Dataset Sports and daily

Praposes data

Dataset terdiri dari data sensor gerak dari 19 aktivitas harian dan olahraga yang masing-masing dilakukan oleh 8 subjek dengan gayanya masing-masing selama 5 menit. Lima unit Xsens MTx digunakan pada batang tubuh, lengan, dan kaki.

Masing-masing dari 19 kegiatan dilakukan oleh delapan subjek (4 perempuan, 4 laki-laki, antara usia 20 dan 30) selama 5 menit. Durasi sinyal total adalah 5 menit untuk setiap aktivitas setiap mata pelajaran. Subyek diminta untuk melakukan kegiatan dengan gaya mereka sendiri dan tidak dibatasi pada bagaimana kegiatan harus dilakukan. Untuk alasan ini, ada variasi antar subjek dalam kecepatan dan amplitudo beberapa aktivitas. Kegiatan dilaksanakan di Gedung Olah Raga Bilkent University, di Gedung Teknik Elektro dan Elektronika, dan di area outdoor yang datar di kampus. Unit sensor dikalibrasi untuk memperoleh data pada frekuensi sampling 25 Hz. Sinyal 5 menit dibagi menjadi segmen 5 detik sehingga diperoleh 480 (= 60x8) segmen sinyal untuk setiap aktivitas.

Ke-19 kegiatan tersebut adalah: duduk (A1), berdiri (A2), berbaring telentang dan miring ke kanan (A3 dan A4), naik dan turun tangga (A5 dan A6), berdiri di lift diam (A7) dan bergerak di dalam lift (A8), berjalan di tempat parkir (A9), berjalan di atas treadmill dengan kecepatan 4 km/jam (dalam posisi datar dan miring 15 derajat) (A10 dan A11), berlari di atas treadmill dengan kecepatan 8 km/jam (A12), berolahraga di atas stepper (A13), berolahraga dengan pelatih silang (A14), bersepeda dengan sepeda olahraga dalam posisi horizontal dan vertikal (A15 dan A16), mendayung (A17), melompat (A18), dan bermain basket (A19). Maka melakukan kombinasi data yang menjadi langkah pertama dalam praposes, datanya yaitu data A1 sampai data A19

Data A1

```
# Combining the data for activity 1
data_a1 = []
d1_p1 = data_a1.append(data1_a1_p1)
d1_p2 = data_a1.append(data1_a1_p2)
d1_p3 = data_a1.append(data1_a1_p3)
d1_p4 = data_a1.append(data1_a1_p4)
d1_p5 = data_a1.append(data1_a1_p5)
d1_p6 = data_a1.append(data1_a1_p6)
d1_p7 = data_a1.append(data1_a1_p7)
d1_p8 = data_a1.append(data1_a1_p8)
s = 1
for d in data_a1:
    d.columns = ["T_xacc", "T_yacc", "T_zacc", "T_xgyro", "T_ygyro", "T_zgyro","T_xmag", "T_ymag", "T_zmag",
                 "RA_xacc", "RA_yacc", "RA_zacc", "RA_xgyro", "RA_ygyro", "RA_zgyro", "RA_xmag", "RA_ymag", "RA_zmag",
                 "LA_xacc", "LA_yacc", "LA_zacc", "LA_xgyro", "LA_ygyro", "LA_zgyro", "LA_xmag", "LA_ymag", "LA_zmag",
                 "RL_xacc", "RL_yacc", "RL_zacc", "RL_xgyro", "RL_ygyro", "RL_zgyro", "RL_xmag", "RL_ymag", "RL_zmag",
                 "LL_xacc", "LL_yacc", "LL_zacc", "LL_xgyro", "LL_ygyro", "LL_zgyro", "LL_xmag", "LL_ymag", "LL_zmag"]

    d.insert(45, 'Subject', s)
    d.insert(46, 'Activity', 1)
    s+=1

d1_A1 = pd.concat([d for d in data_a1], ignore_index=True)

d1_A1.head()
```

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	8.1305	1.0349	5.4217	-0.009461	0.001915	-0.003424	-0.78712	-0.069654	0.15730	0.70097	...	-9.0812	2.6220	-0.000232	-0.012092	-0.004457	0.74017	0.30053	-0.057730	1	1
1	8.1305	1.0202	5.3843	-0.009368	0.023485	0.001953	-0.78717	-0.068275	0.15890	0.71829	...	-9.0737	2.6218	-0.014784	-0.016477	0.002789	0.73937	0.30183	-0.057514	1	1
2	8.1604	1.0201	5.3622	0.015046	0.014330	0.000204	-0.78664	-0.068277	0.15879	0.69849	...	-9.0886	2.6366	-0.012770	0.005717	-0.007918	0.73955	0.30052	-0.057219	1	1
3	8.1603	1.0052	5.3770	0.006892	0.018045	0.005649	-0.78529	-0.069849	0.15912	0.72799	...	-9.0811	2.6070	-0.005725	0.009620	0.006555	0.74029	0.30184	-0.057750	1	1
4	8.1605	1.0275	5.3473	0.008811	0.030433	-0.005346	-0.78742	-0.068796	0.15916	0.71572	...	-9.0737	2.6218	-0.003929	-0.008371	0.002816	0.73845	0.30090	-0.057527	1	1

Data A2

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	8.4150	0.59607	4.9522	-0.014175	0.020415	-0.007553	-0.67835	-0.54797	-0.11053	8.8929	...	0.74253	-0.73913	0.004529	0.006630	-0.008446	0.40834	-0.039427	0.64394	1	2
1	8.4074	0.58114	4.9968	-0.012419	0.016024	-0.000235	-0.67840	-0.54858	-0.11146	8.8732	...	0.75763	-0.75441	0.004510	-0.000533	-0.008484	0.40895	-0.040697	0.64136	1	2
2	8.4148	0.62520	5.0792	0.011207	0.037455	0.004271	-0.67821	-0.54893	-0.11277	8.9075	...	0.78011	-0.75460	-0.013637	0.000449	-0.001191	0.40836	-0.039415	0.64250	1	2
3	8.3850	0.58120	5.0265	-0.006789	0.042666	-0.016759	-0.67764	-0.54895	-0.11209	8.8706	...	0.79495	-0.77634	-0.013638	-0.002250	-0.001227	0.40910	-0.039676	0.64357	1	2
4	8.4000	0.61065	5.0417	-0.001427	0.031929	-0.013054	-0.67704	-0.54919	-0.11312	8.8610	...	0.77998	-0.74675	-0.013554	-0.004187	-0.008469	0.40885	-0.039406	0.64199	1	2

5 rows × 47 columns

Data A3

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	-4.8676	-0.48347	8.5751	0.008670	0.017324	0.000229	0.19523	0.53238	-0.72827	-0.60784	...	-9.7828	0.95060	0.004004	0.002933	-0.000466	0.14388	0.56498	-0.53191	1	3
1	-4.8527	-0.47624	8.5902	-0.000332	0.027230	-0.001647	0.19587	0.53077	-0.72635	-0.60314	...	-9.8125	0.94989	0.014034	0.001022	-0.008625	0.14330	0.56683	-0.53223	1	3
2	-4.8228	-0.46167	8.5905	-0.011188	0.019980	-0.014395	0.19529	0.53196	-0.72705	-0.61312	...	-9.7676	0.97939	-0.008470	0.008042	-0.012129	0.14461	0.56632	-0.53258	1	3
3	-4.8381	-0.49159	8.6946	0.004205	0.027159	-0.007106	0.19453	0.53272	-0.72628	-0.60561	...	-9.7825	0.94972	-0.001368	0.006458	-0.003119	0.14381	0.56790	-0.53237	1	3
4	-4.8229	-0.49118	8.5604	0.008713	0.024477	-0.001622	0.19503	0.53299	-0.72693	-0.60825	...	-9.7975	0.94993	-0.001401	0.002905	-0.001340	0.14356	0.56789	-0.53211	1	3

5 rows × 47 columns

Data A4

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	2.2397	-7.7471	5.6405	-0.011793	-0.022100	-0.015429	-0.18545	0.28455	-0.83500	3.8232	...	-4.8111	8.4057	0.004347	-0.010796	0.012056	0.15756	0.54742	-0.37970	1	4
1	2.2395	-7.7990	5.6409	-0.022672	-0.021980	-0.019060	-0.18479	0.28664	-0.83488	3.8500	...	-4.8111	8.4055	0.005289	0.000061	0.006561	0.15835	0.54661	-0.37982	1	4
2	2.2469	-7.7918	5.6035	-0.002638	-0.012470	-0.001721	-0.18459	0.28661	-0.83597	3.8526	...	-4.8110	8.4205	0.004306	0.001750	0.011976	0.15899	0.54821	-0.37883	1	4
3	2.2770	-7.7622	5.6553	0.010064	-0.004426	-0.007177	-0.18413	0.28534	-0.83451	3.8476	...	-4.7962	8.4276	0.016966	0.008941	0.008290	0.15900	0.54821	-0.37869	1	4
4	2.1877	-7.7317	5.6856	0.025320	-0.026863	-0.015493	-0.18365	0.28503	-0.83575	3.8501	...	-4.8110	8.4279	0.008132	-0.006037	-0.002450	0.15755	0.54942	-0.38020	1	4

5 rows × 47 columns

Data A5

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	6.0793	-0.56808	1.6164	-0.160450	-0.181370	-0.15781	-0.59826	0.53289	-0.42936	-1.00050	...	-3.5035	-0.99854	0.34212	-0.014742	0.42144	0.56175	0.55756	-0.48109	1	5
1	6.8826	-0.56219	2.2417	0.039399	0.083757	-0.23243	-0.60381	0.52733	-0.42782	-1.27060	...	-1.7782	-0.56290	0.54072	0.360140	0.55087	0.57627	0.53953	-0.48481	1	5
2	8.3766	-0.56572	3.8419	0.055221	-0.097672	-0.17395	-0.60620	0.52102	-0.42840	-1.08050	...	2.9345	1.62920	-0.23962	0.363960	0.93217	0.60279	0.52199	-0.47212	1	5
3	10.2610	-0.64111	4.0944	0.091911	0.033779	-0.14873	-0.60885	0.51650	-0.42899	-0.22617	...	-12.2190	-6.63400	-1.21220	0.471080	0.94356	0.63044	0.51023	-0.44794	1	5
4	12.8570	-0.74633	2.9646	0.128110	-0.124260	-0.10585	-0.61434	0.51014	-0.42626	0.68298	...	-8.5603	3.03310	0.22000	0.438810	0.55007	0.65792	0.49746	-0.42453	1	5

5 rows × 47 columns

Data A6

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	7.6052	1.4873	2.8847	-0.270010	-0.044895	-0.091116	-0.46592	-0.62931	0.24728	7.7038	...	-3.31490	-0.93702	0.10462	-0.013096	0.085006	0.33216	-0.44939	0.58695	1	6
1	7.8004	1.6424	2.5962	-0.122040	-0.101480	-0.017702	-0.46410	-0.63434	0.24422	8.0664	...	-3.97190	-0.93210	-0.10984	-0.177350	0.022978	0.33380	-0.45447	0.58542	1	6
2	8.0402	1.9000	2.5176	-0.002349	-0.022593	0.044166	-0.46355	-0.63207	0.24475	8.3263	...	-0.50693	-0.95735	-0.22485	0.188040	-0.404140	0.33913	-0.45593	0.58381	1	6
3	8.2623	1.8224	2.9739	0.000418	0.048287	0.107750	-0.46605	-0.63382	0.24467	8.3117	...	1.43770	-0.61505	-0.28375	0.012627	-0.172420	0.34388	-0.45920	0.58286	1	6
4	7.6193	1.6328	3.5049	-0.150820	0.277720	0.164880	-0.47169	-0.62869	0.24521	7.6385	...	-2.83060	-0.17424	0.23367	-0.335030	0.071087	0.34767	-0.45595	0.58047	1	6

5 rows × 47 columns

Data A7

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	8.8837	0.41748	3.7903	0.125400	0.013077	0.060497	-0.27524	-0.22864	-0.38474	7.8552	...	-0.39704	-0.58651	-0.079045	0.027640	-0.020857	0.26589	0.25533	-0.15463	1	7
1	8.9684	0.53490	3.8515	0.164770	0.094286	0.050187	-0.28562	-0.23308	-0.38303	7.8743	...	-0.38949	-0.58674	-0.031418	0.031736	-0.004660	0.26509	0.25957	-0.14524	1	7
2	9.0703	0.65191	4.0617	0.119260	0.048881	0.043047	-0.29134	-0.23537	-0.37883	7.8941	...	-0.31450	-0.57287	-0.005334	0.013068	-0.003009	0.26585	0.26256	-0.13591	1	7
3	8.9960	0.63076	3.9417	0.099291	0.032765	0.037603	-0.29830	-0.23725	-0.37584	7.8170	...	-0.33041	-0.58507	0.007102	0.009745	0.005973	0.26746	0.26473	-0.12798	1	7
4	8.9294	0.65405	3.8071	0.115680	0.047860	0.039372	-0.30490	-0.23999	-0.37361	7.8033	...	-0.30802	-0.59970	0.010608	0.006317	0.013170	0.26877	0.26939	-0.11969	1	7

5 rows × 47 columns

Data A8

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	8.4185	-1.02750	3.8097	-0.46069	-0.11313	-0.31831	-0.48668	0.061998	-0.17936	1.8128	...	2.3287	-1.07120	0.60466	0.21689	-0.86538	0.56667	0.15432	-0.15648	1	8
1	8.3964	-0.85045	4.0419	-0.20638	-0.23713	-0.20889	-0.49113	0.058464	-0.17396	1.1122	...	-0.2143	1.12470	0.20559	0.19571	-0.43164	0.56542	0.18040	-0.15097	1	8
2	8.2365	-0.63660	2.7441	-0.22716	-0.19239	-0.12711	-0.48922	0.059303	-0.16769	1.0717	...	-4.6852	0.41411	0.74636	1.14870	-0.47517	0.57188	0.19911	-0.14193	1	8
3	9.9174	-1.02300	3.3810	-0.13644	0.22344	-0.12676	-0.48497	0.058485	-0.17214	1.0950	...	-5.1631	-0.92446	-0.28920	0.97297	-0.67540	0.57562	0.22632	-0.12528	1	8
4	12.0660	-1.07710	5.2022	-0.18559	0.34469	-0.21277	-0.47883	0.058452	-0.17811	1.9419	...	-7.8257	-1.85360	0.23603	1.29520	-0.44553	0.57688	0.25956	-0.10212	1	8

5 rows × 47 columns

Data A9

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	8.7247	2.1367	3.8272	0.29438	-0.251680	-0.150600	-0.57701	0.108630	-0.69680	8.5859	...	-0.43419	-1.4612	-0.29120	0.061837	0.32004	0.80032	0.43725	-0.16628	1	9
1	8.6209	2.0501	3.4529	0.23001	-0.260090	-0.132450	-0.58647	0.097419	-0.69026	8.4998	...	-0.49462	-1.5474	-0.34764	0.061880	0.29115	0.80452	0.42985	-0.15922	1	9
2	8.9343	2.0483	3.2762	0.20865	-0.343770	-0.101090	-0.59622	0.089638	-0.68402	9.0870	...	1.04510	-1.2670	-0.41729	0.078868	0.29700	0.81052	0.42296	-0.14864	1	9
3	9.0687	2.0770	3.2327	0.19724	-0.240970	-0.061406	-0.60466	0.082541	-0.67536	9.3614	...	-0.43600	-1.0416	-0.23429	-0.076365	0.47814	0.81665	0.41216	-0.14415	1	9
4	9.0529	1.9801	3.4110	0.23849	-0.098035	-0.009065	-0.61008	0.075034	-0.67158	9.3395	...	-0.52300	-1.6561	-0.34388	0.025793	0.40678	0.82285	0.39656	-0.14316	1	9

5 rows × 47 columns

Data A10

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	6.4472	0.794360	3.2343	0.33634	0.31322	0.089312	-0.73641	-0.24723	-0.78335	4.7357	...	5.5313	-1.0797	1.25020	0.202910	-1.850100	0.35161	0.64004	0.34084	1	10
1	6.2891	0.829760	3.9644	0.34678	-0.49918	0.058186	-0.74201	-0.25521	-0.77550	5.1193	...	4.1281	-0.3847	0.78973	0.268360	-1.420900	0.29186	0.69564	0.31894	1	10
2	7.3623	0.424280	3.1792	0.43363	-0.71590	0.048346	-0.76919	-0.26624	-0.74970	4.4550	...	5.4244	-1.0110	0.91398	0.088971	-0.821490	0.24739	0.73016	0.28838	1	10
3	8.6130	0.066788	3.0073	0.31020	-0.34540	0.126940	-0.78180	-0.27281	-0.73544	4.6347	...	-1.1323	2.5686	1.26910	0.852840	-0.064542	0.22006	0.75626	0.22878	1	10
4	9.8696	-0.146260	3.7539	0.21804	-0.26881	0.139410	-0.79531	-0.27476	-0.72334	4.7114	...	-10.5110	1.1161	-0.44249	1.592400	-0.793200	0.19679	0.75630	0.24298	1	10

5 rows × 47 columns

Data A11

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	6.6557	-0.055184	3.0757	-0.094558	0.33710	-0.182210	-0.80156	-0.23641	-0.72064	-0.801700	...	2.18130	-0.24751	1.49190	0.28927	-2.46090	0.34795	0.61430	0.24852	1	11
1	6.1990	-0.319740	3.4584	0.069893	-0.14144	-0.012154	-0.80332	-0.24006	-0.71867	0.006799	...	1.74180	-0.39902	1.10530	0.15973	-2.10940	0.27711	0.66468	0.24246	1	11
2	7.2951	-0.180350	3.4527	0.268480	-0.52003	0.118450	-0.81813	-0.24244	-0.70116	-0.428610	...	1.04760	-1.12540	0.24221	0.26031	-1.71780	0.21685	0.70100	0.24907	1	11
3	8.5044	0.210300	3.3749	0.263280	-0.41806	0.157370	-0.83226	-0.24090	-0.68579	-1.723700	...	-0.53555	0.22328	-0.27755	0.70244	-1.37640	0.16478	0.72194	0.26961	1	11
4	9.5151	-0.214170	3.7529	0.128850	-0.23175	0.037909	-0.84461	-0.24146	-0.66953	-2.394200	...	-5.01390	0.27262	-0.24619	0.97657	-0.82687	0.12044	0.73083	0.29127	1	11

5 rows × 47 columns

Data A12

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	0.81724	1.288600	0.018014	0.66980	0.55925	0.14177	-0.62865	-0.18386	-0.84973	2.52290	...	-6.52280	4.08890	-2.21270	-1.274700	-0.92606	0.70577	0.24871	0.023830	1	12
1	3.73310	0.476780	0.810810	0.65710	-1.03450	0.13341	-0.66446	-0.19578	-0.81854	0.69066	...	-6.33550	-1.33700	-2.76560	0.334330	-2.19330	0.70106	0.28390	0.056167	1	12
2	12.28000	2.450600	5.141400	-3.02610	-3.94530	0.56975	-0.75723	-0.14182	-0.75214	0.72034	...	-1.54200	-0.84539	0.54323	-1.802600	-1.98440	0.65896	0.35983	0.072961	1	12
3	21.35200	-2.861000	3.511800	1.52060	0.61876	-0.16076	-0.81792	-0.11266	-0.69968	-3.34610	...	-0.82442	-0.99819	1.37890	0.612280	-3.42260	0.60150	0.42900	0.081204	1	12
4	15.29700	-0.089672	10.005000	0.56109	1.20550	0.79281	-0.80930	-0.11132	-0.71446	2.65380	...	10.37700	-1.56190	1.60470	-0.032231	-3.45600	0.50154	0.53087	0.089600	1	12

5 rows × 47 columns

Data A13

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	8.5370	0.16942	1.8751	-0.333680	-0.340950	0.079021	-0.70261	-0.25852	-0.59242	6.83990	...	-1.4610	-0.81777	-0.86097	0.024859	0.71324	0.70895	0.34430	0.57457	1	13
1	9.3906	-0.32832	2.3633	-0.156250	-0.219140	0.004049	-0.70960	-0.25274	-0.58763	5.22860	...	-3.0755	-0.98083	-0.59995	-0.221950	0.78322	0.70115	0.29672	0.58648	1	13
2	9.4116	-0.63955	2.3390	-0.042168	0.025051	0.097992	-0.70949	-0.25604	-0.58572	4.09870	...	-3.3664	-2.57400	-0.40270	0.022696	0.42732	0.69472	0.25458	0.59648	1	13
3	11.4220	-0.46698	3.3253	0.229030	-0.181110	-0.093838	-0.71701	-0.25414	-0.58106	3.70450	...	-1.5863	0.52078	0.61991	0.138260	0.53894	0.67546	0.24674	0.59707	1	13
4	18.3360	2.27760	3.4105	0.527090	-1.250600	-0.436430	-0.73504	-0.27142	-0.55301	0.42828	...	-1.5191	-1.56510	0.26488	0.163930	0.29631	0.67801	0.24276	0.58767	1	13

5 rows × 47 columns

Data A14

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	6.4472	0.794360	3.2343	0.33634	0.31322	0.089312	-0.73641	-0.24723	-0.78335	4.7357	...	5.5313	-1.0797	1.25020	0.202910	-1.850100	0.35161	0.64004	0.34084	1	14
1	6.2891	0.829760	3.9644	0.34678	-0.49918	0.058186	-0.74201	-0.25521	-0.77550	5.1193	...	4.1281	-0.3847	0.78973	0.268360	-1.420900	0.29186	0.69564	0.31894	1	14
2	7.3623	0.424280	3.1792	0.43363	-0.71590	0.048346	-0.76919	-0.26624	-0.74970	4.4550	...	5.4244	-1.0110	0.91398	0.088971	-0.821490	0.24739	0.73016	0.28838	1	14
3	8.6130	0.066788	3.0073	0.31020	-0.34540	0.126940	-0.78180	-0.27281	-0.73544	4.6347	...	-1.1323	2.5686	1.26910	0.852840	-0.064542	0.22006	0.75626	0.22878	1	14
4	9.8696	-0.146260	3.7539	0.21804	-0.26881	0.139410	-0.79531	-0.27476	-0.72334	4.7114	...	-10.5110	1.1161	-0.44249	1.592400	-0.793200	0.19679	0.75630	0.24298	1	14

5 rows × 47 columns

Data A15

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	8.8547	2.5172	5.6712	0.098255	-0.342280	-0.050921	-0.62619	-0.23505	0.059984	3.3461	...	-5.3231	0.11114	-0.793480	-0.320180	2.2109	0.20417	0.54493	0.13374	1	15
1	8.7022	1.6966	5.5677	-0.168610	-0.090065	-0.021410	-0.62696	-0.23530	0.065239	2.9214	...	-5.8537	0.33484	-0.397960	-0.376220	2.7069	0.25241	0.50019	0.13955	1	15
2	7.9563	1.1351	4.8423	-0.171230	0.153620	0.069521	-0.62573	-0.23566	0.063704	4.5925	...	-9.4080	-1.61480	-0.123760	-0.027869	2.8290	0.30072	0.44343	0.13685	1	15
3	7.9569	1.5039	5.2475	-0.110230	0.265090	0.117490	-0.62582	-0.23530	0.064491	4.9111	...	-14.0060	2.54380	-0.075773	0.500320	2.3134	0.33532	0.38125	0.15262	1	15
4	8.4688	1.1872	5.6149	-0.130260	0.117320	0.171050	-0.62746	-0.23315	0.060846	3.8658	...	-13.7720	0.23048	0.738040	-0.526210	1.9541	0.35359	0.33905	0.14816	1	15

5 rows × 47 columns

Data A16

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	8.7083	-0.3995	5.0678	-1.175700	0.011421	0.120370	-0.87472	0.47981	-0.122210	1.02050	...	-11.7890	0.008857	-0.15823	0.202390	1.446800	0.56069	0.53672	-0.38341	1	16
1	8.7788	-1.5610	4.5535	-1.440800	0.350330	0.277180	-0.86956	0.49493	-0.101580	-0.23497	...	-9.5209	-0.595530	-0.11660	0.133780	0.899390	0.58163	0.51176	-0.38017	1	16
2	8.9129	-1.9814	3.8057	-0.716700	0.237310	0.260380	-0.86345	0.50845	-0.093093	-0.67437	...	-8.0112	-1.380900	-0.44792	-0.068992	0.665950	0.59515	0.49679	-0.37523	1	16
3	8.4972	-1.4827	4.0595	-0.093779	0.085624	0.094063	-0.85895	0.51836	-0.082654	-0.65930	...	-9.4357	-1.628900	-0.39459	-0.086804	0.392740	0.60377	0.48962	-0.36717	1	16
4	8.4532	-1.1870	4.2923	-0.029639	-0.469450	0.105670	-0.85770	0.52080	-0.078914	-0.70385	...	-9.5993	-2.067100	0.18424	-0.104880	-0.026756	0.60820	0.48349	-0.36560	1	16

5 rows × 47 columns

Data A17

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	7.8978	1.30640	4.6354	-0.137230	1.17080	-0.139200	-0.47348	-0.19140	-0.82454	-1.06580	...	-9.0521	0.73779	0.448410	-0.091439	0.21744	-0.32341	0.91888	0.062546	1	17
1	7.4466	0.97258	5.6668	-0.367540	1.02590	-0.044956	-0.43664	-0.18032	-0.84818	-0.27705	...	-7.9902	0.45604	0.233810	-0.143730	0.32794	-0.31411	0.92323	0.053142	1	17
2	7.5963	1.31070	6.0208	0.062039	0.44233	0.034789	-0.41659	-0.17650	-0.85550	-0.65312	...	-8.8847	0.20354	0.449880	-0.011381	0.40258	-0.30304	0.92842	0.039298	1	17
3	7.8992	1.20110	6.8952	-0.105440	1.01750	0.037630	-0.39336	-0.17233	-0.86759	-2.94990	...	-8.2436	0.39458	0.207030	0.047585	0.48489	-0.28655	0.93104	0.026861	1	17
4	7.5324	1.32630	7.8182	-0.265090	0.60797	0.015475	-0.35811	-0.16696	-0.88662	-1.37580	...	-7.7755	0.27910	-0.015015	-0.084695	0.59460	-0.26714	0.93805	0.024318	1	17

5 rows × 47 columns

Data A18

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	0.58824	-0.46775	1.13470	0.28030	-0.28740	0.091622	-0.63178	0.49029	-0.22953	-0.343400	...	-3.1755	0.81208	-0.76055	-0.340700	-0.64684	0.45426	0.066652	-0.47630	1	18
1	1.57290	-0.42275	0.87383	0.50617	0.32787	0.091195	-0.62074	0.48747	-0.24106	0.210960	...	-1.2480	-3.87190	0.34547	0.424590	-0.90376	0.43546	0.085318	-0.47941	1	18
2	6.53150	-0.12955	6.56940	0.51402	-0.70918	0.233250	-0.59990	0.48578	-0.26952	-0.066273	...	-16.0600	4.01820	1.84440	-0.167070	-1.49850	0.43232	0.052691	-0.47850	1	18
3	32.70000	3.52340	13.31300	0.44433	-0.97718	-0.382790	-0.60216	0.47855	-0.24898	5.966700	...	14.6510	-0.36682	1.84180	0.639820	-1.54800	0.41855	0.031113	-0.48635	1	18
4	23.68600	-1.79300	13.91200	-0.29934	1.76930	0.305580	-0.60506	0.48405	-0.22216	8.755100	...	11.9660	-2.23480	-3.26850	-0.014257	1.01570	0.42558	0.051689	-0.47870	1	18

5 rows × 47 columns

Data A19

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	14.4420	3.772600	2.8641	0.20993	-0.061777	0.026943	-0.73288	-0.29558	-0.56236	-0.99592	...	-0.20674	-1.94170	-1.033400	0.275830	-0.344240	0.75082	0.58856	0.36062	1	19
1	11.8020	2.703200	1.4197	-0.68598	0.433890	0.112600	-0.72957	-0.28442	-0.57182	1.95910	...	0.34018	-2.31040	-0.671140	0.043867	-0.076053	0.74631	0.57998	0.38418	1	19
2	9.3930	1.162800	2.4657	-1.09840	0.524140	0.105930	-0.72026	-0.26318	-0.59445	0.20991	...	-2.16350	-1.03190	-0.383860	-0.177500	0.105990	0.75100	0.57046	0.38884	1	19
3	7.3962	0.473350	1.0436	-1.08830	0.266860	0.039275	-0.71369	-0.23397	-0.61395	0.51040	...	-0.58301	-0.95279	-0.253310	-0.037087	-0.031941	0.75578	0.56489	0.39015	1	19
4	6.5668	-0.023664	1.0341	-0.68573	0.138540	-0.014443	-0.70882	-0.21003	-0.62582	-0.69861	...	-0.78841	-0.98438	-0.010851	-0.076766	0.054573	0.75600	0.56398	0.38938	1	19

5 rows × 47 columns

Setelah melakukan kombinasi data dari setiap aktifitas selanjutnya mengkombinasikan semua aktifitas

	T_xacc	T_yacc	T_zacc	T_xgyro	T_ygyro	T_zgyro	T_xmag	T_ymag	T_zmag	RA_xacc	...	LL_yacc	LL_zacc	LL_xgyro	LL_ygyro	LL_zgyro	LL_xmag	LL_ymag	LL_zmag	Subject	Activity
0	8.13050	1.03490	5.42170	-0.009461	0.001915	-0.003424	-0.78712	-0.069654	0.157300	0.70097	...	-9.0812	2.6220	-0.000232	-0.012092	-0.004457	0.74017	0.30053	-0.057730	1	1
1	8.13050	1.02020	5.38430	-0.009368	0.023485	0.001953	-0.78717	-0.068275	0.158900	0.71829	...	-9.0737	2.6218	-0.014784	-0.016477	0.002789	0.73937	0.30183	-0.057514	1	1
2	8.16040	1.02010	5.36220	0.015046	0.014330	0.000204	-0.78664	-0.068277	0.158790	0.69849	...	-9.0886	2.6366	-0.012770	0.005717	-0.007918	0.73955	0.30052	-0.057219	1	1
3	8.16030	1.00520	5.37700	0.006892	0.018045	0.005649	-0.78529	-0.069849	0.159120	0.72799	...	-9.0811	2.6070	-0.005725	0.009620	0.006555	0.74029	0.30184	-0.057750	1	1
4	8.16050	1.02750	5.34730	0.008811	0.030433	-0.005346	-0.78742	-0.068796	0.159160	0.71572	...	-9.0737	2.6218	-0.003929	-0.008371	0.002816	0.73845	0.30090	-0.057527	1	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
59995	16.00800	-2.01660	-0.58220	2.027100	1.656800	0.584410	-0.73195	-0.476070	-0.013494	16.43100	...	4.3231	-4.5931	-0.230600	0.180890	-2.082300	0.56876	0.39409	0.518170	8	19
59996	8.28230	-0.69936	0.46698	2.887900	1.603900	-0.020417	-0.73055	-0.472470	-0.012385	7.01620	...	1.2551	-4.1113	1.817200	0.312510	-1.021600	0.53822	0.43745	0.504010	8	19
59997	2.71210	0.49967	0.84053	1.996400	1.465800	-0.072605	-0.72533	-0.478630	-0.012810	-4.55400	...	15.6940	1.2942	1.842100	0.349400	-0.282080	0.51752	0.47280	0.489250	8	19
59998	2.03080	-0.71349	-0.11264	1.766100	1.010300	-0.102120	-0.71933	-0.482240	-0.011469	-6.85690	...	-7.4632	-12.3640	-0.150260	1.563400	-0.368450	0.50440	0.51029	0.446480	8	19
59999	-0.04915	0.76302	-0.19343	2.590200	0.179090	0.011850	-0.71592	-0.483020	0.022000	-6.80130	...	15.0540	7.0935	-3.677800	0.151150	-0.740350	0.47028	0.43618	0.545110	8	19

1140000 rows × 47 columns

Setelah mengkombinasikan aktifitas selanjutnya dataset dibuat menjadi format csv

```
dataset.to_csv('dataset.csv',index=False)
```

```
data = pd.read_csv('dataset.csv')
data
```

Dimention Reduction using PCA

karena feature yang dimiliki oleh dataset sangat banyak, maka kami perlu mereduksi dimensi sehingga dapat dilakukan clustering.

```
from sklearn.preprocessing import StandardScaler
from sklearn.decomposition import PCA
from sklearn.cluster import KMeans

data_rescaled = data.iloc[:,0:]
data_rescaled = StandardScaler().fit_transform(X)
data_rescaled
```

```
array([[ 0.06505241,  0.70123263,  0.74736228, ..., -0.3441589 ,
        -1.52752523, -1.64316767],
       [ 0.06505241,  0.69562524,  0.73676887, ..., -0.34355475,
        -1.52752523, -1.64316767],
       [ 0.07036864,  0.6955871 ,  0.73050913, ..., -0.34272963,
        -1.52752523, -1.64316767],
       ...,
       [-0.89834045,  0.49706651, -0.55023648, ...,  1.18574874,
         1.52752523,  1.64316767],
       [-1.01947576,  0.03430066, -0.82021821, ...,  1.06612069,
         1.52752523,  1.64316767],
       [-1.38929139,  0.59752267, -0.84310166, ...,  1.34198963,
         1.52752523,  1.64316767]])
```

Komponen. Ini masih terbilang cukup banyak untuk dilakukan klastering. maka kami membatasi hanya sebanyak 2 komponen saja.

```
pca = PCA(n_components=2)
principalComponents = pca.fit_transform(X)
pca.explained_variance_ratio_
```

```
array([0.12697962, 0.11074606])
```

```
principalDf = pd.DataFrame(data = principalComponents)
principalDf.head()
```

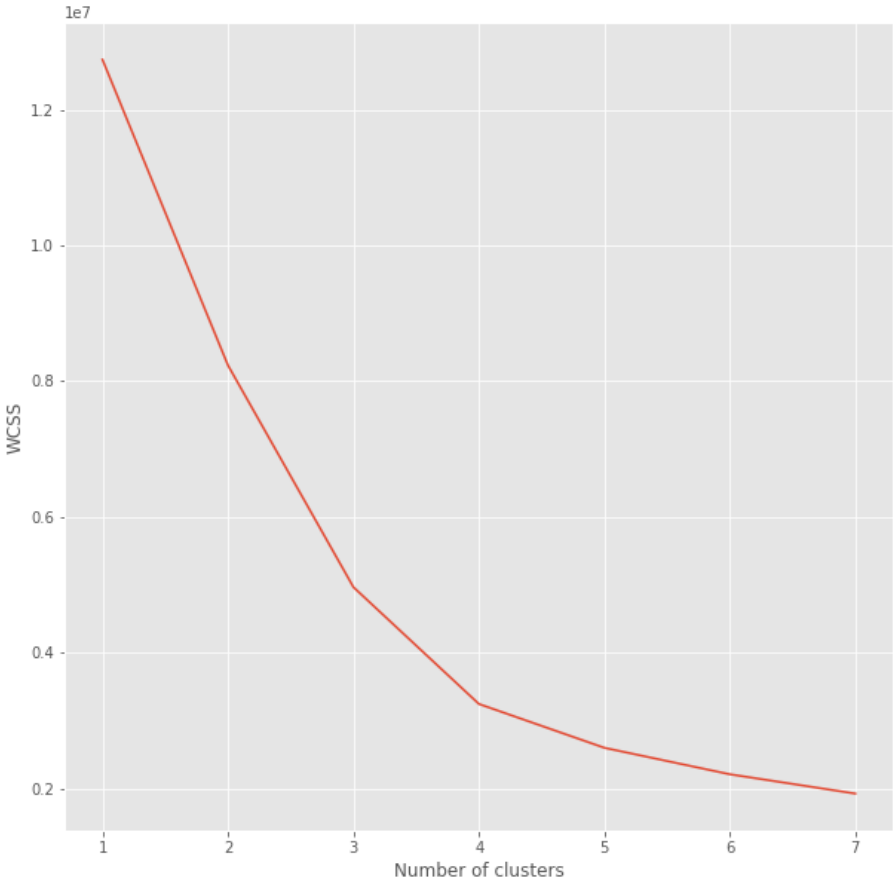
	0	1
0	-0.101961	-0.290269
1	-0.098167	-0.300640
2	-0.097077	-0.293821
3	-0.092515	-0.303711
4	-0.098528	-0.295837

Clustering

Kami melakukan clustering menggunakan metode KMeans karena menurut kami metode ini adalah metode yang paling mudah digunakan didalam python karena sudah disediakan library untuk menggunakan KMeans. Sebelum dilakukan clustering kami melakukan elbow method untuk menentukan jumlah cluster terbaik yang akan digunakan nanti.

```
# finding best n clusters using elbow method

wcss = []
for i in range(1,8):
   model = KMeans(n_clusters = i, init = "k-means++")
   model.fit(principalDf)
   wcss.append(model.inertia_)
plt.figure(figsize=(10,10))
plt.plot(range(1,8), wcss)
plt.xlabel('Number of clusters')
plt.ylabel('WCSS')
plt.show()
```



Dalam menentukan cluster terbaik menggunakan elbow method, kita harus melihat persentase hasil perbandingan antara jumlah cluster yang akan membentuk siku pada suatu titik. Maka dari grafik kami mendapat kesimpulan bahwa jumlah cluster terbaik adalah 4 cluster.

```
kmeans = KMeans(n_clusters = 4)
#Compute cluster centers and predict cluster indices
X_clustered = kmeans.fit_predict(principalComponents)

#Define our own color map
LABEL_COLOR_MAP = {0:'red', 1: 'green', 2: 'blue' , 3:'yellow'}
label_color = [LABEL_COLOR_MAP[l] for l in X_clustered]

# Plot the scatter diagram
plt.figure(figsize = (20,20))
plt.scatter(principalComponents[:,0],principalComponents[:,1], c= label_color, alpha=0.5)
plt.xlabel('Principle Component1')
plt.ylabel('Principle Component2')
plt.show()
```