107000	1.354884	2.987147
P4	1.4849298	1.0019806	1.2841999	1.1522616	1.0585125	1.0005797	1.761489	3.639691
P5	0.9327718	0.5576410	0.7946855	1.5517096	1.3704755	1.0401797	1.293365	3.083496

	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24
P1	1.659116	1.770823	1.855815	1.900922	2.0022684	2.1209128	2.2034885	2.4515026
P2	1.543650	1.654550	1.779564	1.800065	1.9001142	2.0342197	2.1005832	2.3857356
P3	2.217854	2.325450	1.802233	2.164869	2.2659884	2.1397299	2.4442634	2.1441254
P4	2.788466	2.886053	2.175804	2.620862	2.7100483	2.4071641	2.8706518	2.3210012

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P1	1.659116	1.770823	1.855815	1.900922	2.0022684	2.1209128	2.2034885	2.4515026	
P2	1.543650	1.654550	1.779564	1.800065	1.9001142	2.0342197	2.1005832	2.3857356	
P3	2.217854	2.325450	1.802233	2.164869	2.2659884	2.1397299	2.4442634	2.1441254	
P4	2.788466	2.886053	2.175894	2.629862	2.7199483	2.4971641	2.8706518	2.3219012	
P5	2.256801	2.358758	1.732560	2.143766	2.2399951	2.0667081	2.4058796	1.9998239	
	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	
P1	2.4405619	2.5249334	2.6228436	2.8240372	2.9001125	3.0131339	3.1820379	4.4399013	
P2	2.3293583	2.4379361	2.5350107	2.7520855	2.8246539	2.9387580	3.1142987	4.4251006	
P3	2.7952155	2.4798734	2.5759857	2.5407889	2.6526307	2.7394594	2.8086584	3.4654962	
P4	3.2428567	2.7644605	2.8497267	2.6833671	2.8052356	2.8677866	2.8679816	3.0271626	
P5	2.7693141	2.3792584	2.4718556	2.3886274	2.5048043	2.5842479	2.6323706	3.1938623	
	Q33	Q34	Q35	Q36	Q37	Q38	Q39	Q40	
P1	4.8171347	3.6641723	4.5085615	4.477925	4.594133	4.732195	4.593538	4.793243	
P2	4.8079557	3.6081596	4.4836957	4.447834	4.563613	4.701964	4.554162	4.756639	
P3	3.7920860	3.1155943	3.6140703	3.629884	3.746213	3.877571	3.827400	3.994527	
P4	3.2990042	3.0314336	3.2373533	3.290222	3.401848	3.522860	3.543396	3.679070	
P5	3.5170411	2.9024878	3.3489966	3.369641	3.485574	3.615789	3.576117	3.738607	
	Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49
P1	5.054170	5.446722	5.045246	5.240597	5.217969	5.296440	5.862783	6.544968	7.124534
P2	5.021969	5.421826	5.004625	5.202444	5.174975	5.252020	5.831721	6.526127	7.113257
P3	4.208293	4.529948	4.277024	4.444019	4.467832	4.558104	4.989963	5.564778	6.085205
P4	3.849254	4.106870	3.974802	4.115388	4.172958	4.269156	4.590443	5.073972	5.543259
P5	3.946501	4.260966	4.023741	4.186921	4.216097	4.307517	4.724015	5.290705	5.808876
	Q50	Q51	Q52	Q53	Q54	Q55	Q56	Q57	
P1	7.028105	6.216541	6.1789307	6.2271199	6.695178	6.714775	6.809912	7.6378175	
P2	7.012843	6.181499	6.1395543	6.1856817	6.662586	6.679669	6.774093	7.6161094	
P3	6.017113	5.372285	5.3741874	5.4405774	5.822746	5.863710	5.963795	6.6685054	
P4	5.497461	4.986543	5.0172718	5.0955231	5.408857	5.464762	5.566927	6.1735748	
P5	5.741569	5.108368	5.1141435	5.1823118	5.555771	5.598527	5.698935	6.3944847	
	Q58	Q59	Q60	Q61	Q62	Q63	Q64	Q65	
P1	7.4230154	7.4283824	7.3864558	7.7782222	7.6406407	7.2644174	7.05505229	8.3398585	
P2	7.3949103	7.3978001	7.3523437	7.7494045	7.6065752	7.2187926	7.00015072	8.3117354	
P3	6.5052374	6.5306732	6.5187212	6.8628557	6.7698751	6.5017440	6.38735860	7.4143699	

Nie będę wklejać dalszej części wyników z konsoli bo wydaje mi się, że jest to bez zasadne.

Sporządź wykres słupkowy przedstawiający jakość grupowania dla wszystkich 8 wersji grupowania (na wykresie powinny być dwie serie – każda seria dla jednej metody grupowania).

```
EUCL.hclust <- cutree(hclust(EUCL.dis), k=6)
```

```
FRECHET.hclust <- cutree(hclust(FRECHET.dis), k=6)
```

```
DTW.hclust <- cutree(hclust(DTW.dis), k=6)
```

```
CORT.hclust <- cutree(hclust(CORT.dis), k=6)
```

```
true_cluster <- rep(1:6, each = 3)
```

```
EUCL.hclust.ce=cluster.evaluation(true_cluster, EUCL.hclust)
```

```
FRECHET.hclust.ce=cluster.evaluation(true_cluster, FRECHET.hclust)
```

```
DTW.hclust.ce=cluster.evaluation(true_cluster, DTW.hclust)
```

```
CORT.hclust.ce=cluster.evaluation(true_cluster, CORT.hclust)
```

```
EUCL.pam.ce=cluster.evaluation(true_cluster, EUCL.pam)
```

```
FRECHET.pam.ce=cluster.evaluation(true_cluster, FRECHET.pam)
```

```
DTW.pam.ce=cluster.evaluation(true_cluster, DTW.pam)
```

```
CORT.pam.ce=cluster.evaluation(true_cluster, CORT.pam)
```

```
df <- data.frame(
```

```
  Method = rep(c("EUCL.hclust", "FRECHET.hclust", "DTW.hclust", "CORT.hclust", "EUCL.pam",  
"FRECHET.pam", "DTW.pam", "CORT.pam")),
```

```
  Clustering = c(EUCL.hclust.ce, FRECHET.hclust.ce, DTW.hclust.ce, CORT.hclust.ce,  
EUCL.pam.ce, FRECHET.pam.ce, DTW.pam.ce, CORT.pam.ce)
```

```
)
```

```
barplot(df$Clustering, names.arg = df$Method, xlab = "Metoda", ylab = "Efektywność", main =  
"Efektywność grupowania dla każdej metody",ylim=c(0,1))
```

