Summary

Screen time usage is becoming an increasingly significant part of modern lifestyles.

With the rise of smartphones, tablets, and computers in daily routines, we aim to understand how much time university students spend on electronic devices, as well as how this relates to their health, habits, and overall digital well-being. We also explore which days tend to have the highest screen time and which types of applications are used the most.

Group 6

6710545873	Vorapop Prasertkul
6710545521	Chaiyapat Kumtho
6710545741	Pasin Tongtip
6710545989	Amornrit Sirikham

Data Collection

Survey Questions

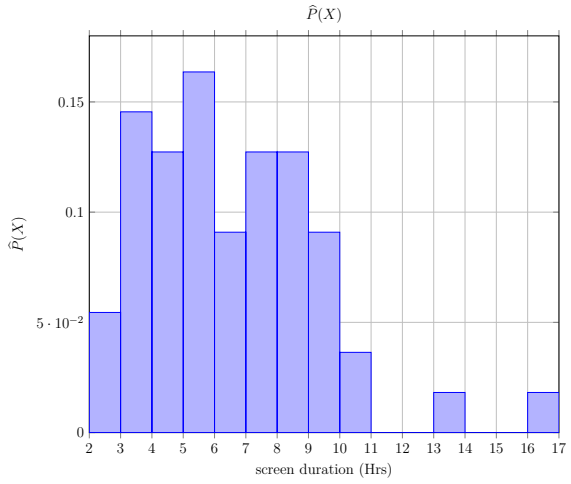
- Age
- Gender
- Weight (kilogram)
- Heart rate while answering the questionnaire (times)
- Average sleep time per day (approximately)
- Sunday Screen Time
- Monday Screen Time
- Tuesday Screen Time
- Wednesday Screen Time
- Thursday Screen Time
- Friday Screen Time
- Saturday Screen Time
- Most used application types
- Number of notifications on Sunday (times)
- Number of notifications on Monday (times)
- Number of notifications on Tuesday (times)
- Number of notifications on Wednesday (times)
- Number of notifications on Thursday (times)
- Number of notifications on Friday (times)
- Number of notifications on Saturday (times)
- Left eye health
  - Abnormality
    - If it's nearsightedness (Myopia)
      - How short sights?
    - Else if it's farsightedness (Presbyopia)
      - How long sights?
    - Else if it's compound vision (both nearsightedness and farsightedness)
      - How short sights?
      - How long sights?
  - Other eye disorders (multiple selection)
- Right eye health
  - Abnormality
    - If it's nearsightedness (Myopia)
      - How short sights?
    - Else if it's farsightedness (Presbyopia)
      - How long sights?
    - Else if it's compound vision (both nearsightedness and farsightedness)
      - How short sights?
      - How long sights?
  - Other eye disorders (multiple selection)

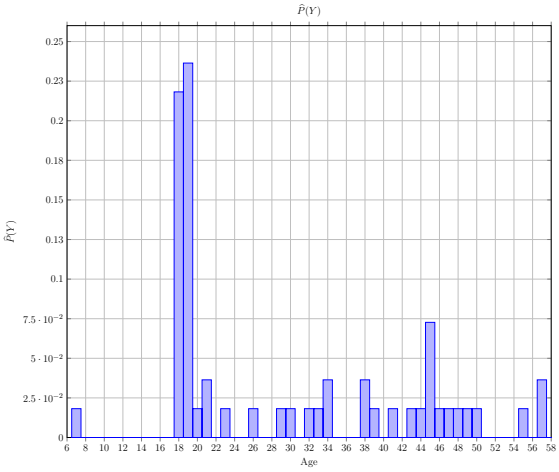
Methodology

Probability

Screen time vs Age

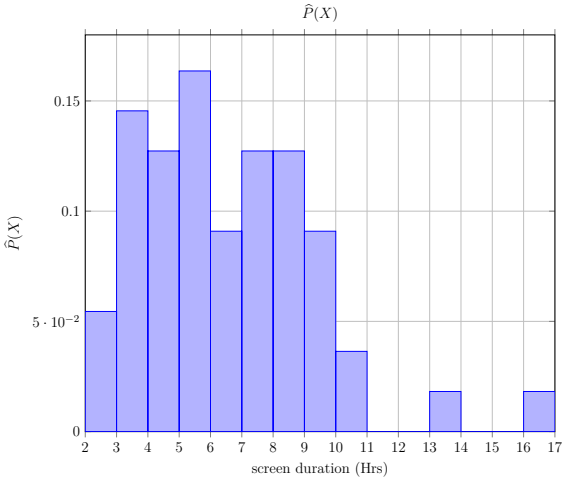
y \ x	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	$\widehat{P}(Y)$	$y \cdot \widehat{P}(Y)$
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
7	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.1273
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.0182	0.0545	0	0.0182	0	0.0182	0.0364	0.0545	0.0182	0	0	0	0	0	0	0.2182	3.9273
19	0	0	0.0364	0.0545	0.0364	0.0182	0.0182	0.0364	0.0182	0	0	0.0182	0	0	0	0.2364	4.4909
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.0182	0.3636
21	0	0	0	0	0	0.0182	0.0182	0	0	0	0	0	0	0	0	0.0364	0.7636
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.0182	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.4182
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0.0182	0	0	0	0	0	0	0	0	0	0	0.0182	0.4727
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.5273
30	0	0	0	0	0.0182	0	0	0	0	0	0	0	0	0	0	0.0182	0.5455
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.5818
33	0	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.6000
34	0	0	0	0	0	0.0364	0	0	0	0	0	0	0	0	0	0.0364	1.2364
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0.0182	0.0182	0	0	0	0	0	0	0	0	0	0	0	0.0364	1.3818
39	0	0	0	0	0	0.0182	0	0	0	0	0	0	0	0	0	0.0182	0.7091
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.7455
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.7818
44	0	0	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.8000
45	0	0	0	0.0182	0	0	0.0545	0	0	0	0	0	0	0	0	0.0727	3.2727
46	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.8364
47	0	0	0	0	0	0.0182	0	0	0	0	0	0	0	0	0	0.0182	0.8545
48	0.0182	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.8727
49	0	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.8909
50	0	0	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.9091
51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0	0	0.0182	0	0	0	0	0	0	0	0	0	0	0.0182	1.0000
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0.0182	0.0182	0	0	0	0	0	0	0	0	0	0	0	0	0.0364	2.0727
$\widehat{P}(X)$	0.0545	0.1455	0.1273	0.1636	0.0909	0.1273	0.1273	0.0909	0.0364	0	0	0.0182	0	0	0.0182	$\widehat{E}(X)$	6.53636
midpoint	2.5000	3.5000	4.5000	5.5000	6.5000	7.5000	8.5000	9.5000	10.5000	11.5000	12.5000	13.5000	14.5000	15.5000	16.5000	$\widehat{E}(Y)$	29.18182
mid $\cdot \widehat{P}(X)$	0.1364	0.5091	0.5727	0.9000	0.5909	0.9545	1.0818	0.8636	0.3818	0	0	0.2455	0	0	0.3000		

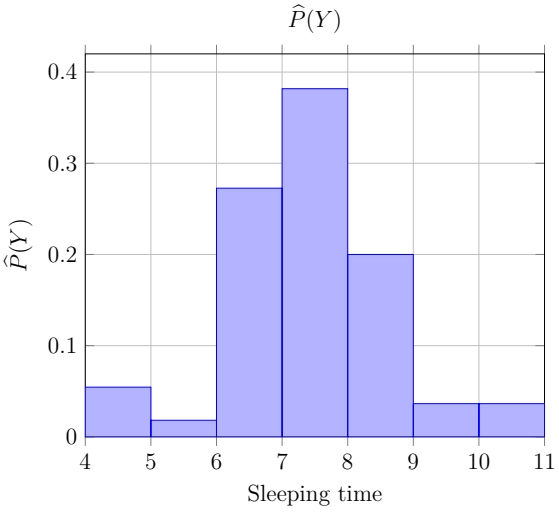




Screen time vs Sleeping time

x / y		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	$\widehat{P}(Y)$	midpoint	mid $\cdot \widehat{P}(Y)$
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
4	5	0	0	0	0	0	0	0	0.0364	0	0	0	0	0	0	0.0182	0.0545	4.5	0.2455
5	6	0	0	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0.0182	5.5	0.1000
6	7	0	0.0182	0.0182	0.0545	0.0545	0.0364	0.0545	0	0.0364	0	0	0	0	0	0	0.2727	6.5	1.7727
7	8	0.0182	0.0545	0.0909	0.0727	0.0364	0.0545	0.0545	0	0	0	0	0	0	0	0	0.3818	7.5	2.8636
8	9	0.0364	0.0545	0.0182	0.0182	0	0.0182	0.0182	0.0364	0	0	0	0	0	0	0	0.2000	8.5	1.7000
9	10	0	0.0182	0	0	0	0	0	0	0	0	0	0.0182	0	0	0	0.0364	9.5	0.3455
10	11	0	0	0	0	0	0.0182	0	0.0182	0	0	0	0	0	0	0	0.0364	10.5	0.3818
$\widehat{P}(X)$		0.0545	0.1455	0.1273	0.1636	0.0909	0.1273	0.1273	0.0909	0.0364	0	0	0.0182	0	0	0.0182			
midpoint		2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5		$\widehat{E}(X)$	6.5364
mid $\cdot \widehat{P}(X)$		0.1364	0.5091	0.5727	0.9000	0.5909	0.9545	1.0818	0.8636	0.3818	0	0	0.2455	0	0	0.3000		$\widehat{E}(Y)$	7.4091



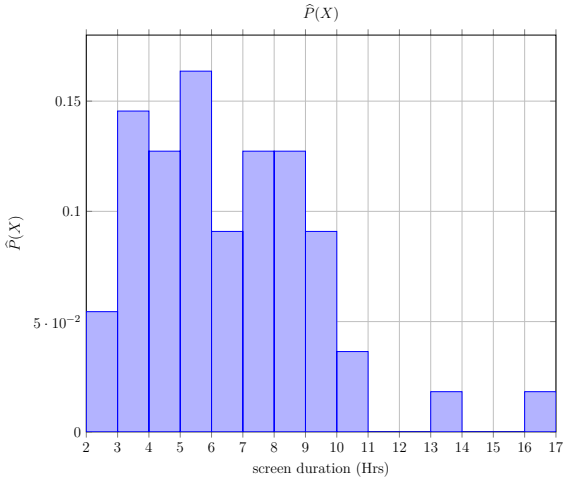


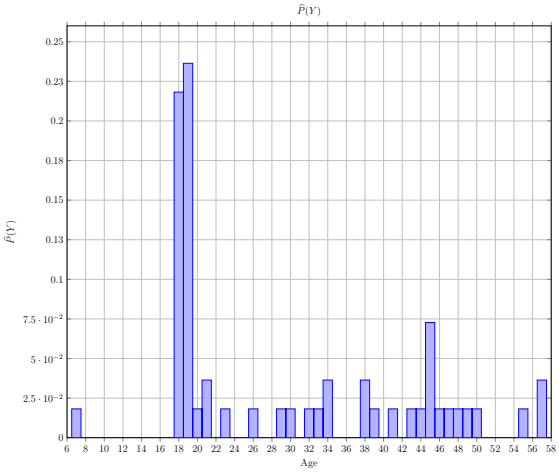
Screen time vs Notification

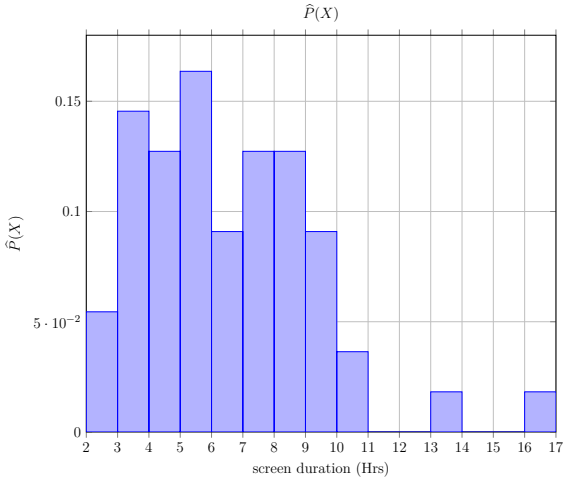
Screen time vs Heart rate

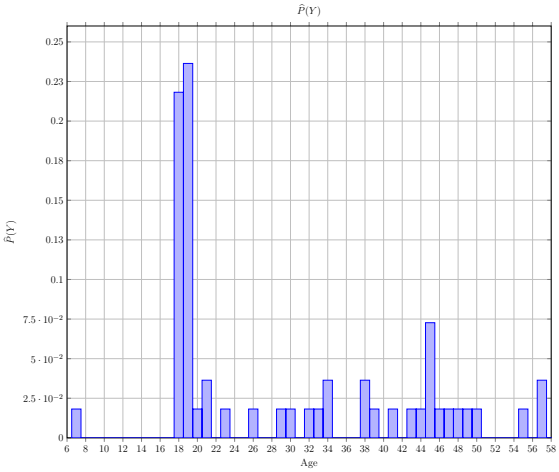
Screen time vs Weight

y \ x		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	$\widehat{P}(Y)$	midpoint	mid $\cdot\, \widehat{P}(Y)$
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
0	25	0.0182	0.0182	0.0182	0.0545	0	0	0	0	0	0	0	0	0	0	0	0.1091	12.5	1.3636
25	50	0	0	0.0182	0	0.0182	0.0545	0.0182	0	0.0182	0	0	0.0182	0	0	0	0.1455	37.5	5.4545
50	75	0.0182	0.0182	0	0.0364	0	0	0.0364	0	0	0	0	0	0	0	0	0.1091	62.5	6.8182
75	100	0.0182	0.0545	0.0182	0.0364	0.0364	0	0	0.0182	0	0	0	0	0	0	0.0182	0.2000	87.5	17.5000
100	125	0	0.0364	0.0182	0.0182	0.0182	0.0182	0	0.0182	0	0	0	0	0	0	0	0.1273	112.5	14.3182
125	150	0	0	0.0182	0	0	0	0.0182	0.0364	0	0	0	0	0	0	0	0.0727	137.5	10.0000
150	175	0	0	0	0	0	0.0545	0	0	0.0182	0	0	0	0	0	0	0.0727	162.5	11.8182
175	200	0	0	0.0182	0	0	0	0.0364	0	0	0	0	0	0	0	0	0.0545	187.5	10.2273
200	225	0	0.0182	0.0182	0	0	0	0	0.0182	0	0	0	0	0	0	0	0.0545	212.5	11.5909
225	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	237.5	0
250	275	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	262.5	0
275	300	0	0	0	0.0182	0	0	0.0182	0	0	0	0	0	0	0	0	0.0364	287.5	10.4545
300	325	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	312.5	0
325	350	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	337.5	0
350	375	0	0	0	0	0.0182	0	0	0	0	0	0	0	0	0	0	0.0182	362.5	6.5909
$\widehat{P}(X)$		0.0545	0.1455	0.1273	0.1636	0.0909	0.1273	0.1273	0.0909	0.0364	0	0	0.0182	0	0	0.0182			
midpoint		2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5		$\widehat{E}(X)$	106.1364
mid $\cdot\, \widehat{P}(X)$		0.1364	0.5091	0.5727	0.9	0.5909	0.9545	1.0818	0.8636	0.3818	0	0	0.2455	0	0	0.3000		$\widehat{E}(Y)$	6.5364



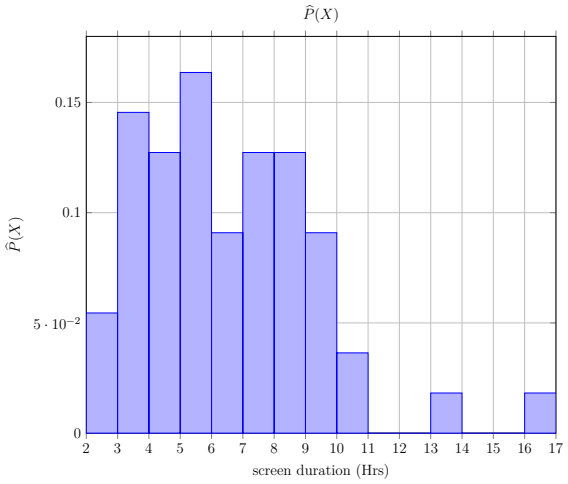


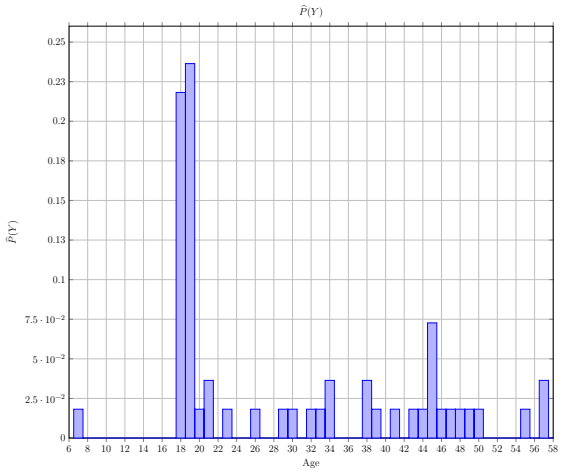




y \ x		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	$\widehat{P}(Y)$	midpoint	mid $\cdot \widehat{P}(Y)$
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
50	55	0	0	0	0	0	0	0.0182	0	0	0	0	0	0	0	0	0.0182	52.5	0.9545
55	60	0	0.0182	0	0	0	0.0182	0	0.0182	0	0	0	0	0	0	0	0.0545	57.5	3.1364
60	65	0	0	0.0182	0	0	0.0364	0	0	0	0	0	0	0	0	0	0.0545	62.5	3.4091
65	70	0	0	0	0	0.0182	0.0182	0.0182	0.0182	0	0	0	0	0	0	0	0.0727	67.5	4.9091
70	75	0	0.0182	0	0.0182	0.0182	0	0	0.0182	0	0	0	0	0	0	0	0.0727	72.5	5.2727
75	80	0	0.0364	0.0182	0	0	0	0	0	0	0	0	0	0	0	0	0.0545	77.5	4.2273
80	85	0.0182	0.0545	0.0364	0.0364	0.0182	0.0182	0.0182	0.0182	0	0	0	0	0	0	0	0.2182	82.5	18.0000
85	90	0.0182	0.0182	0.0364	0.0545	0.0364	0.0364	0.0545	0.0182	0.0182	0	0	0	0	0	0	0.2909	87.5	25.4545
90	95	0	0	0	0.0364	0	0	0.0182	0	0	0	0	0	0	0	0	0.0545	92.5	5.0455
95	100	0.0182	0	0	0	0	0	0	0	0	0	0	0.0182	0	0	0	0.0364	97.5	3.5455
100	105	0	0	0.0182	0	0	0	0	0	0.0182	0	0	0	0	0	0	0.0364	102.5	3.7273
105	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0182	0.0182	107.5	1.9545
110	115	0	0	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0.0182	112.5	2.0455
$\widehat{P}(X)$		0.0545	0.1455	0.1273	0.1636	0.0909	0.1273	0.1273	0.0909	0.0364	0	0	0.0182	0	0	0.0182			
midpoint		2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5		$\widehat{E}(X)$	6.5364
mid $\cdot \widehat{P}(X)$		0.1364	0.5091	0.5727	0.9	0.5909	0.9545	1.0818	0.8636	0.3818	0	0	0.2455	0	0	0.3000		$\widehat{E}(Y)$	81.6818

y \ x		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	$\widehat{P}(Y)$	midpoint	mid $\cdot \widehat{P}(Y)$
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
25	35	0	0.0182	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0182	30	0.5455
35	45	0	0	0	0	0	0	0.0182	0	0	0	0	0	0	0	0	0.0182	40	0.7273
45	55	0	0.0909	0	0.0545	0.0182	0.0364	0.0182	0.0182	0	0	0	0	0	0	0.0182	0.2545	50	12.7273
55	65	0.0364	0.0182	0.0545	0.0727	0	0.0545	0.0727	0.0545	0.0182	0	0	0.0182	0	0	0	0.4	60	24.
65	75	0.0182	0	0.0364	0.0182	0.0364	0.0182	0	0.0182	0	0	0	0	0	0	0	0.1455	70	10.1818
75	85	0	0	0.0182	0	0.0364	0.0182	0.0182	0	0	0	0	0	0	0	0	0.0909	80	7.2727
85	95	0	0.0182	0.0182	0.0182	0	0	0	0	0	0	0	0	0	0	0	0.0545	90	4.9091
95	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
105	115	0	0	0	0	0	0	0	0	0.0182	0	0	0	0	0	0	0.0182	110	2.
$\widehat{P}(X)$		0.0545	0.1455	0.1273	0.1636	0.0909	0.1273	0.1273	0.0909	0.0364	0	0	0.0182	0	0	0.0182			
midpoint		2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5		$\widehat{E}(X)$	6.5364
mid $\cdot \widehat{P}(X)$		0.1364	0.5091	0.5727	0.9	0.5909	0.9545	1.0818	0.8636	0.3818	0	0	0.2455	0	0	0.3000		$\widehat{E}(Y)$	62.3636





Statistics

Descriptive Statistics

		Age	Weight (kg)	Heart Rate	Sleeping time (Hrs)	Average daily screen time (Hrs)	Average daily notification received
Count		55	55	55	55	55	55
Measure of Centrality	MEAN	29.182	61.97090909	80.89090909	7.310	6.577	103.751
	median	21.000	60	83	7.342	6.202	86.000
	mode	19	62.2	87	7.5	6.202380952	86
Measure of Dispersion	MIN	7.000	25.7	51	4.500	2.236	6.429
	MAX	57.000	111.1	111	10.533	16.671	357.000
	range	50.000	85.400	60.000	6.033	14.436	350.571
	variance	175.4478	194.3140	168.4323	1.4176	7.9495	5585.474088
	SD	13.2457	13.9397	12.9781	1.1906	2.8195	74.7360
	cv	0.4539	0.2249	0.1604	0.1629	0.4287	0.7203
	MAD	11.7752	9.9298	9.9451	0.8687	2.2193	56.00727273
	quartile1 (Q1)	19	52.5	73	6.5	4.569047619	49.14285714
	quartile3 (Q3)	43	67	88	8	8.316666667	146.7142857
	IQR	24	14.5	15	1.5	3.747619048	97.57142857
Outliers	Q1-1.5IQR	-17	30.75	50.5	4.25	-1.052380952	-97.21428571
	Q3+1.5IQR	79	88.75	110.5	10.25	13.93809524	293.0714286
	Outliers (based on IQR) If no outlier, answer None.	None	25.7, 93, 111.1	111	10.417, 10.533	16.671	294.857, 357.000
	MEAN-3SD	-10.5552	20.1519	41.9565	3.7379	-1.8814	-120.4574
	MEAN+3SD	68.9188	103.7899	119.8254	10.8818	15.0355	327.9587
	Outliers (based on SD) If no outlier, answer None.	None	111.1	None	None	16.671	357.000
	Mean after removing outliers based on IQR. If no outlier, type NA	NA	61.12692308	80.3333	7.1904	6.3901	95.367
	SD after removing outliers based on IQR. If no outlier, type NA	NA	10.63094107	12.4173	1.0355	2.4782	61.58689353

Goodness of Fit test

1. **Data set : Average screen duration**

   Type of distribution : Normal distribution

   Known parameter : 0

   Unknown parameter (m) : 2, which are μ, σ

   H_0 : Screen duration is normally distributed with $\mu = 6.5771$ and $\sigma = 2.8195$

   H_a : Screen duration is not normally distributed with $\mu = 6.5771$ and $\sigma = 2.8195$

   Number of cells with the expected number of samples (k) : 7

   Test static $\chi^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i} = 2.1452$

   Significant level (α) : 0.05

   Degree of freedom 1 (ν_1) : $k - 1 - m = 7 - 1 - 2 \Rightarrow 4$

   Cutoff of non-rejection region : 9.4877

   Degree of freedom 2 (ν_2) : $k - 1 = 7 - 1 \Rightarrow 6$

   Cutoff of rejection region : 12.592

   Non-rejection regions : $\chi^2 < \chi^2_{0.05,4} = 9.4877$

   Rejection regions : $\chi^2 \geq \chi^2_{0.05,6} = 12.592$

   Rejection decision : Don't need to reject null hypothesis

   Conclusion : Screen duration is normally distributed with $\mu = 6.5771$ and $\sigma = 2.8195$

2. **Data set : Average Sleeping Duration**

Type of distribution : Normal distribution

Known parameter : 0

Unknown parameter (m) : 2, which are μ, σ

H_0 : Screen duration is normally distributed with $\mu = 7.3098$ and $\sigma = 1.1906$

H_a : Screen duration is not normally distributed with $\mu = 7.3098$ and $\sigma = 1.1906$

Number of cells with the expected number of samples (k) : 4

Test static $\chi^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i} = 2.2647$

Significant level (α) : 0.05

Degree of freedom 1 (ν_1) : $k - 1 - m = 4 - 1 - 2 \Rightarrow 1$

Cutoff of non-rejection region : 3.8415

Degree of freedom 2 (ν_2) : $k - 1 = 4 - 1 \Rightarrow 3$

Cutoff of rejection region : 7.8147

Non-rejection regions : $\chi^2 < \chi^2_{0.05,1} = 3.8415$

Rejection regions : $\chi^2 \geq \chi^2_{0.05,3} = 7.8147$

Rejection decision : Don't need to reject null hypothesis

Conclusion : Screen duration is normally distributed with $\mu = 7.3098$ and $\sigma = 1.1906$

3. **Data set : Weight**

Type of distribution : Normal distribution

Known parameter : 0

Unknown parameter (m) : 2, which are μ, σ

H_0 : Screen duration is normally distributed with $\mu = 61.9709$ and $\sigma = 13.9397$

H_a : Screen duration is not normally distributed with $\mu = 61.9709$ and $\sigma = 13.9397$

Number of cells with the expected number of samples (k) : 7

Test static $\chi^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i} = 7.6892$

Significant level (α) : 0.05

Degree of freedom 1 (ν_1) : $k - 1 - m = 7 - 1 - 2 \Rightarrow 4$

Cutoff of non-rejection region : 9.4877

Degree of freedom 2 (ν_2) : $k - 1 = 7 - 1 \Rightarrow 6$

Cutoff of rejection region : 12.592

Non-rejection regions : $\chi^2 < \chi^2_{0.05,4} = 9.4877$

Rejection regions : $\chi^2 \geq \chi^2_{0.05,6} = 12.592$

Rejection decision : Don't need to reject null hypothesis

Conclusion : Screen duration is normally distributed with $\mu = 61.9709$ and $\sigma = 13.9397$

4. **Data set : Average Notification**

Type of distribution : Normal distribution

Known parameter : 0

Unknown parameter (m) : 2, which are μ, σ

H_0 : Screen duration is normally distributed with $\mu = 103.7506$ and $\sigma = 74.7360$

H_a : Screen duration is not normally distributed with $\mu = 103.7506$ and $\sigma = 74.7360$

Number of cells with the expected number of samples (k) : 7

Test static $\chi^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i} = 3.5875$

Significant level (α) : 0.05

Degree of freedom 1 (ν_1) : $k - 1 - m = 7 - 1 - 2 \Rightarrow 4$

Cutoff of non-rejection region : 9.4877

Degree of freedom 2 (ν_2) : $k - 1 = 7 - 1 \Rightarrow 6$

Cutoff of rejection region : 12.592

Non-rejection regions : $\chi^2 < \chi^2_{0.05,4} = 9.4877$

Rejection regions : $\chi^2 \geq \chi^2_{0.05,6} = 12.592$

Rejection decision : Don't need to reject null hypothesis

Conclusion : Screen duration is normally distributed with $\mu = 103.7506$ and $\sigma = 74.7360$

Hypothesis Test

1. **Data set : Average screen duration**

Test hypothesis claims that *average screen duration* is greater than 7 Hrs.
Collect data from 55 people. Sample mean sample standard deviation : 6.5771 & 2.8195 Hrs respectively.

Case of Hypothesis test : Large sample size

Upper-tailed, lower-tailed or two-tailed test : upper-tailed

7 steps test

1.1 Parameter : μ

1.2 μ = average screen duration

1.3

$$\begin{aligned} \mu &: \text{average screen duration} \\ \mu_0 &: 7 \\ H_0 &: \mu = 7 \end{aligned} \tag{1}$$

1.4

$$H_a : \mu > 7 \tag{2}$$

1.5

$$\begin{aligned} z &= \frac{X - \mu_0}{\frac{S}{\sqrt{n}}} \\ &= \frac{6.5771 - 7}{\frac{2.8195}{\sqrt{55}}} \\ &= -1.11236 \end{aligned} \tag{3}$$

1.6

$$\begin{aligned} \alpha &: 0.05 \\ 1-\alpha = 1-0.05 &= 0.95 \\ z_a = z_{0.05} &= 1.6449 \\ z &\geq 1.6449 \end{aligned} \tag{4}$$

1.7 Rejection decision

Test static does not fall inside the rejection region.Null hypothesis is not rejected.

1.8 Conclusion

We do not reject the null hypothesis. Average screen duration is 7 Hrs.

2. **Data set : Average notification**

Conclusion

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetuer.

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas

vel, odio.

Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sed justo eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.

Appendix

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetuer.

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas

vel, odio.

Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sed justo eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.