# IBM HR Analytics Employee Attrition & Performance

Wpływ różnych czynników na wysokość dochodu.

# Correlation Matrix

Age	1.00	-0.00	0.21	0.01	0.03	0.51	-0.00	0.50	0.30	0.00	0.05	0.68	-0.02	-0.02	0.31	0.21	0.22	0.20	-0.04	0.03
DistanceFromHome	-0.00	1.00	0.02	-0.02	0.01	0.01	-0.00	-0.02	-0.03	0.03	0.01	0.00	-0.04	-0.03	0.01	0.02	0.01	0.01	-0.00	0.03
Education	0.21	0.02	1.00	-0.03	0.04	0.10	-0.01	0.09		-0.02	-0.01	0.15	-0.03	0.01	0.07	0.06	0.05		-0.02	-0.02
EnvironmentSatisfaction	0.01	-0.02	-0.03	1.00	-0.01	0.00	-0.01	-0.01	0.01	-0.03	0.01	-0.00	-0.02	0.03	0.00	0.02	0.02	-0.00	0.00	0.07
Joblnvolvement	0.03	0.01	0.04	-0.01	1.00	-0.01	-0.02	-0.02	0.02	-0.03	0.03	-0.01	-0.02	-0.01	-0.02	0.01	-0.02	0.03	0.02	-0.00
JobLevel	0.51	0.01	0.10	0.00	-0.01	1.00	-0.00	0.95	0.14	-0.02	0.02	0.78	-0.02	0.04	0.53	0.39	0.35	0.38	-0.04	0.00
JobSatisfaction	-0.00	-0.00	-0.01	-0.01	-0.02	-0.00	1.00	-0.01	-0.06	0.00	-0.01	-0.02	-0.01	-0.02	-0.00	-0.00	-0.02	-0.03	0.03	0.02
MonthlyIncome	0.50	-0.02	0.09	-0.01		0.95	-0.01	1.00	0.15	-0.02	0.03		-0.02	0.03	0.51	0.36	0.34	0.34	-0.03	0.01
NumCompaniesWorked	0.30	-0.03	0.13	0.01		0.14	-0.06	0.15	1.00	-0.01	0.05	0.24	-0.07	-0.01	-0.12	-0.09	-0.04	-0.11	-0.04	-0.02
PerformanceRating	0.00	0.03	-0.02	-0.03	-0.03	-0.02	0.00	-0.02	-0.01	1.00	-0.03	0.01	-0.02	0.00	0.00	0.03	0.02	0.02	-0.01	0.00
RelationshipSatisfaction	0.05	0.01	-0.01	0.01		0.02	-0.01	0.03	0.05	-0.03	1.00	0.02	0.00	0.02	0.02	-0.02	0.03	-0.00	0.02	0.05
TotalWorkingYears	0.68	0.00	0.15	-0.00	-0.01	0.78	-0.02	0.77	0.24	0.01	0.02	1.00	-0.04	0.00	0.63	0.46	0.40	0.46	-0.05	0.01
TrainingTimesLastYear	-0.02	-0.04	-0.03	-0.02	-0.02	-0.02	-0.01	-0.02	-0.07	-0.02	0.00	-0.04	1.00	0.03	0.00	-0.01	-0.00	-0.00	-0.04	-0.08
WorkLifeBalance	-0.02	-0.03	0.01	0.03	-0.01	0.04	-0.02	0.03	-0.01	0.00	0.02	0.00	0.03	1.00	0.01	0.05	0.01	0.00	-0.00	-0.03
YearsAtCompany	0.31	0.01	0.07	0.00	-0.02	0.53	-0.00	0.51	-0.12	0.00	0.02	0.63	0.00	0.01	1.00	0.76	0.62	0.77	-0.03	-0.01
YearsInCurrentRole	0.21	0.02	0.06	0.02	0.01	0.39	-0.00	0.36	-0.09	0.03	-0.02	0.46	-0.01	0.05	0.76	1.00	0.55	0.71	-0.04	-0.03
YearsSinceLastPromotion	0.22	0.01	0.05	0.02	-0.02	0.35	-0.02	0.34	-0.04	0.02	0.03	0.40	-0.00	0.01	0.62	0.55	1.00	0.51	-0.03	-0.01
YearsWithCurrManager	0.20	0.01	0.07	-0.00	0.03	0.38	-0.03	0.34	-0.11	0.02	-0.00	0.46	-0.00	0.00		0.71	0.51	1.00	-0.03	-0.04
GenderNumeric	-0.04	-0.00	-0.02	0.00	0.02	-0.04	0.03	-0.03	-0.04	-0.01	0.02	-0.05	-0.04	-0.00	-0.03	-0.04	-0.03	-0.03	1.00	-0.04
OverTimeNumeric	0.03	0.03	-0.02	0.07	-0.00	0.00	0.02		-0.02	0.00	0.05	0.01	-0.08	-0.03	-0.01	-0.03	-0.01	-0.04	-0.04	1.00
	Age	DistanceFromHome	Education	EnvironmentSatisfaction	Jobinvolvement	JobLevel	JobSatisfaction	MonthlyIncome	NumCompaniesWorked	PerformanceRating	RelationshipSatisfaction	TotalWorkingYears	TrainingTimesLastYear	WorkLifeBalance	YearsAtCompany	YearsInCurrentRole	YearsSinceLastPromotion	YearsWithCurrManager	GenderNumeric	OverTimeNumeric

1.0

- 0.8

- 0.6

- 0.4

- 0.2

- 0.0

## Analiza czynnikowa ///

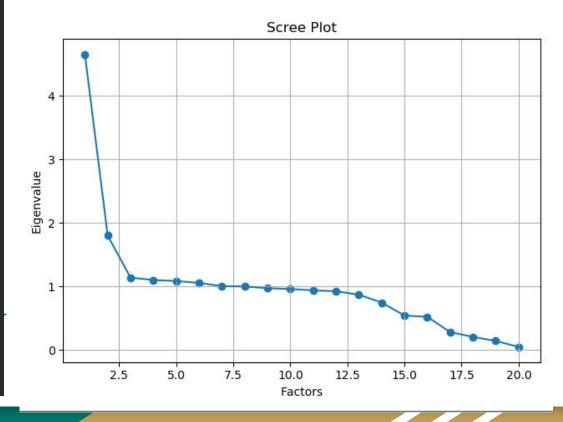
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----Test Bartletta----

chi_square_value = 10567.214703476602 , p_value = 0.0

----Test Kaiser-Meyer-Olkin----

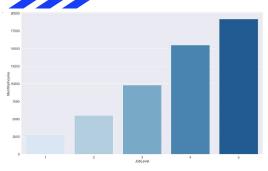
KMO = 0.8198628222373261
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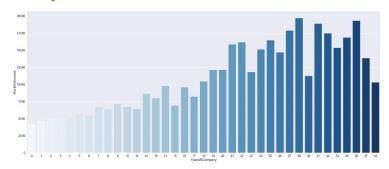
Original	_Eigenvalues
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1	1.800166
2	1.139421
3	1.101524
4	1.085140
5	1.056161
6	1.004470
7	1.000584
8	0.972924
9	0.959798
10	0.938640
11	0.925091
12	0.870793
13	0.746673
14	0.541979
15	0.521812
16	0.281792
17	0.205889
18	0.142394
19	0.048519

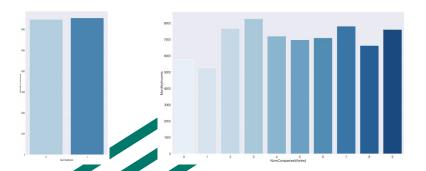


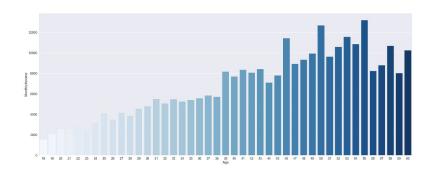
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	Factor1	Factor2	Factor3	. Factor	Factor7	Factor8
SS Loadings	2.984630	0.974824 0	.998401	. 0.263258	0.164978	0.195116
Proportion Var	0.149231	0.048741 0	.049920	. 0.013163	0.008249	0.009756
Cumulative Var	0.149231	0.197973 0	.247893	. 0.434933	0.443182	0.452938
	Factor1	Factor2	Factor3	. Factor	Factor6	Factor7
SS Loadings	2.971494	2.316085 0	.946920	. 0.367032	0.176916	0.211510
Proportion Var	0.148575	0.115804 0	.047346	. 0.018352	0.008846	0.010575
Cumulative Var	0.148575	0.264379 0	.311725	. 0.389628	0.398474	0.409049
	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
SS Loadings	2.973627	2.324698	0.926335	1.157027	0.506054	0.210655
Proportion Var	0.148681	0.116235	0.046317	0.057851	0.025303	0.010533
Cumulative Var	0.148681	0.264916	0.311233	0.369084	0.394387	0.404920
	Factor1	Factor2	Factor3	Factor4	Factor5	
					And the Control of th	
SS Loadings	2.833338	2.851374	1.016202	0.935799	0.739217	
Proportion Var	0.141667	0.142569	0.050810	0.046790	0.036961	
Cumulative Var	0.141667	0.284236	0.335046	0.381836	0.418796	
	Factor1	Factor2	Factor3	Factor4		
SS Loadings	2.774045	2.824136	1.015876	0.806733	**	
Proportion Var	0.138702	0.141207	0.050794	0.040337		
Cumulative Var	0.138702	0.279909	0.330703	0.371039	N .	

Age	0.56	0.14	0.08	0.03	0.74
DistanceFromHome	-0.01	0.02	0.02	-0.03	0.01
Education	0.10	0.05	0.01	0.08	0.19
EnvironmentSatisfaction	-0.01	0.01	0.07	-0.00	-0.00
Jobinvolvement	-0.02	0.00	-0.00	0.01	0.06
JabLevel	0.92	0.27	0.06	0.05	-0.07
JobSatisfaction	0.00	-0.02	0.00	-0.07	-0.01
Monthlyincome	0.94	0.24	0.06	0.06	-0.10
NumCompaniesWorked	0.16	-0.18	0.29	0.89	0.25
PerformanceRating	-0.03	0.03	0.00	-0.01	0.01
RelationshipSatisfaction	0.02	-0.00	0.06	0.02	0.04
TotalWorkingYears	0.73	0.42	0.10	0.11	0.27
TrainingTimesLastYear	-0.01	0.00	-0.10	-0.03	-0.02
WorkLifeBalance	0.02	0.02	-0.02	0.02	-0.05
YearsAtCompany	0.33	0.87	0.03	-0.03	0.01
YearsInCurrentRole	0.17	0.82	0.02	0.03	-0.01
earsSinceLastPromotion	0.20	0.61	0.04	0.03	0.01
YearsWithCurrManager	0.16	0.82	0.00	0.01	0.00
CenderNumeric	-0.03	-0.03	-0.05	-0.02	-0.02
OverTimeNumeric	-0.03	-0.04	0.94	-0.33	-0.02
	Factor1	Factor2	Factor3	Factor4	Factor5

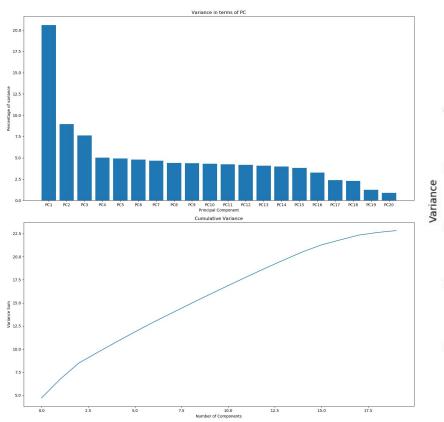


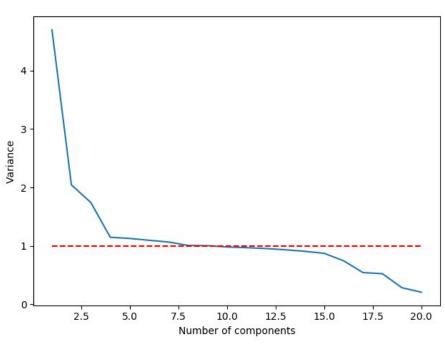




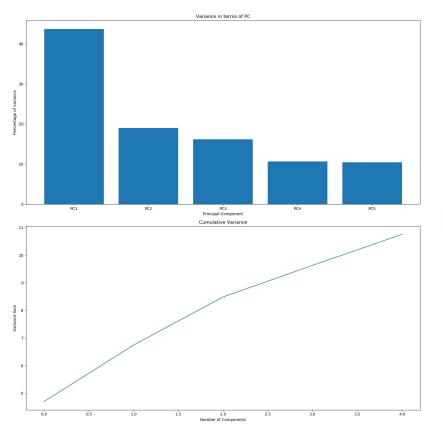


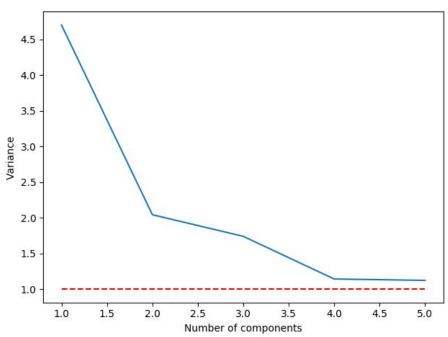
#### PCA - Principal Component Analysis (20 komponentów)



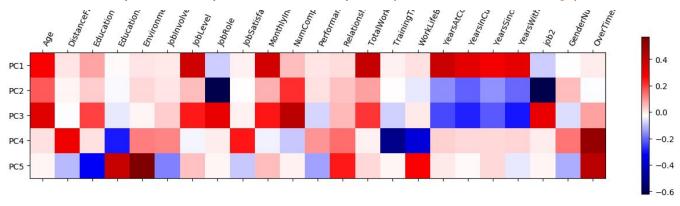


#### PCA - Principal Component Analysis (redukcja do 5 komponentów)



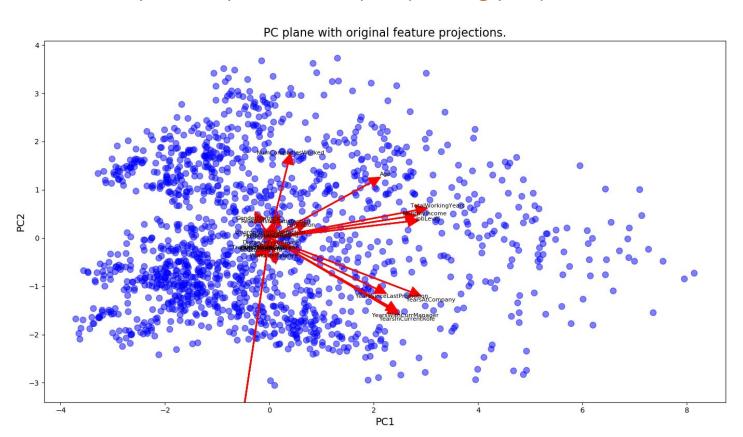


#### PCA - Principal Component Analysis (macierz korelacji)



	Age	DistanceFromHome	Education	EducationField	EnvironmentSatisfaction	Joblnvolvement	JobLevel	JobSatisfaction	MonthlyIncome	NumCompaniesWorked	PerformanceRating	RelationshipSatisfaction	TotalWorkingYears	TrainingTimesLastYear	WorkLifeBalance	YearsAtCompany	YearsInCurrentRole	YearsSinceLastPromotion	YearsWithCurrManager	job2	GenderNumeric	OverTimeNumeric
PC1	0,278166	0,004087	0,076809	-0,01953	0,00278	-0,00143	0,380187	-0,00998	0,372611	0,05109	0,004363	0,016052	0,402948	-0,0114	0,010851	0,387557	0,330745	0,293587	0,325773	-0,0858	-0,02563	-0,00628
PC2	0,166513	-0,01375	0,032779	-0,02971	0,014471	0,002299	0,047925	-0,02282	0,061126	0,220364	0,007277	0,040275	0,082961	-0,02431	-0,04753	-0,15938	-0,2094	-0,15212	-0,20019	-0,61956	0,051239	-0,02417
PC3	0,339187	-0,03159	0,196088	-0,0468	-0,01224	0,032752	0,239291	-0,0083	0,247787	0,427358	-0,07242	0,052384	0,206968	-0,07745	4,33E-05	-0,23774	-0,28252	-0,22178	-0,29591	0,315444	-0,06363	0,088094
PC4	0,008367	0,348314	0,046421	-0,32824	0,046939	0,12503	-0,05118	0,213223	-0,05543	-0,06923	0,127544	0,124416	-0,0137	-0,56462	-0,37269	0,026756	0,022379	0,033435	0,030207	-0,00471	0,110356	0,435694
PC5	-0,04038	-0,06447	-0,2945	0,342159	0,596379	-0,0686	0,042014	-0,1224	0,046236	-0,01133	-0,16052	0,346487	0,001695	-0,06635	0,227996	0,00298	-0,01354	0,040535	-0,04328	-0,01498	-0,08445	0,444442

#### PCA - Principal Component Analysis (loading plot)

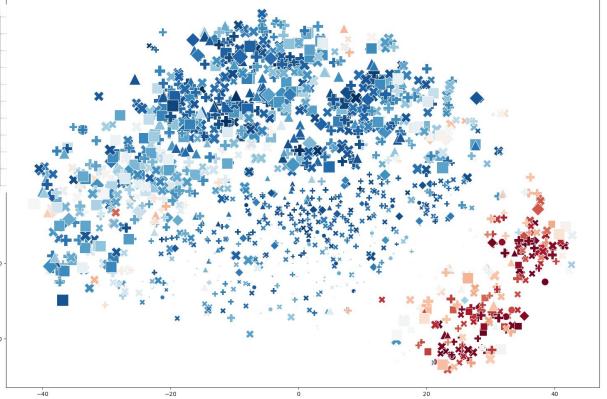


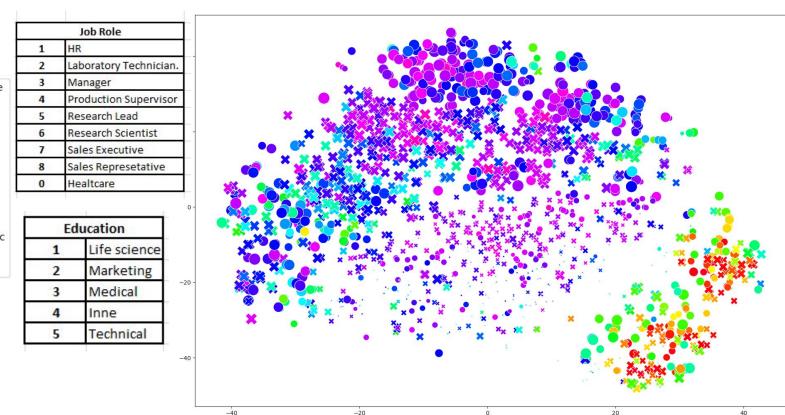


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	Job Role
1	HR
2	Laboratory Technician.
3	Manager
4	Production Supervisor
5	Research Lead
6	Research Scientist
7	Sales Executive
8	Sales Represetative
0	Healtcare

Ec	Education								
1	Life science								
2	Marketing								
3	Medical								
4	Inne								
5	Technical								





MonthlyIncome

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24000 JobRole

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GenderNumeric

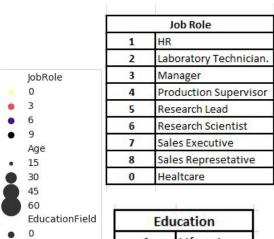
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1	Life science
2	Marketing
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	E	ducation
	1	Life science
132	2	Marketing
	3	Medical
	4	Inne
Г	5	Technical

