BELLABEAT

Presented by
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Project Purpose

Analyze user behavior and identify what are the trends in smart device usage. The insight gained will help Bellabeat to understand how customers are using one of its wellness products and how the company can improve their marketing strategies and product features based on these patterns.

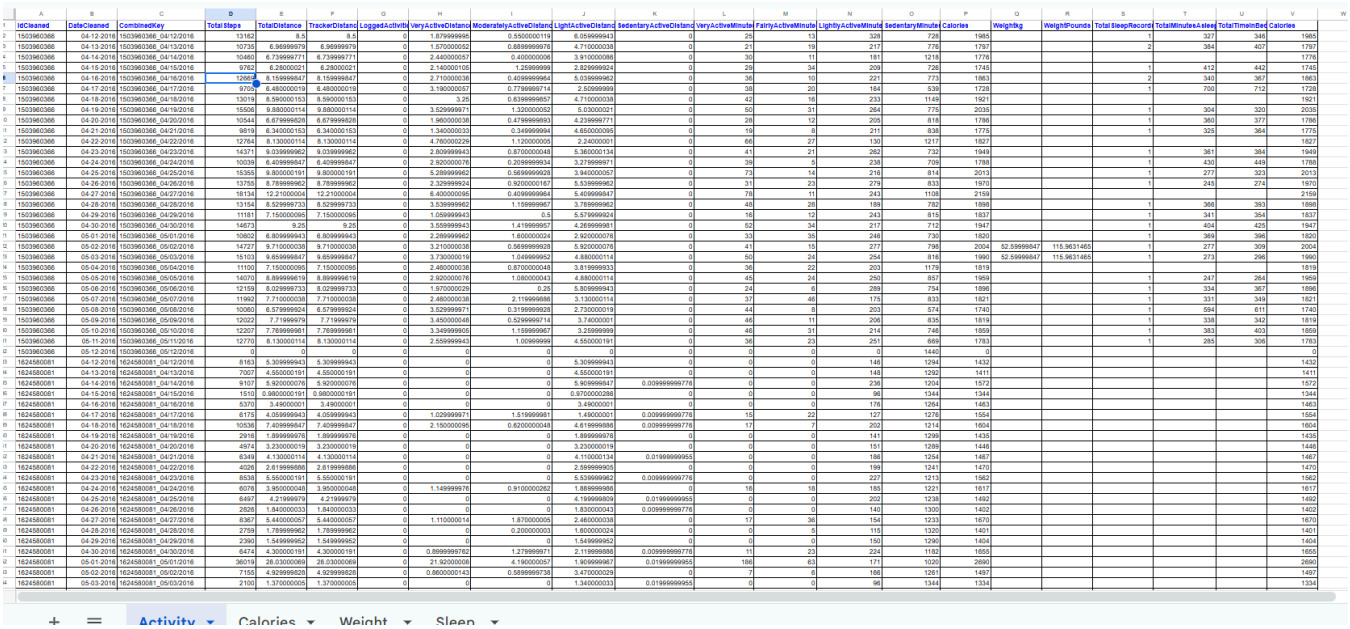
The analysis focuses on key wellness indicators including:
Calories Burned
Total Hours of Sleep
Weight (Kg)

Other metrics like activity level or total time in bed, were excluded to focus on the most relevant wellness indicators.

Data Cleaning Steps:

1- Removed zeros and missing values to ensure accurate averages.
2- Convert sleep from minutes to hours.
3- Created a “people table” with average calories, average sleep hours, and average weight per user.

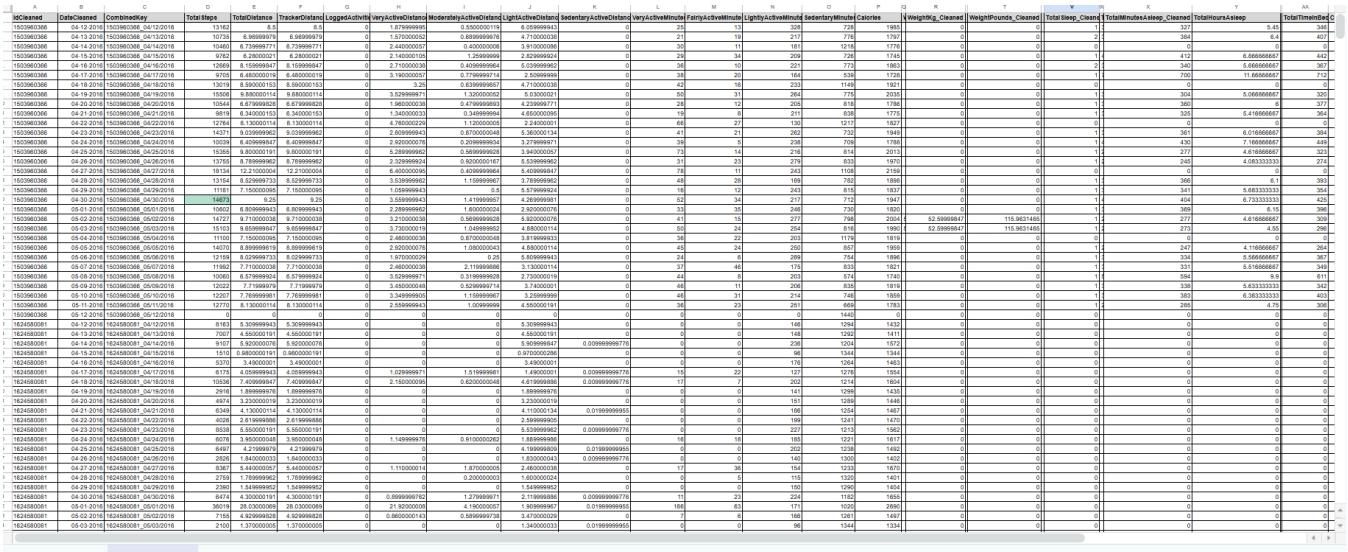
Raw Data



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	Id	DateCleaned	CombinedKey	Total Steps	TotalDistance	TrackerDistanc	LoggedActivitie	VeryActiveDistanc	ModeratelyActiveDistanc	LightActiveDistanc	SedentaryActiveDistanc	VeryActiveMinute	FairlyActiveMinute	LightlyActiveMinute	SedentaryMinute	Calories	WeightKg	WeightPounds	Total SleepRecord	TotalMinutesAsleep	TotalTimeInBed	Calories	
2	1503960366	04-12-2016	1503960366_04/12/2016	13162	8.5	8.5	0	1.879999995	0.550000119	6.059999943	0	25	13	328	728	1985			1	327	346	1985	
3	1503960366	04-13-2016	1503960366_04/13/2016	10735	6.96999979	6.96999979	0	1.570000052	0.689999978	4.710000038	0	21	19	217	776	1797			2	384	407	1797	
4	1503960366	04-14-2016	1503960366_04/14/2016	10460	6.739999771	6.739999771	0	2.440000057	0.400000006	3.910000086	0	30	11	181	1218	1776						1776	
5	1503960366	04-15-2016	1503960366_04/15/2016	9762	6.28000021	6.28000021	0	2.140000105	1.25999999	2.829999924	0	29	34	209	726	1745			1	412	442	1745	
6	1503960366	04-16-2016	1503960366_04/16/2016	12669	8.159999847	8.159999847	0	2.710000038	0.409999964	5.039999962	0	36	10	221	773	1863			2	340	367	1863	
7	1503960366	04-17-2016	1503960366_04/17/2016	9705	6.480000019	6.480000019	0	3.190000057	0.779999714	2.50999999	0	38	20	164	539	1728			1	700	712	1728	
8	1503960366	04-18-2016	1503960366_04/18/2016	13019	8.590000153	8.590000153	0	3.25	0.639999857	4.710000038	0	42	16	233	1149	1921						1921	
9	1503960366	04-19-2016	1503960366_04/19/2016	15506	9.880000114	9.880000114	0	3.529999971	1.320000052	5.03000021	0	50	31	264	775	2035			1	304	320	2035	
10	1503960366	04-20-2016	1503960366_04/20/2016	10544	6.679999828	6.679999828	0	1.960000038	0.479999983	4.239999771	0	28	12	205	818	1786			1	360	377	1786	
11	1503960366	04-21-2016	1503960366_04/21/2016	9819	6.340000153	6.340000153	0	1.340000033	0.349999994	4.650000095	0	19	8	211	838	1775			1	325	364	1775	
12	1503960366	04-22-2016	1503960366_04/22/2016	12764	8.130000114	8.130000114	0	4.760000229	1.120000005	2.24000001	0	66	27	130	1217	1827						1827	
13	1503960366	04-23-2016	1503960366_04/23/2016	14371	9.039999962	9.039999962	0	2.809999943	0.870000048	5.360000134	0	41	21	262	732	1949			1	361	384	1949	
14	1503960366	04-24-2016	1503960366_04/24/2016	10039	6.409999847	6.409999847	0	2.920000076	0.209999934	3.279999971	0	39	5	238	709	1788			1	430	449	1788	
15	1503960366	04-25-2016	1503960366_04/25/2016	15355	9.800000191	9.800000191	0	5.289999962	0.569999928	3.940000057	0	73	14	216	814	2013			1	277	323	2013	
16	1503960366	04-26-2016	1503960366_04/26/2016	13755	8.789999962	8.789999962	0	2.329999924	0.920000187	5.539999962	0	31	23	279	833	1970			1	245	274	1970	
17	1503960366	04-27-2016	1503960366_04/27/2016	18134	12.21000004	12.21000004	0	6.400000095	0.409999964	5.409999847	0	78	11	243	1108	2159						2159	
18	1503960366	04-28-2016	1503960366_04/28/2016	13154	8.529999733	8.529999733	0	3.539999962	1.159999967	3.789999962	0	48	28	189	782	1898			1	366	393	1898	
19	1503960366	04-29-2016	1503960366_04/29/2016	11181	7.150000095	7.150000095	0	1.059999943	0.5	5.579999924	0	16	12	243	815	1837			1	341	354	1837	
20	1503960366	04-30-2016	1503960366_04/30/2016	14673	9.25	9.25	0	3.559999943	1.419999957	4.269999981	0	52	34	217	712	1947			1	404	425	1947	
21	1503960366	05-01-2016	1503960366_05/01/2016	10802	6.809999943	6.809999943	0	2.289999962	1.600000024	2.920000076	0	33	35	248	730	1820			1	369	396	1820	
22	1503960366	05-02-2016	1503960366_05/02/2016	14727	9.710000038	9.710000038	0	3.210000038	0.569999928	5.920000076	0	41	15	277	798	2004	52.59999847	115.9631465	1	277	309	2004	
23	1503960366	05-03-2016	1503960366_05/03/2016	15103	9.859999847	9.859999847	0	3.730000019	1.049999952	4.880000114	0	50	24	254	816	1990	52.59999847	115.9631465	1	273	296	1990	
24	1503960366	05-04-2016	1503960366_05/04/2016	11100	7.150000095	7.150000095	0	2.460000038	0.870000048	3.819999933	0	36	22	203	1179	1819						1819	
25	1503960366	05-05-2016	1503960366_05/05/2016	14070	8.899999619	8.899999619	0	2.920000076	1.080000043	4.880000114	0	45	24	250	857	1959			1	247	264	1959	
26	1503960366	05-06-2016	1503960366_05/06/2016	12159	8.029999733	8.029999733	0	1.970000029	0.25	5.809999943	0	24	6	289	754	1896			1	334	367	1896	
27	1503960366	05-07-2016	1503960366_05/07/2016	11992	7.710000038	7.710000038	0	2.460000038	2.119999886	3.130000114	0	37	46	175	833	1821			1	331	349	1821	
28	1503960366	05-08-2016	1503960366_05/08/2016	10080	6.579999924	6.579999924	0	3.529999971	0.319999928	2.730000019	0	44	8	203	574	1740			1	594	611	1740	
29	1503960366	05-09-2016	1503960366_05/09/2016	12022	7.71999979	7.71999979	0	3.450000048	0.529999714	3.74000001	0	46	11	206	835	1819			1	338	342	1819	
30	1503960366	05-10-2016	1503960366_05/10/2016	12207	7.769999981	7.769999981	0	3.349999905	1.159999967	3.259999999	0	46	31	214	746	1859			1	383	403	1859	
31	1503960366	05-11-2016	1503960366_05/11/2016	12770	8.130000114	8.130000114	0	2.559999943	1.09999999	4.550000191	0	36	23	251	669	1783			1	285	306	1783	
32	1503960366	05-12-2016	1503960366_05/12/2016	0	0	0	0	0	0	0	0	0	0	0	1440	0						0	
33	1624580081	04-12-2016	1624580081_04/12/2016	8163	5.309999943	5.309999943	0	0	0	5.309999943	0	0	0	148	1294	1432						1432	
34	1624580081	04-13-2016	1624580081_04/13/2016	7007	4.550000191	4.550000191	0	0	0	4.550000191	0	0	0	148	1292	1411						1411	
35	1624580081	04-14-2016	1624580081_04/14/2016	9107	5.920000076	5.920000076	0	0	0	5.909999847	0.009999999776	0	0	236	1204	1572						1572	
36	1624580081	04-15-2016	1624580081_04/15/2016	1510	0.980000191	0.980000191	0	0	0	0.970000286	0	0	0	96	1344	1344						1344	
37	1624580081	04-16-2016	1624580081_04/16/2016	5370	3.49000001	3.49000001	0	0	0	3.49000001	0	0	0	176	1264	1463						1463	
38	1624580081	04-17-2016	1624580081_04/17/2016	6175	4.059999943	4.059999943	0	1.029999971	1.519999981	1.490000021	0.009999999776	15	22	127	1276	1554						1554	
39	1624580081	04-18-2016	1624580081_04/18/2016	10536	7.409999847	7.409999847	0	2.150000095	0.620000048	4.619999886	0.009999999776	17	7	202	1214	1604						1604	
40	1624580081	04-19-2016	1624580081_04/19/2016	2916	1.899999976	1.899999976	0	0	0	1.899999976	0	0	0	141	1299	1435						1435	
41	1624580081	04-20-2016	1624580081_04/20/2016	4974	3.230000019	3.230000019	0	0	0	3.230000019	0	0	0	151	1289	1446						1446	
42	1624580081	04-21-2016	1624580081_04/21/2016	6349	4.130000114	4.130000114	0	0	0	4.110000134	0.019999999553	0	0	186	1254	1487						1487	
43	1624580081	04-22-2016	1624580081_04/22/2016	4026	2.619999886	2.619999886	0	0	0	2.599999905	0	0	0	199	1241	1470						1470	
44	1624580081	04-23-2016	1624580081_04/23/2016	8538	5.550000191	5.550000191	0	0	0	5.539999962	0.009999999776	0	0	227	1213	1562						1562	
45	1624580081	04-24-2016	1624580081_04/24/2016	6076	3.950000048	3.950000048	0	1.149999976	0.910000262	1.889999986	0	16	18	185	1221	1617						1617	
46	1624580081	04-25-2016	1624580081_04/25/2016	6497	4.21999979	4.21999979	0	0	0	4.199999809	0.019999999553	0	0	202	1238	1492						1492	
47	1624580081	04-26-2016	1624580081_04/26/2016	2826	1.840000033	1.840000033	0	0	0	1.830000043	0.009999999776	0	0	140	1300	1402						1402	
48	1624580081	04-27-2016	1624580081_04/27/2016	8387	5.440000057	5.440000057	0	1.110000014	1.870000005	2.460000038	0	17	36	154	1233	1670						1670	
49	1624580081	04-28-2016	1624580081_04/28/2016	2759	1.789999962	1.789999962	0	0	0.200000003	1.600000024	0	0	5	115	1320	1401						1401	
50	1624580081	04-29-2016	1624580081_04/29/2016	2380	1.549999952	1.549999952	0	0	0	1.549999952	0	0	0	150	1290	1404						1404	
51	1624580081	04-30-2016	1624580081_04/30/2016	6474	4.300000191	4.300000191	0	0.899999762	1.279999971	2.119999886	0.009999999776	11	23	224	1182	1655						1655	
52	1624580081	05-01-2016	1624580081_05/01/2016	36019	28.03000069	28.03000069	0	21.92000008	4.190000057	1.909999967	0.019999999553	186	63	171	1020	2690						2690	
53	1624580081	05-02-2016	1624580081_05/02/2016	7165	4.929999828	4.929999828	0	0.860000143	0.589999738	3.470000029	0	7	6	166	1261	1497						1497	
54	1624580081	05-03-2016	1624580081_05/03/2016	2100	1.370000005	1.370000005	0	0	0	1.340000033	0.019999999553	0	0	96	1344	1334						1334	

Activity | Calories | Weight | Sleep

Cleaned Data



Id	DateCleaned	CombinedKey	Total Steps	TotalDistance	TrackerDistance	LoggedActivitiesDistance	VeryActiveDistance	ModeratelyActiveDistance	LightActiveDistance	SedentaryActiveDistance	VeryActiveMinutes	FairlyActiveMinutes	LightlyActiveMinutes	SedentaryMinutes	Calories	WeightKg_Cleaned	WeightPounds_Cleaned	Total Sleep_Cleaned	TotalMinutesAsleep_Cleaned	TotalHoursAsleep	TotalTimeInBed
1503960366	04-12-2016	1503960366_04/12/2016	13162	8.5	8.5	0	1.87999995	0.550000019	6.259999943	0	25	13	328	728	1985	0	0	1	327	5.45	340
1503960366	04-13-2016	1503960366_04/13/2016	10735	6.96999979	6.96999979	0	1.57000052	0.689999976	4.710000038	0	21	19	217	776	1797	0	0	2	384	6.4	407
1503960366	04-14-2016	1503960366_04/14/2016	10460	6.739999771	6.739999771	0	2.440000057	0.400000006	3.910000086	0	30	11	181	1218	1776	0	0	0	0	0	0
1503960366	04-15-2016	1503960366_04/15/2016	9762	6.28000021	6.28000021	0	2.140000105	1.25999999	2.829999924	0	29	34	209	726	1745	0	0	1	412	6.866666667	442
1503960366	04-16-2016	1503960366_04/16/2016	12669	8.159999847	8.159999847	0	2.710000038	0.409999964	5.039999962	0	36	10	221	773	1863	0	0	2	340	5.666666667	367
1503960366	04-17-2016	1503960366_04/17/2016	9705	6.480000019	6.480000019	0	3.190000057	0.779999714	2.50999999	0	38	20	164	539	1728	0	0	1	700	11.66666667	712
1503960366	04-18-2016	1503960366_04/18/2016	13019	8.690000153	8.690000153	0	3.25	0.639999957	4.710000038	0	42	16	233	1149	1921	0	0	0	0	0	0
1503960366	04-19-2016	1503960366_04/19/2016	15556	9.880000114	9.880000114	0	3.529999971	1.320000052	5.03000021	0	50	31	264	775	2035	0	0	1	304	5.066666667	320
1503960366	04-20-2016	1503960366_04/20/2016	10544	6.679999828	6.679999828	0	1.960000038	0.479999953	4.239999771	0	28	12	205	816	1786	0	0	1	360	6	377
1503960366	04-21-2016	1503960366_04/21/2016	9819	6.340000153	6.340000153	0	1.340000033	0.349999994	4.650000095	0	19	8	211	838	1775	0	0	1	325	5.416666667	364
1503960366	04-22-2016	1503960366_04/22/2016	12764	8.130000114	8.130000114	0	4.760000229	1.120000005	2.24000001	0	66	27	130	1217	1827	0	0	0	0	0	0
1503960366	04-23-2016	1503960366_04/23/2016	14371	9.039999962	9.039999962	0	2.809999943	0.870000048	5.360000134	0	41	21	262	732	1949	0	0	1	361	6.016666667	384
1503960366	04-24-2016	1503960366_04/24/2016	10039	6.409999847	6.409999847	0	2.920000076	0.209999904	3.279999971	0	39	5	238	709	1788	0	0	1	430	7.166666667	449
1503960366	04-25-2016	1503960366_04/25/2016	15383	9.800000191	9.800000191	0	5.289999962	0.589999926	3.940000057	0	73	14	216	814	2013	0	0	1	277	4.616666667	323
1503960366	04-26-2016	1503960366_04/26/2016	13755	8.789999962	8.789999962	0	2.329999924	0.920000167	5.539999962	0	31	23	279	833	1970	0	0	1	245	4.083333333	274
1503960366	04-27-2016	1503960366_04/27/2016	18134	12.21000004	12.21000004	0	6.400000095	0.409999964	5.409999847	0	78	11	243	1108	2159	0	0	0	0	0	0
1503960366	04-28-2016	1503960366_04/28/2016	13154	8.529999733	8.529999733	0	3.539999962	1.159999967	3.789999962	0	48	28	169	792	1898	0	0	1	366	6.1	393
1503960366	04-29-2016	1503960366_04/29/2016	11181	7.150000095	7.150000095	0	1.059999943	0.5	5.579999924	0	18	12	243	815	1837	0	0	1	341	5.683333333	354
1503960366	04-30-2016	1503960366_04/30/2016	14673	9.25	9.25	0	3.559999943	1.419999957	4.269999981	0	52	34	217	712	1947	0	0	1	404	6.733333333	425
1503960366	05-01-2016	1503960366_05/01/2016	10602	6.809999943	6.809999943	0	2.289999962	1.600000024	2.920000076	0	33	35	248	730	1820	0	0	1	369	6.15	390
1503960366	05-02-2016	1503960366_05/02/2016	14727	9.710000038	9.710000038	0	3.210000038	0.589999928	5.920000076	0	41	19	277	798	2004	52.59999847	115.9631465	1	277	4.616666667	309
1503960366	05-03-2016	1503960366_05/03/2016	15103	9.659999847	9.659999847	0	3.730000019	1.049999952	4.880000114	0	50	24	254	816	1990	52.59999847	115.9631465	1	273	4.55	296
1503960366	05-04-2016	1503960366_05/04/2016	11100	7.150000095	7.150000095	0	2.480000038	0.870000048	3.819999933	0	36	22	203	1176	1819	0	0	0	0	0	0
1503960366	05-05-2016	1503960366_05/05/2016	14070	8.899999619	8.899999619	0	2.920000076	1.080000043	4.880000114	0	45	24	250	857	1959	0	0	1	247	4.116666667	264
1503960366	05-06-2016	1503960366_05/06/2016	12159	8.029999733	8.029999733	0	1.970000029	0.25	5.809999943	0	24	8	289	754	1896	0	0	1	334	5.566666667	367
1503960366	05-07-2016	1503960366_05/07/2016	11962	7.710000038	7.710000038	0	2.460000038	2.119999886	3.130000114	0	37	46	175	833	1821	0	0	1	331	5.516666667	349
1503960366	05-08-2016	1503960366_05/08/2016	10560	6.579999924	6.579999924	0	3.529999971	0.319999905	2.730000019	0	44	8	203	574	1740	0	0	1	594	9.9	611
1503960366	05-09-2016	1503960366_05/09/2016	12022	7.719999979	7.719999979	0	3.450000048	0.529999974	3.74000001	0	46	11	206	835	1819	0	0	1	338	5.633333333	342
1503960366	05-10-2016	1503960366_05/10/2016	12207	7.769999981	7.769999981	0	3.349999905	1.159999967	3.25999999	0	46	31	214	746	1859	0	0	1	383	6.383333333	403
1503960366	05-11-2016	1503960366_05/11/2016	12770	8.130000114	8.130000114	0	2.559999943	1.03999996	4.550000191	0	36	23	251	669	1783	0	0	1	285	4.75	306
1503960366	05-12-2016	1503960366_05/12/2016	0	0	0	0	0	0	0	0	0	0	0	1440	0	0	0	0	0	0	0
1624580081	04-12-2016	1624580081_04/12/2016	8163	5.309999943	5.309999943	0	0	0	5.309999943	0	0	0	148	1294	1432	0	0	0	0	0	0
1624580081	04-13-2016	1624580081_04/13/2016	7007	4.550000191	4.550000191	0	0	0	4.550000191	0	0	0	149	1292	1411	0	0	0	0	0	0
1624580081	04-14-2016	1624580081_04/14/2016	9107	5.920000076	5.920000076	0	0	0	5.309999847	0.099999999778	0	0	236	1204	1572	0	0	0	0	0	0
1624580081	04-15-2016	1624580081_04/15/2016	1510	0.980000191	0.980000191	0	0	0	0.970000286	0	0	0	96	1344	1344	0	0	0	0	0	0
1624580081	04-16-2016	1624580081_04/16/2016	5370	3.490000081	3.490000081	0	0	0	3.490000081	0	0	0	176	1264	1463	0	0	0	0	0	0
1624580081	04-17-2016	1624580081_04/17/2016	6175	4.059999943	4.059999943	0	1.029999971	1.519999981	1.49000001	0.099999999778	15	22	127	1276	1554	0	0	0	0	0	0
1624580081	04-18-2016	1624580081_04/18/2016	10536	7.409999847	7.409999847	0	2.150000095	0.820000048	4.419999886	0.099999999778	17	7	202	1214	1604	0	0	0	0	0	0
1624580081	04-19-2016	1624580081_04/19/2016	2916	1.899999976	1.899999976	0	0	0	1.899999976	0	0	0	141	1299	1435	0	0	0	0	0	0
1624580081	04-20-2016	1624580081_04/20/2016	4974	3.230000019	3.230000019	0	0	0	3.230000019	0	0	0	151	1289	1448	0	0	0	0	0	0
1624580081	04-21-2016	1624580081_04/21/2016	6349	4.130000114	4.130000114	0	0	0	4.110000134	0.019999999553	0	0	196	1254	1467	0	0	0	0	0	0
1624580081	04-22-2016	1624580081_04/22/2016	4026	2.619999886	2.619999886	0	0	0	2.599999905	0	0	0	199	1241	1470	0	0	0	0	0	0
1624580081	04-23-2016	1624580081_04/23/2016	8538	5.550000191	5.550000191	0	0	0	5.539999962	0.009999999776	0	0	227	1213	1562	0	0	0	0	0	0
1624580081	04-24-2016	1624580081_04/24/2016	6078	3.950000048	3.950000048	0	1.149999976	0.910000262	1.889999986	0	16	18	185	1221	1617	0	0	0	0	0	0
1624580081	04-25-2016	1624580081_04/25/2016	6497	4.21999979	4.21999979	0	0	0	4.199999809	0.019999999553	0	0	202	1238	1492	0	0	0	0	0	0
1624580081	04-26-2016	1624580081_04/26/2016	2826	1.840000033	1.840000033	0	0	0	1.830000043	0.009999999776	0	0	140	1300	1402	0	0	0	0	0	0
1624580081	04-27-2016	1624580081_04/27/2016	8367	5.440000057	5.440000057	0	1.110000014	1.870000005	2.460000038	0	17	36	154	1233	1670	0	0	0	0	0	0
1624580081	04-28-2016	1624580081_04/28/2016	2759	1.789999962	1.789999962	0	0	0.200000003	1.600000024	0	0	5	115	1320	1401	0	0	0	0	0	0
1624580081	04-29-2016	1624580081_04/29/2016	2360	1.549999952	1.549999952	0	0	0	1.549999952	0	0	0	150	1290	1404	0	0	0	0	0	0
1624580081	04-30-2016	1624580081_04/30/2016	6474	4.300000191	4.300000191	0	0.899999762	1.279999971	2.119999886	0.099999999778	11	23	224	1182	1655	0	0	0	0	0	0
1624580081	05-01-2016	1624580081_05/01/2016	36019	28.03000069	28.03000069	0	21.92000008	4.190000057	1.909999967	0.019999999553	166	63	171	1020	2690	0	0	0	0	0	0
1624580081	05-02-2016	1624580081_05/02/2016	7155	4.929999828	4.929999828	0	0.860000143	0.589999738	3.470000029	0	7	8	168	1261	1497	0	0	0	0	0	0
1624580081	05-03-2016	1624580081_05/03/2016	2100	1.370000005	1.370000005	0	0	0	1.340000033	0.019999999553	0	0	96	1344	1334	0	0	0	0	0	0

Limitations

Some daily data is missing, which may affect the accuracy of trends over time.

The dataset does not include Bellabeat product-level information; insights are applied hypothetically.

Metrics not included (e.g., activity level, total time in bed) may provide additional context but are outside the scope of this analysis.

Data Cleaning and Manipulation

To prepare the data for analysis, the following steps were performed:

We had different spreadsheets with the data so we merged in one spreadsheet and the information to make it more easy and understandable to use.

Also the spreadsheet had a lot of missing data. I added number 0 to fill in the missing data for an easy way to do visualizations even though I filtered all the values to give more accurate results to the analysis.

Pivot Tables: Created separate pivot tables for calories, sleep, and weight.

Filtering: Removed zeros and missing values from all metrics.

Conversions: Sleep minutes were converted to hours to make the data more understandable.

Averages: Calculated the average calories, sleep hours, and weight per user, creating a “people table.”

Analysis Summary

After cleaning the data, the following analyses were performed:

- Calculated average calories burned per user.
- Calculated average total hours of sleep per user.
- Calculated average weight per user.
- Observed general trends and patterns across users.
- I used a scatter plot between calories and hours of sleep and the same with calories and weight(kg) revealed that most users burned between 2000 and 4000 calories per day and slept between 2.8 and 3.5 hours on average. The points were highly clustered, indicating no strong correlation similarly between weight and calories burned.
- The results might be influenced by limitations in the data set like the amount of participants were not enough, short tracking period and a lot of missing data specially for sleep and weight. While no correlation was observed, this analysis highlights the importance of collecting more comprehensive and diverse user data

DateCleaned	AVERAGE of WeightKg_Cleaned
04-12-2016	4.49
04-13-2016	8.50
04-14-2016	4.43
04-15-2016	1.86
04-16-2016	4.61
04-17-2016	7.02
04-18-2016	6.77
04-19-2016	4.58
04-20-2016	4.58
04-21-2016	6.33
04-22-2016	1.92
04-23-2016	4.59
04-24-2016	4.59
04-25-2016	6.79
04-26-2016	2.66
04-27-2016	4.58
04-28-2016	4.57
04-29-2016	4.57
04-30-2016	4.73
05-01-2016	7.23
05-02-2016	6.32
05-03-2016	6.84
05-04-2016	7.51
05-05-2016	2.11
05-06-2016	5.05
05-07-2016	2.11
05-08-2016	5.43
05-09-2016	8.04
05-10-2016	2.39
05-11-2016	6.14
05-12-2016	9.68
Grand Total	5.13

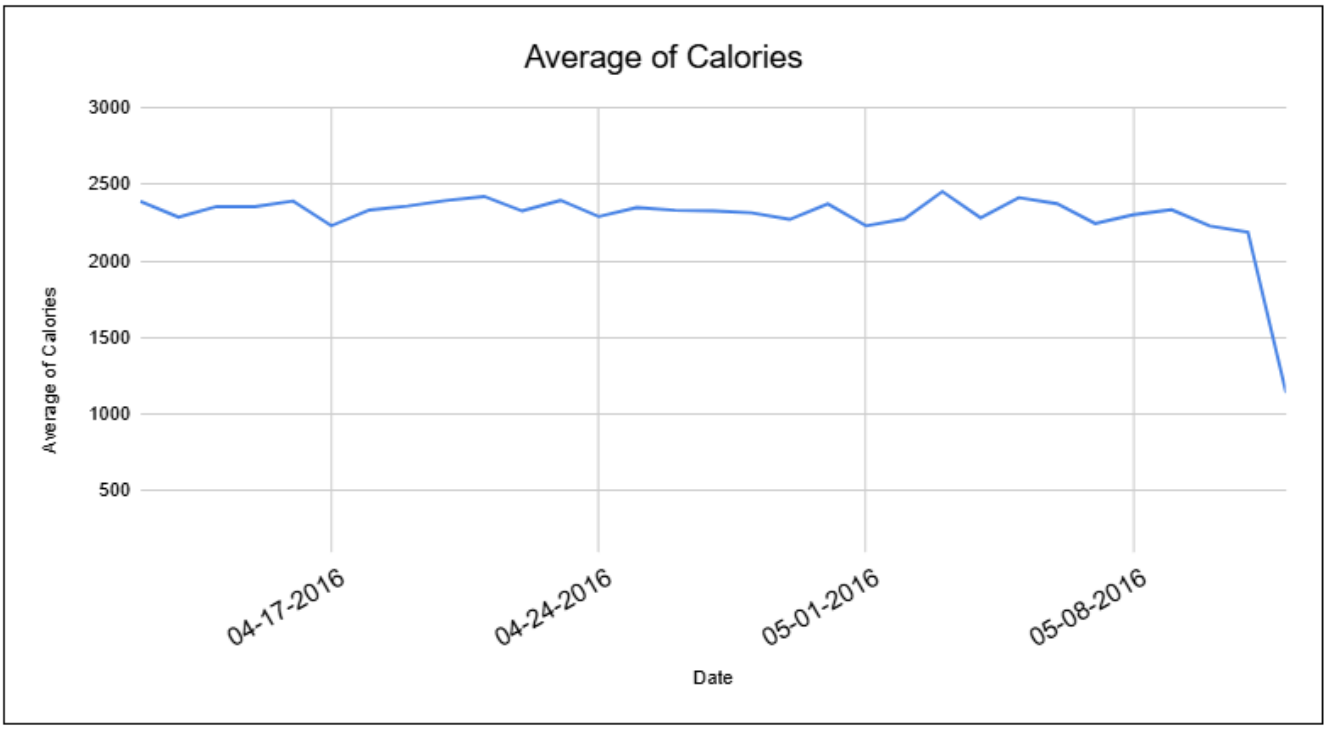
DateCleaned	AVERAGE of TotalHoursAsleep
04-12-2016	2.90
04-13-2016	3.04
04-14-2016	2.92
04-15-2016	3.67
04-16-2016	2.86
04-17-2016	2.90
04-18-2016	2.19
04-19-2016	2.98
04-20-2016	3.49
04-21-2016	2.94
04-22-2016	2.66
04-23-2016	3.36
04-24-2016	3.30
04-25-2016	2.48
04-26-2016	2.69
04-27-2016	3.12
04-28-2016	3.32
04-29-2016	3.02
04-30-2016	3.58
05-01-2016	3.78
05-02-2016	3.31
05-03-2016	2.74
05-04-2016	2.97
05-05-2016	2.49
05-06-2016	2.84
05-07-2016	3.03
05-08-2016	3.83
05-09-2016	2.83
05-10-2016	3.13
05-11-2016	3.35
05-12-2016	2.81
Grand Total	3.05

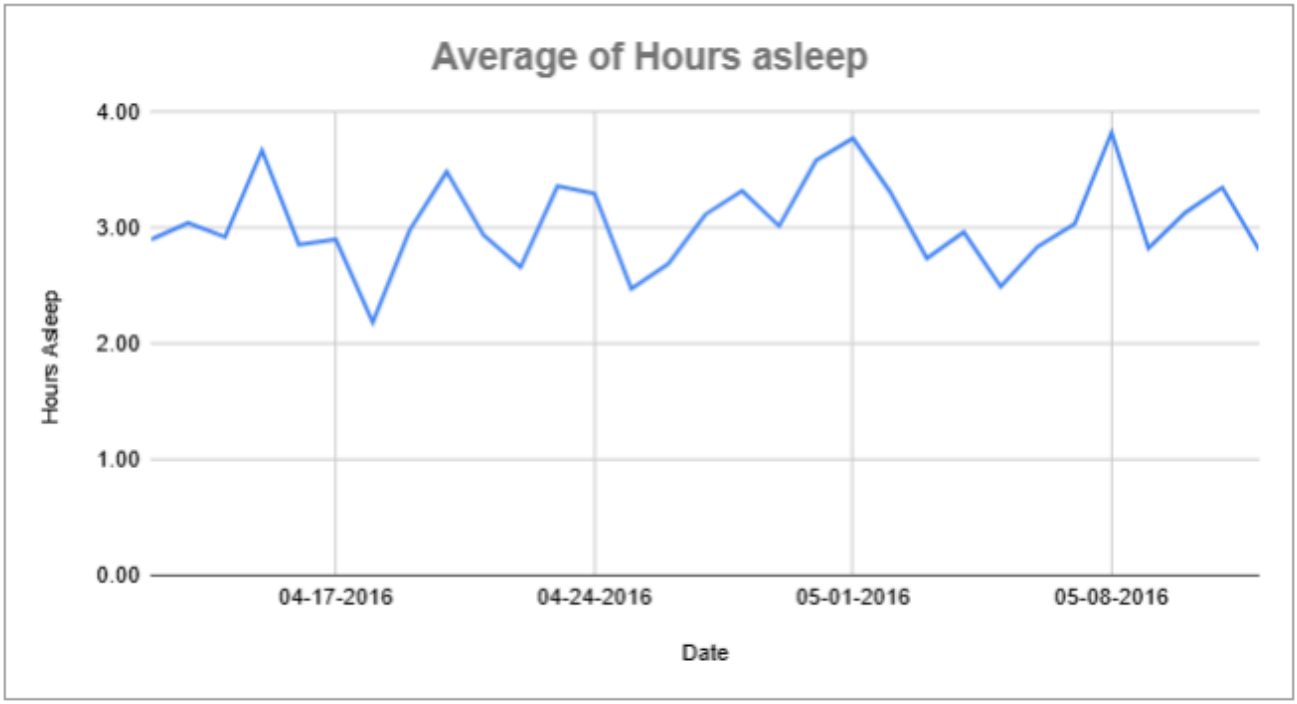
DateCleaned	AVERAGE of Calories
04-12-2016	2390.69697
04-13-2016	2286.636364
04-14-2016	2356.393939
04-15-2016	2355.181818
04-16-2016	2392.9375
04-17-2016	2230.96875
04-18-2016	2333.375
04-19-2016	2359.09375
04-20-2016	2395.21875
04-21-2016	2421.875
04-22-2016	2327.65625
04-23-2016	2397.15625
04-24-2016	2291.4375
04-25-2016	2349.5625
04-26-2016	2331.375
04-27-2016	2328.5625
04-28-2016	2316.0625
04-29-2016	2272.5625
04-30-2016	2373.935484
05-01-2016	2230.433333
05-02-2016	2275.448276
05-03-2016	2453.896552
05-04-2016	2283.137931
05-05-2016	2415.068966
05-06-2016	2375.068966
05-07-2016	2246.241379
05-08-2016	2303.444444
05-09-2016	2335.666667
05-10-2016	2229.346154
05-11-2016	2190.083333
05-12-2016	1139.285714
Grand Total	2303.609574

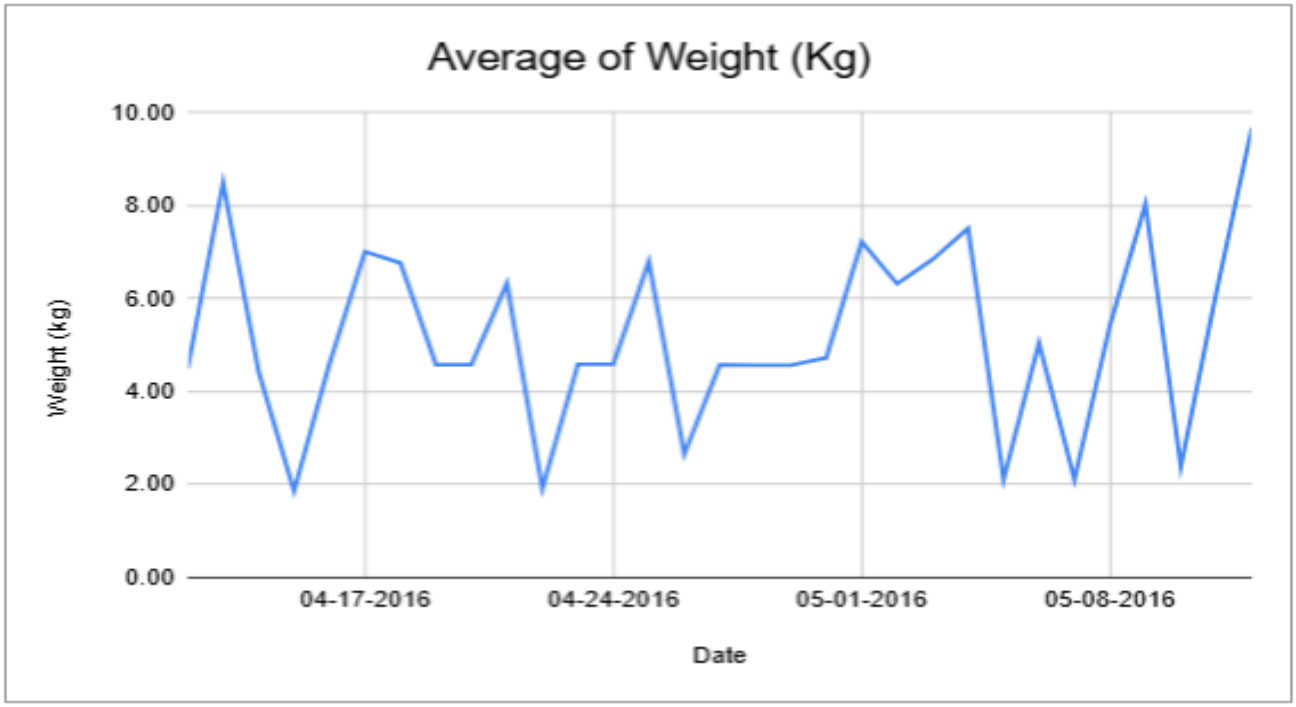
Visualizations

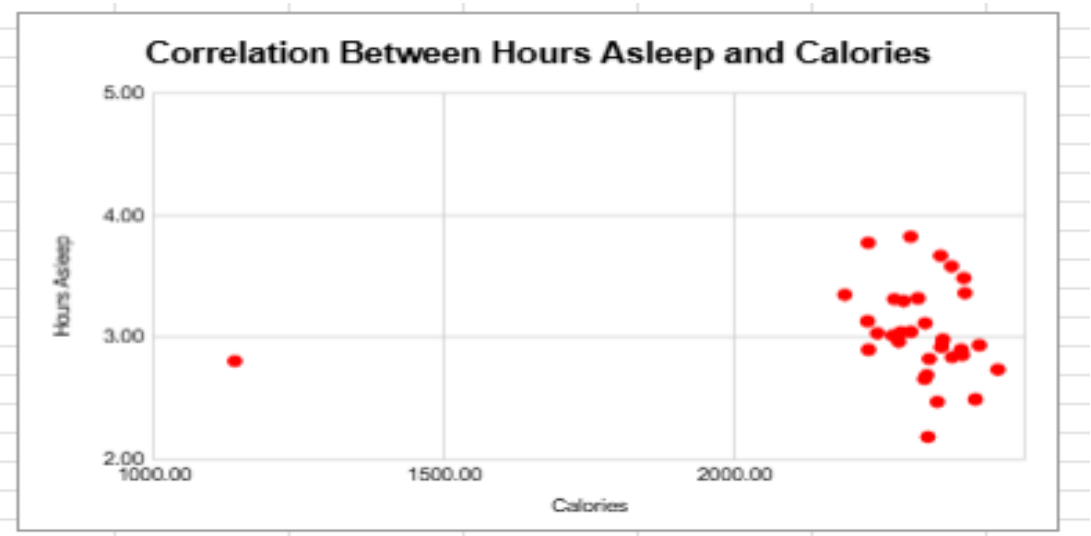
Visual charts were created to help stakeholders quickly understand the data trends:

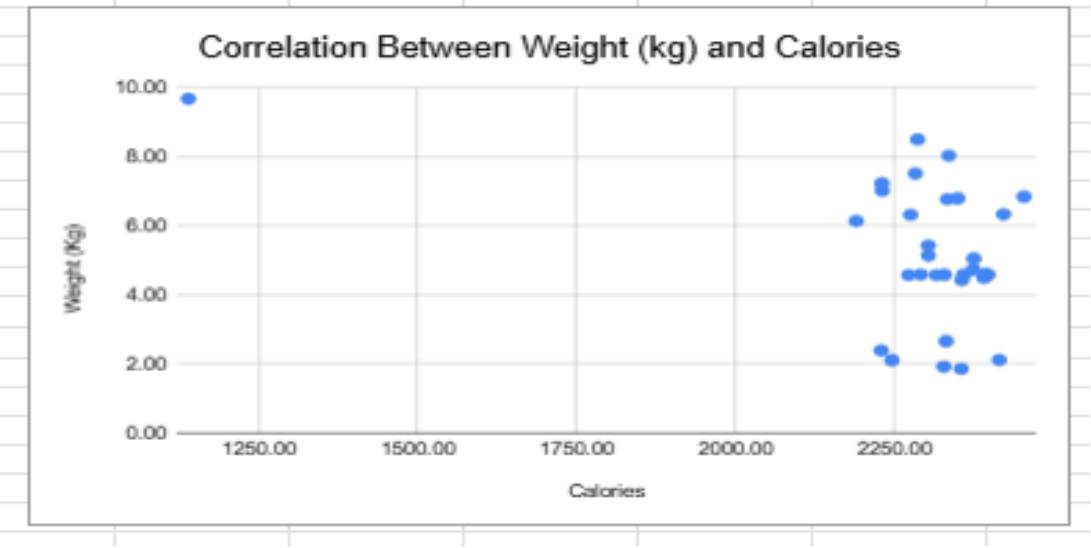
1. Average Calories per User – Bar chart showing calories burned across users.
2. Average Sleep Hours per User – Bar chart showing trends in sleep duration.
3. Average Weight per User – Bar chart showing weight distribution.
4. Scatter Plots – To illustrate relationships between sleep and weight, or calories and sleep.




Average of Hours asleep
4.00
3.00
2.00
1.00
0.00
Hours Asleep
04-17-2016
04-24-2016
05-01-2016
05-08-2016
Date


Average of Weight (Kg)
10.00
8.00
6.00
4.00
2.00
0.00
Weight (kg)
04-17-2016
04-24-2016
05-01-2016
05-08-2016
Date





8. Key Findings

- Sleep: Average sleep hours are lower than recommended, suggesting users may benefit from reminders or tips for better sleep habits, Users may be benefits from: bed time reminders, relaxation routines.
- Calories: Calories burned fluctuate daily, but averages are generally consistent across users.
- Weight: Weight remains mostly stable with minor variations, users either did not track weight frequently or the dataset contains incomplete or abbreviated weight information.
- Correlation: Weak correlation observed between calories, sleep, and weight.

Sleep and Calories: Users who sleep longer tend to burn slightly more calories the next day, indicating a weak but meaningful relationship between rest and activity levels.

Weight and calories: No strong correlation was detected, suggesting that weight data may be insufficient or recorded inconsistently.

Sleep and Weight: No meaningful relationship observed, likely due to limited weight entries.

9. Recommendations for Bellabeat product

Based on the observed trends, the following recommendations are proposed for the Bellabeat product:

1. Sleep Tracking: Provide users with reminders or tips to improve sleep duration.
2. Calories & Activity Engagement: Encourage wellness challenges and activity streaks based on calories burned trends.
3. Weight Monitoring: Display personalized insights on the app dashboard to help users track progress like weekly weight-insights summaries.
4. Marketing Strategies: Use insights on sleep and activity patterns to create targeted campaigns for engagement and retention

Conclusion & Next Steps

This analysis highlights general user behavior trends from non-Bellabeat smart device users. By applying these insights to the Bellabeat product, the company can enhance user engagement, improve product features, and inform marketing campaigns.

Next Steps:

- Include additional metrics, such as activity level and total time in bed, for a more comprehensive analysis.
- Explore longer periods of data to identify seasonal or long-term trends.
- Test recommendations with actual Bellabeat users to validate insights.