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SCHOOL OF PROFESSIONAL AND CONTINUING EDUCATION (SPACE)

GROUP ASSIGNMENT
FEB 2020

SUBJECT CODE : FSPM 0034

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SECTION: 13

GROUP: 07

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DURATION : 3 WEEKS

SUBMISSION DATE : 20TH FEB 2020

ANALYSIS ON UTMSPACE FOUNDATION SESSION 2019/2020 STUDENTS' SPENDING ON FOOD

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20 February 2020

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Abstract

This study investigate the foundation students' spending on food. Information on weekly food expenditures from a sample of students was used to estimate the student's weight, height and parents' income. It is said that their food expenditures are related to their weight, height and parents' income.

Analysis on UTMSPACE Foundation

Session 2019/2020 Students'

Spending on Food

Section I

Introduction to the Study

Statement of the Problem

The purpose of this study was to determine the student's weight, height, spending on food weekly and parents' income.

Scope of the Study

This study is limited to the selected UTMSPACE foundation session 2019/2020 students in UTM, Skudai, Johor only as to the student's weight, height, spending on food weekly and parents' income. Data for the study were collected during earlier of 2020.

Methods of the Study

Source of Data

Data for this study were collected using Google form developed by the students of Group 7 from Section 13 at University Technology Malaysia. The form contained 5 simple questions. Respondents were asked to indicate their sections whether they are from Section 13 or Section 18 in the first question. They were also asked to indicate their weight range and height range listed in the following second and third question. Then, they were required to indicate their spending on food per week in the 4th question. Lastly, they were asked to indicate their parents' monthly income.

Sample of Selection

The respondents involved in the survey were Section 13 and Section 18. The member who create the Google form was responsible for distributing the form.

Statistical Techniques

Simple statistical techniques were used to tabulate the results of this study. The responses of each respondents were recorded systematically in the "individual" section of the Google form. The frequency of weight range, height range, spending on food per week and parents' income based on different section are counted manually by two members who were responsible in analysing data.

Limitations of the Study

The study may be limited through the use of a form as a data collection instrument. Because the form was generally be brief, some of weight range, height range, spending on food per week and parents' income may not have been included in the form. The sample of students for the study was chosen for

convenience and may not be representative of the total population of UTMSPACE foundation session 2019/2020 students.

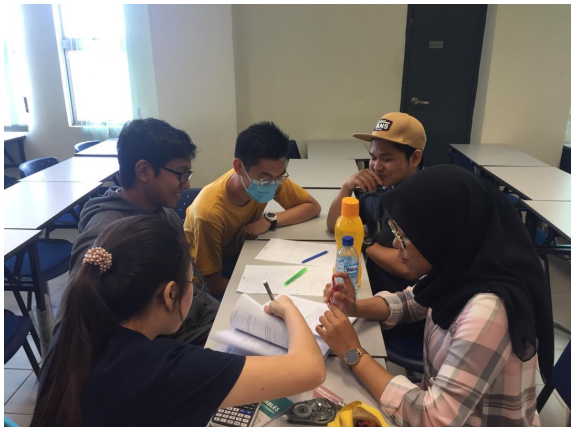
Procedures

JAN 20	Time : 8.00am – 10.00am Place : BK 3-1, T06 Attendance : Nurin Irdina binti Azizi Bernard Loh Adam Hakim bin Mohamad Rodzi Khairul Nor Azreen bin Khairul Anuar Kong Jia Rou Discussion : Analyzing topic, meeting with lecturer, distribution of task and role Meeting 1 All members were gathered to discuss a strategic plan to complete the assignment. The topic given by the lecturer, Madam Aaishah Radziah binti Jamaludin was analyzed. The members met the lecturer to discuss questions about the assignment. Each group members were selected and given a role under the agreement of every group members, Nurin Irdina binti Azizi as the leader of the group, Bernard Loh as the problem solver, Adam Hakim bin Mohamad Radzi as the collaborator, Khairul Nor Azreen bin Khairul Anuar as the checker and Kong Jia Rou as reporter. Nurin Irdina distributed the tasks to all group members. Jia Rou would be responsible to create a Google form to collect the data of the survey. Azreen would help to distribute the Goggle form to the respondents through social media. Bernard and Adam Hakim would compile the data after the data was collected. 
JAN 24	Google form was created and distributed to the respondents. The survey was opened for respond until 30 responses were collected from section 13 and section 18 respectively.
FEB 05	Time : 2.30pm – 5.00pm Place : T06 Attendance : Nurin Irdina binti Azizi Bernard Loh

Adam Hakim bin Mohamad Rodzi
Khairul Nor Azreen bin Khairul Anuar
Kong Jia Rou

Discussion : Analyzing and compiling data, report drafting and writing

Meeting 2
All the data were collected. Bernard and Adam Hakim compiled and analyzed the data by calculating the frequency of the weight range, height range, spending on food per week and parents' income. Azreen calculated the measure of tendency and the measure of dispersion. Nurin Irdina tabulated the analyzed data and presented all the data using graphical method. Jia Rou gathered the information to make a draft of the report, then evaluated it in the form of formal report.

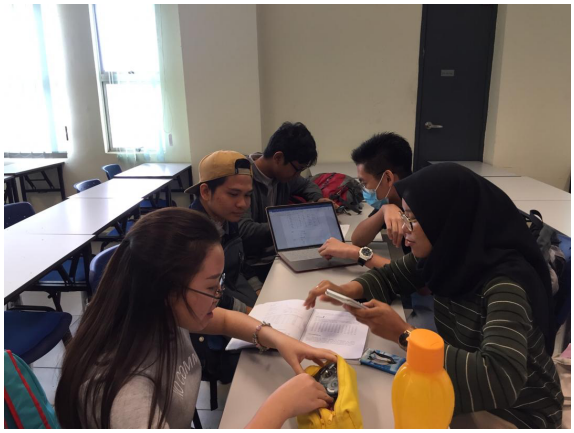


FEB 12

Time : 12.00pm – 2.00pm
Place : T06
Attendance : Nurin Irdina binti Azizi
Bernard Loh
Adam Hakim bin Mohamad Rodzi
Khairul Nor Azreen bin Khairul Anuar
Kong Jia Rou

Discussion : Editing and proofreading report

Meeting 3
All group members were given a softcopy of the report to recheck, approve the content and make upgrade to the structure. The report was read again to check the spelling and language structure.



Section II

The Presentation of Data

Findings

The findings will be presented in bar chart and pie chart for Section 13 and Section 18 respectively according to the following characteristics: weight, height, spending on food weekly, parents' monthly income.

Section 13

Weight

The respondents from Section 13 were asked to indicate their weight; all weight were represented in the results, as shown in Table 1 and Figure 1. The frequency of the weight in range (30-39)kg, (40-49)kg, (50-59)kg, (60-69)kg, (70-79)kg and (80-89)kg are 1, 9, 9, 7, 0, 4 and 0 respectively.

Weight (kg)	Frequency
30-39	1
40-49	9
50-59	9
60-69	7
70-79	0
80-89	4
90-99	0

Table 1: Table of Weight and Frequency

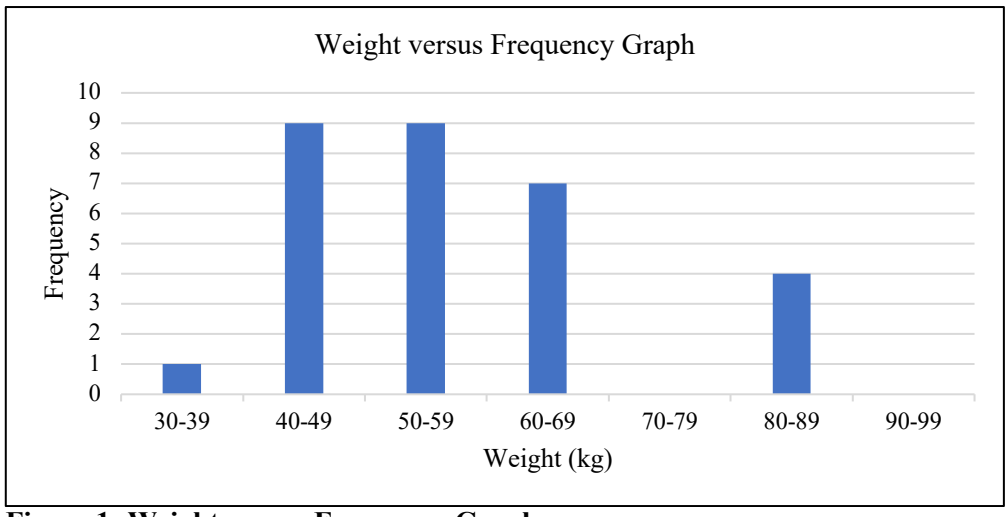


Figure 1: Weight versus Frequency Graph

Height

The respondents from Section 13 were asked to indicate their height; all height were represented in the results, as shown in Table 2 and Figure 2. The frequency of the height in range (145-149)cm, (150-

154)cm, (155-159)cm, (160-164)cm, (165-169)cm, (170-174)cm, (175-179)cm, (180-184)cm and (185-189)cm are 4, 4, 1, 6, 6, 2, 3, 2 and 2 respectively.

Height (cm)	Frequency
145-149	4
150-154	4
155-159	1
160-164	6
165-169	6
170-174	2
175-179	3
180-184	2
185-189	2

Table 2: Table of Height and Frequency

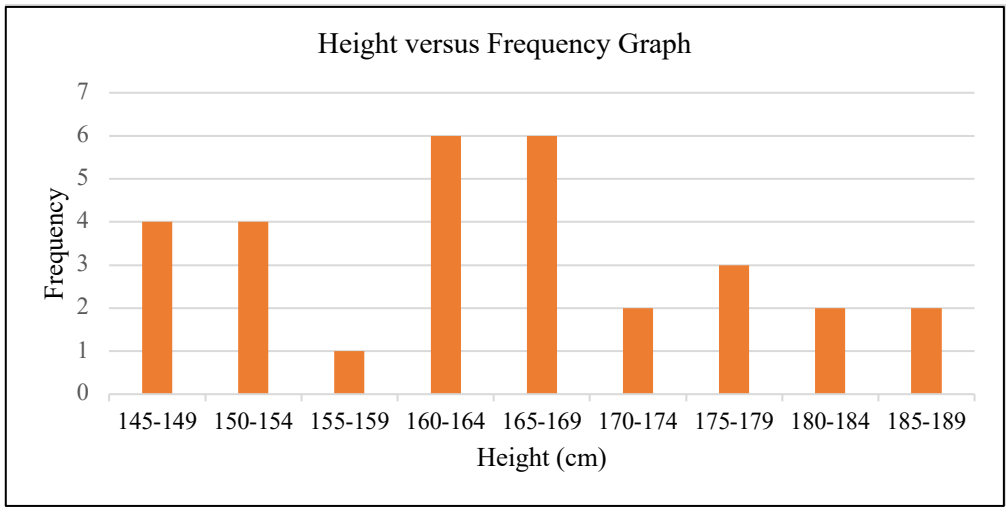


Figure 2: Height versus Frequency Graph

Spending on food weekly

The respondents from Section 13 were asked to indicate their spending on food weekly; all spending on food weekly were represented in the results, as shown in Table 3 and Figure 3. The frequency of the spending on food weekly in range RM(50-54), RM(55-59), RM(60-64), RM(65-69), RM(70-74), RM(75-79), RM(80-84), RM(85-89), RM(90-94), RM(95-99), RM(100-104), RM(105-109), RM(110-114), RM(115-119), RM(120-124), RM(125-129), RM(130-139) and RM(140-144) are 5, 8, 2, 1, 2, 3, 1, 2, 0, 1, 2, 1, 0, 0, 0, 0, 0 and 2 respectively.

Spending on food (RM)	Frequency
50-54	5
55-59	8
60-64	2
65-69	1
70-74	2
75-79	3
80-84	1

85-89	2
90-94	0
95-99	1
100-104	2
105-109	1
110-114	0
115-119	0
120-124	0
125-129	0
130-139	0
140-144	2

Table 3: Table of Spending on food and Frequency

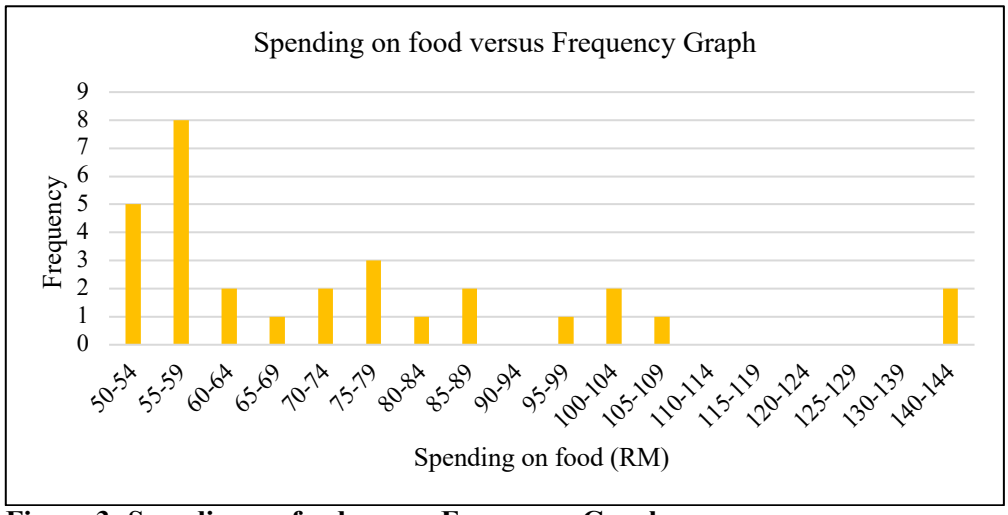


Figure 3: Spending on food versus Frequency Graph

Parents' Monthly Income

The respondents from Section 13 were asked to indicate their parents' monthly income; all parents' income were represented in the results, as shown in Table 4 and Figure 4. The frequency of the parents' monthly income in range RM(3001-4000), RM(4001-5000), RM(5001-6000), RM(6001-7000), RM(7001-8000), RM(8001-9000), RM(9001-10000), RM(10001-11000) and RM(11001-12000) are 11, 2, 1, 3, 2, 2, 1, 1 and 7 respectively.

Parents' monthly Income (RM)	Frequency
3001 - 4000	11
4001 - 5000	2
5001 - 6000	1
6001 - 7000	3
7001 - 8000	2
8001 - 9000	2
9001 - 10000	1
10001 - 11000	1
11001 - 12000	7

Table 4: Table of Parents' Monthly Income

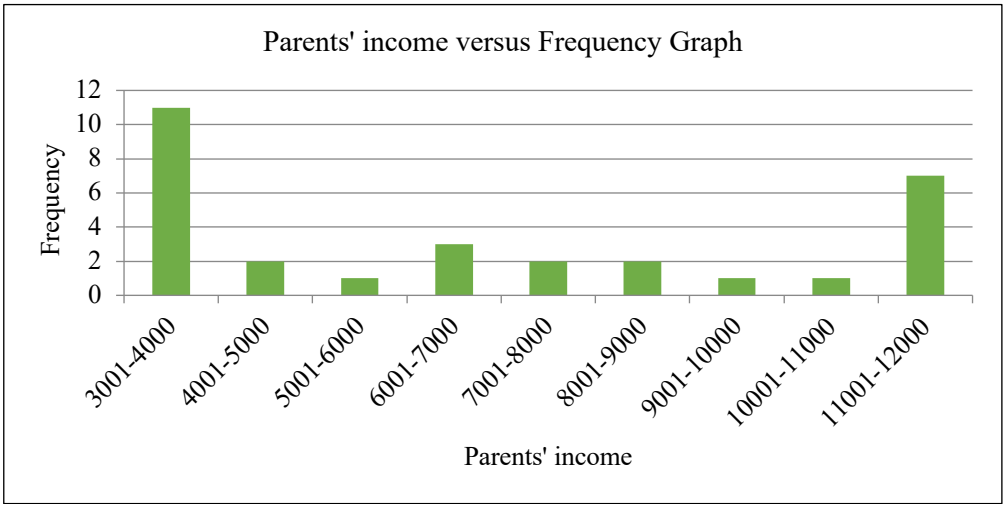


Figure 4: Parents' income versus Frequency Graph

Section 18

Weight

The respondents from Section 18 were asked to indicate their weight; all weight were represented in the results, as shown in Table 5 and Figure 5. The percentage of the weight in range (30-39)kg, (40-49)kg, (50-59)kg, (60-69)kg, (70-79)kg, (80-89)kg, (90-99)kg and (100-199)kg are 0%, 6%, 50%, 17%, 10%, 7%, 0% and 10% respectively.

Weight (kg)	Frequency
30-39	0
40-49	2
50-59	15
60-69	5
70-79	3
80-89	2
90-99	0
100-199	3

Table 5: Table of Weight and Frequency

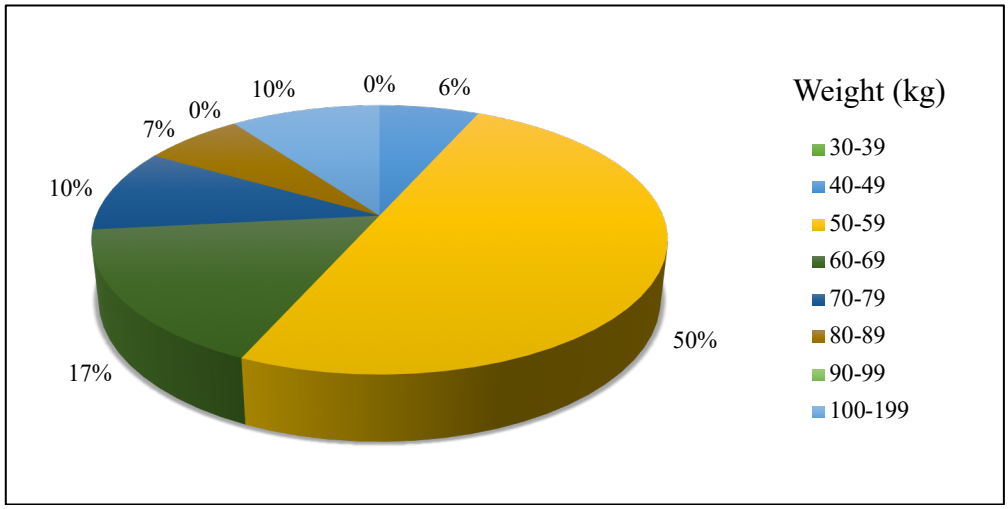


Figure 5: Weight Pie Chart

Height

The respondents from Section 18 were asked to indicate their height; all height were represented in the results, as shown in Table 6 and Figure 6. The percentage of the height in range (150-154)cm, (155-159)cm, (160-164)cm, (165-169)cm, (170-174)cm, (175-179)cm, (180-184)cm and (185-189)cm are 20%, 30%, 14%, 13%, 3%, 10%, 3% and 7% respectively.

Height (cm)	Frequency
150-154	6
155-159	9
160-164	4
165-169	4
170-174	1

175-179	3
180-184	1
185-189	2

Table 6: Table of Height and Frequency

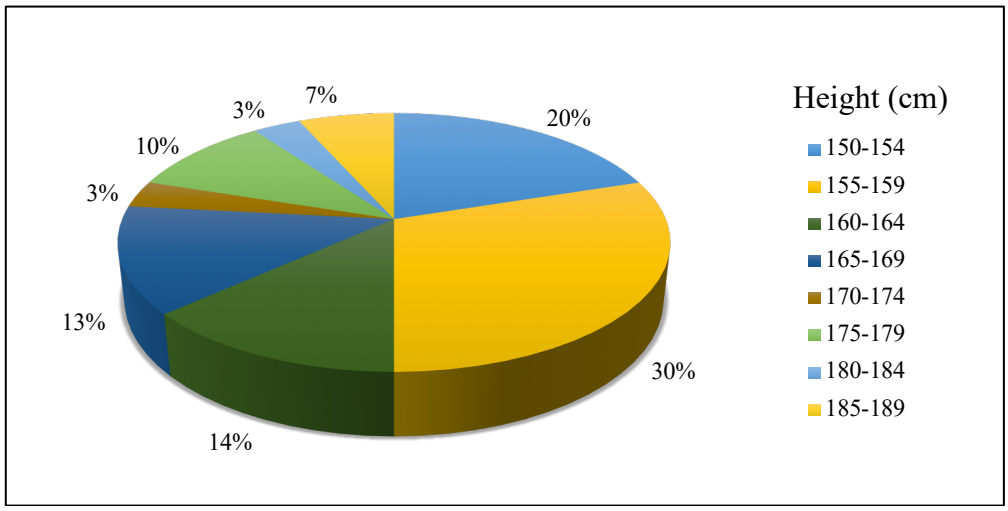


Figure 6: Height Pie Chart

Spending on Food Weekly

The respondents from Section 18 were asked to indicate their spending on food weekly; all spending on food weekly were represented in the results, as shown in Table 7 and Figure 7. The percentage of the spending on food weekly in range RM(50-54), RM(55-59), RM(60-64), RM(65-69), RM(70-74), RM(75-79), RM(80-84), RM(85-89), RM(90-94), RM(95-99), RM(100-104), RM(105-109), RM(110-114), RM(115-119), RM(120-124), RM(125-129), RM(130-134), RM(135-139) and RM(140-144) are 23%, 17%, 10%, 3%, 3%, 3%, 0%, 13%, 7%, 0%, 0%, 0%, 0%, 0%, 3%, 0%, 0% and 17% respectively.

Spending on food (RM)	Frequency
50-54	7
55-59	5
60-64	3
65-69	1
70-74	1
75-79	1
80-84	0
85-89	4
90-94	2
95-99	0
100-104	0
105-109	0
110-114	0
115-119	0
120-124	1
125-129	0
130-134	0

135-139	0
140-144	5

Table 7: Table of Spending on Food and Frequency

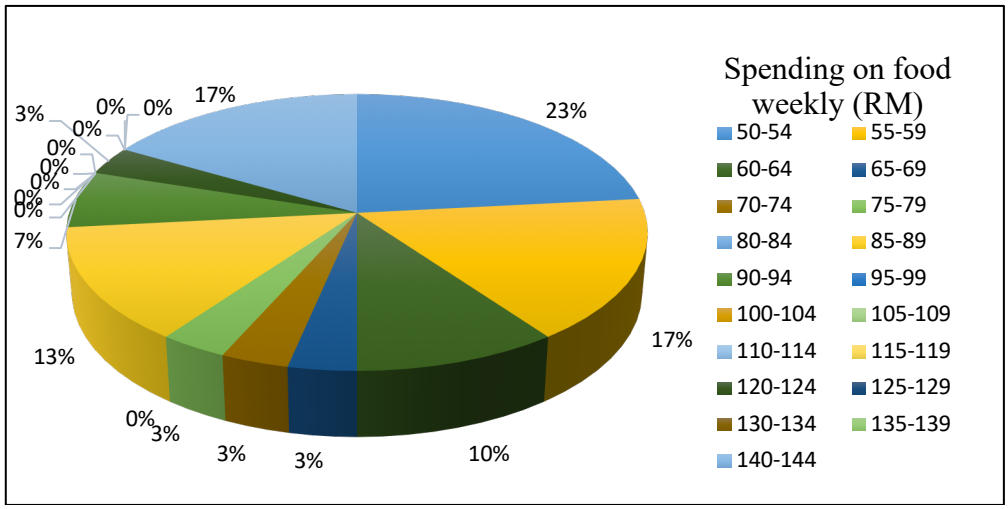


Figure 7: Spending on food weekly Pie Chart

Parents' Monthly Income

The respondents from Section 18 were asked to indicate their parents' monthly income; all parents' income were represented in the results, as shown in Table 8 and Figure 8. The percentage of the parents' monthly income in range RM(3001-4000), RM(4001-5000), RM(5001-6000), RM(6001-7000), RM(7001-8000), RM(8001-9000), RM(9001-10000), RM(10001-11000) and RM(11001-12000) are 14%, 10%, 10%, 3%, 0%, 7%, 23%, 3% and 30% respectively.

Parents' Monthly Income (RM)	Frequency
3001 - 4000	4
4001 - 5000	3
5001 - 6000	3
6001 - 7000	1
7001 - 8000	0
8001 - 9000	2
9001 - 10000	7
10001 - 11000	1
11001 - 12000	9

Table 8: Table of Cumulative Income and Frequency

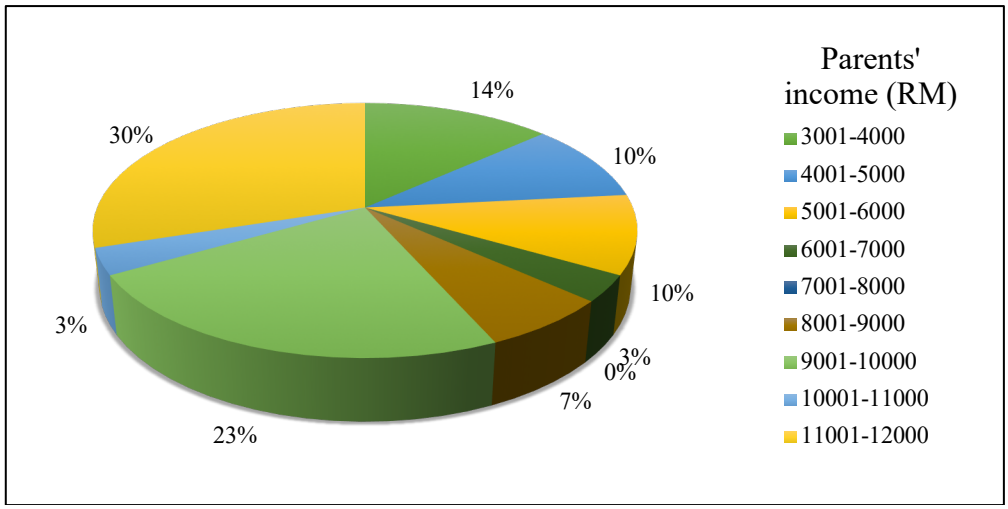


Figure 8: Parents' Income and Frequency

The Measure of Central Tendency and

Dispersion of the Data Set

Section 13

Weight

Weight (kg)	f	×	f×	×²	f×²	**F**
30-39	1	34.5	34.5	1190.25	1190.25	1
40-49	9	44,5	400.5	1980.25	17822.25	10
50-59	9	54.5	490.5	2970.25	26732.25	19
60-69	7	64.5	451.5	4160.25	29121.75	26
70-79	0	74.5	0	5550.25	0	26
80-89	4	84.5	338	7140.25	285161	30
90-99	0	94.5	0	8930.25	0	30
Total	30		1715		103427.5	

Mode	$L + \left(\frac{d1}{d1 + d2}\right) C$ $= 49.5 + \left(\frac{0}{0+2}\right) 10$ $= 49.5$ **∴ mode = 49.5**
Mean	$\frac{\sum fx}{\sum f}$ $= \frac{1715}{30}$ $= 50.17$ **∴ mean = 50.17**
Median	$L + (\frac{\frac{n}{2} - F}{f})\mathrm{C}$ $= 49.5 + \left(\frac{\frac{15}{2} - 10}{9}\right) 10$ $= 55.06$ **∴ median = 55.06**
Quartile 1	$L + (\frac{\frac{1}{4}n - F}{f})\mathrm{C}$ $= 39.5 + \left(\frac{7.5-1}{9}\right) 10$ $= 46.72$ **∴ quartile 1 = 46.72**

Quartile 3	$L + (\frac{\frac{3}{4}n - F}{f})C$ $= 59.5 + \left(\frac{22.5-19}{7}\right)10$ $= 64.5$ **∴ quartile 3 = 64.5**
Interquartile range	$Q_3 - Q_1$ $= 64.5 - 46.72$ $= 17.78$ **∴ interquartile range = 17.78**
Variance	$\frac{1}{f-1}[\sum fx^2 - \frac{(\sum fx)^2}{\sum f}]$ $= \frac{1}{29}\left[103427.5 - \frac{2941225}{30}\right]$ $= 185.75$ **∴ variance = 185.75**
Standard deviation	$\sqrt{s^2}$ $= \sqrt{185.75^2}$ $= 13.63$ **∴ standard deviation = 13.63**
Skewness	$\frac{(mean - mode)}{std\ deviation}$ $= \frac{(50.17 - 49.5)}{13.63}$ $= 0.049$ **∴ skewness = 0.049, skewed to the right**

Height

Height (cm)	***f***	×	***f*×**	**×²**	***f*×²**	**F**
145-149	4	147	588	21609	86436	4
150-154	4	152	608	23104	92416	8
155-159	1	157	157	24649	24649	9
160-164	6	162	972	26244	157464	15
165-169	6	167	1002	27889	167334	21
170-174	2	172	344	29584	59168	23
175-179	3	177	531	31329	93987	26
180-184	2	182	364	33124	66248	28

185-189	2	187	374	34969	69938	30
Total	30		4940		817640	

Mode	$L + \left(\frac{d1}{d1 + d2}\right) C$ $= 164.5 + \left(\frac{0}{0+4}\right) 5$ $= 164.5$ **∴ mode = 164.5**
Mean	$\frac{\sum fx}{\sum f}$ $= \frac{4940}{30}$ $= 164.67$ **∴ mean = 164.67**
Median	$L + (\frac{\frac{n}{2} - F}{f})\mathrm{C}$ $= 164.5 + \left(\frac{15-15)}{6}\right) 5$ $= 164.5$ **∴ median = 164.5**
Quartile 1	$L + (\frac{\frac{1}{4}n - F}{f})\mathrm{C}$ $= 149.5 + \left(\frac{7.5 - 4)}{4}\right) 5$ $= 153.88$ **∴ quartile 1 = 153.88**
Quartile 3	$L + \left(\frac{\frac{3}{4}n - F}{f}\right) C$ $= 169.5 + \left(\frac{22.5 - 21}{2}\right) 5$ $= 173.25$ **∴ quartile 3 = 173.25**
Interquartile range	$Q_3 - Q_1$ $= 173.25 - 153.88$ $= 19.37$ **∴ interquartile range = 19.37**

Variance	$\frac{1}{f-1}[\sum fx^2 - \frac{(\sum fx)^2}{\sum f}]$ $= \frac{1}{29}\left[817640 - \frac{24403600}{30}\right]$ $=144.37$ **∴ variance = 144.37**
Standard deviation	$\sqrt{s^2}$ $= \sqrt{144.37^2}$ $= 12.02$ **∴ standard deviation = 12.02**
Skewness	$\frac{(mean - mode)}{std\ deviation}$ $= \frac{(164.67-164.5)}{12.02}$ $= 0.014$ **∴ skewness = 0.014, skewed to the right**

Spending on food weekly

Spending on food (RM)	***f***	×	***f*×**	**×²**	***f*×²**	**F**
50-54	5	52	260	2704	13520	5
55-59	8	57	456	3249	25992	13
60-64	2	62	124	3844	7688	15
65-69	1	67	67	4489	4489	16
70-74	2	72	144	5184	10368	18
75-79	3	77	231	5929	17787	21
80-84	1	82	82	6724	6724	22
85-89	2	87	174	7569	15138	24
90-94	0	92	0	8464	0	24
95-99	1	97	97	9409	9409	25
100-104	2	102	204	10404	20808	27
105-109	1	107	107	11449	11449	28
110-114	0	112	0	12544	0	28
115-119	0	117	0	13689	0	28
120-124	0	122	0	14884	0	28
125-129	0	127	0	16129	0	28
130-139	0	132	0	17424	0	28
140-144	2	142	284	20164	40328	30

Total	30		2230		183700	

Mode	$L + \left(\frac{d1}{d1 + d2}\right) C$ $= 54.5 + \left(\frac{3}{3+6}\right) 5$ $= 56.17$ **∴ mode = 56.17**
Mean	$\frac{\sum fx}{\sum f}$ $= \frac{223}{30}$ $= 74.33$ **∴ mean = 74.33**
Median	$L + (\frac{\frac{n}{2} - F}{f})\mathrm{C}$ $= 54.5 + \left(\frac{15-5)}{8}\right) 5$ $= 60.75$ **∴ median = 60.75**
Quartile 1	$L + (\frac{\frac{1}{4}n - F}{f})\mathrm{C}$ $= 54.5 + \left(\frac{7.5-5}{8}\right) 5$ $= 56.06$ **∴ quartile 1 = 56.06**
Quartile 3	$L + \left(\frac{\frac{3}{4}n - F}{f}\right) C$ $= 84.5 + \left(\frac{22.5 - 22}{2}\right) 5$ $= 85.75$ **∴ quartile 3 = 85.75**
Interquartile range	$Q_3 - Q_1$ $= 85.75 - 56.06$ $= 29.69$ **∴ interquartile range = 29.69**

Variance	$\frac{1}{f-1}[\sum fx^2 - \frac{(\sum fx)^2}{\sum f}]$ $= \frac{1}{29}\left[183700 - \frac{4972900}{30}\right]$ $= 618.51$ **∴ variance = 618.51**
Standard deviation	$\sqrt{s^2}$ $= \sqrt{618.51^2}$ $= 24.87$ **∴ standard deviation = 24.87**
Skewness	$\frac{(mean - mode)}{std\ deviation}$ $= \frac{(74.33-56.17)}{24.87}$ $= 0.730$ **∴ skewness = 0.730, skewed to the right**

Parents' monthly income

Parents' monthly Income (RM)	***f***	×	***f*×**	**×²**	***f*×²**	**F**
3001 - 4000	11	3500.5	3511.5	12253500.25	134788502.8	11
4001 - 5000	2	4500.5	9001	81018001	162036002	13
5001 - 6000	1	5500.5	5500.5	30255500.25	30255500.25	14
6001 - 7000	3	6500.5	19501.5	42256500.25	126769500.8	17
7001 - 8000	2	7500.5	15001	56257500.25	112515000.5	19
8001 - 9000	2	8500.5	17001	72258500.25	1444517001	21
9001 - 10000	1	9500.5	9500.5	90259500.25	90259500.25	22
10001 - 11000	1	10500.5	10500.5	110260500.3	110260500.3	23
11001 - 12000	7	11500.5	80503.5	132261500.3	132261500.3	30
Total	30		170021		3801933008	

Mode	$L + \left(\frac{d1}{d1 + d2}\right) C$ $= 3000.5 + \left(\frac{11}{11+9}\right) 1000$ $= 3550.5$ **∴ mode = 3550.5**

Mean	$\frac{\sum fx}{\sum f}$ $= \frac{170021}{30}$ $= 5667.37$ **∴ mean = 5667.37**
Median	$L + (\frac{\frac{n}{2} - F)}{f})C$ $= 3000.5 + \left(\frac{15-0)}{11}\right)1000$ $= 4364.14$ **∴ median = 4364.14**
Quartile 1	$L + (\frac{\frac{1}{4}n - F}{f})C$ $= 3000.5 + \left(\frac{7.5-0}{11}\right)1000$ $= 3682.32$ **∴ quartile 1 = 3682.32**
Quartile 3	$L + \left(\frac{\frac{3}{4}n - F}{f}\right)C$ $= 10000.5 + \left(\frac{22.5-22}{1}\right)1000$ $= 10500.5$ **∴ quartile 3 = 10500.5**
Interquartile range	$Q_3 - Q_1$ $= 10500.5 - 3682.32$ $= 6818.18$ **∴ interquartile range = 6818.18**
Variance	$\frac{1}{f-1}[\sum fx^2 - \frac{(\sum fx)^2}{\sum f}]$ $= \frac{1}{29}[3801933008 - 963571348]$ $= 97874540$ **∴ variance = 97874540**
Standard deviation	$\sqrt{s^2}$ $= \sqrt{97874540^2}$ $= 9893.16$ **∴ standard deviation = 9893.16**

Skewness	$\frac{(mean - mode)}{std\ deviation}$ $= \frac{(5667.37-3550.5)}{9893.16}$ $= 0.214$ **∴ skewness = 0.214, skewed to the right**

Section 18

Weight

Weight (kg)	***f***	×	***f*×**	**×²**	***f*×²**	**F**
30-39	0	34.5	0	1190.25	0	0
40-49	2	44.5	89	1980.25	3960.5	2
50-59	15	54.5	817.5	2970.25	44553.75	17
60-69	5	64.5	322.5	4160.25	20801.25	22
70-79	3	74.5	223.5	5550.25	16650.75	25
80-89	2	84.5	169	7140.25	14280.5	27
90-99	0	94.5	0	8930.25	0	27
100-109	3	104.5	313.5	10920.25	32760.75	30
Total	30		1935		133007.5	

Mode	$L + \left(\frac{d1}{d1 + d2}\right) C$ $= 49.5 + \left(\frac{13}{13+10}\right) 10$ $= 55.15$ **∴ mode = 55.15**
Mean	$\frac{\sum fx}{\sum f}$ $= \frac{1935}{30}$ $= 64.5$ **∴ mean = 64.5**

Median	$L + (\frac{\frac{n}{2}-F}{f})C$ $= 49.5 + \left(\frac{15-2}{15}\right)10$ $= 58.17$ **∴ median = 58.17**
Quartile 1	$L + (\frac{\frac{1}{4}n-F}{f})C$ $= 49.5 + \left(\frac{7.5-2}{15}\right)10$ $= 53.17$ **∴ quartile 1 = 53.17**
Quartile 3	$L + \left(\frac{\frac{3}{4}n-F}{f}\right)C$ $= 69.5 + \left(\frac{22.5-22}{3}\right)10$ $= 71.17$ **∴ quartile 3 = 71.17**
Interquartile range	$Q_3 - Q_1$ $= 71.17 - 53.17$ $=18$ **∴ interquartile range = 18**
Variance	$\frac{1}{f-1}[\sum fx^2 - \frac{(\sum fx)^2}{\sum f}]$ $= \frac{1}{29}\left[133007.5 - \frac{3744225}{30}\right]$ $= 282.76$ **∴ variance = 282.76**
Standard deviation	$\sqrt{s^2}$ $= \sqrt{282.76^2}$ $= 16.82$ **∴ standard deviation = 16.82**
Skewness	$\frac{(mean - mode)}{std\ deviation}$ $= \frac{(64.5-55.15)}{16.82}$ $= 0.556$ **∴ skewness = 0.556, skewed to the right**

Height

Height (cm)	f	×	f×	×²	f×²	**F**
150-154	6	152	912	23104	138624	6
155-159	9	157	1413	24649	221841	15
160-164	4	162	648	26244	104976	19
165-169	4	167	668	27889	111556	23
170-174	1	172	172	29584	29584	24
175-179	3	177	531	31329	93987	27
180-184	1	182	182	33124	33124	28
185-189	2	187	374	34969	69938	30
Total	30		4900		803630	

Mode	$L + \left(\frac{d1}{d1+d2}\right) C$ $= 154.5 + \left(\frac{3}{3+5}\right) 5$ $= 156.38$ **∴ mode = 156.38**
Mean	$\frac{\sum fx}{\sum f}$ $= \frac{4900}{30}$ $= 163.33$ **∴ mean = 160.33**
Median	$L + (\frac{\frac{n}{2}-F)}{f})C$ $= 154.5 + \left(\frac{15-6}{9}\right) 5$ $= 159.5$ **∴ median = 159.5**

Quartile 1	$L + \left(\frac{\frac{1}{4}n - F}{f} \right) C$ $= 154.5 + \left(\frac{7.5-6}{9} \right) 5$ $= 155.33$ **∴ quartile 1 = 155.33**
Quartile 3	$L + \left(\frac{\frac{3}{4}n - F}{f} \right) C$ $= 164.5 + \left(\frac{22.5-19}{4} \right) 5$ $= 168.88$ **∴ quartile 3 = 168.88**
Interquartile range	$Q_3 - Q_1$ $= 168.88 - 155.33$ $= 13.55$ **∴ interquartile range = 13.55**
Variance	$\frac{1}{f-1}[\sum fx^2 - \frac{(\sum fx)^2}{\sum f}]$ $= \frac{1}{29}\left[803630 - \frac{24010000}{30}\right]$ $= 113.68$ **∴ variance = 113.68**
Standard deviation	$\sqrt{s^2}$ $= \sqrt{113.68^2}$ $= 10.66$ **∴ standard deviation = 10.66**
Skewness	$\frac{(mean - mode)}{std\ deviation}$ $= \frac{(163.33-156.38)}{10.66}$ $= 0.652$ **∴ skewness = 0.652, skewed to the right**

Spending on food

Spending on food (RM)	***f***	×	***f*×**	**×²**	***f*×²**	**F**
50-54	7	52	364	2704	18928	7

55-59	5	57	285	3249	16245	12
60-64	3	62	186	3844	11532	15
65-69	1	67	67	4489	4489	16
70-74	1	72	72	5184	5184	17
75-79	1	77	77	5929	5929	18
80-84	0	82	0	6724	0	18
85-89	4	87	348	7569	30276	22
90-94	2	92	184	8464	16928	24
95-99	0	97	0	9409	0	24
100-104	0	102	0	10404	0	24
105-109	0	107	0	11449	0	24
110-114	0	112	0	12544	0	24
115-119	0	117	0	13689	0	24
120-124	1	122	122	14884	14884	25
125-129	0	127	0	16129	0	25
130-134	0	132	0	17424	0	25
135-139	0	137	0	18769	0	25
140-144	5	142	710	20164	100820	30
Total	30		2415		225215	

Mode	$L + \left(\frac{d1}{d1 + d2}\right) C$ $= 49.5 + \left(\frac{7}{7+2}\right) 5$ $= 53.39$ **∴ mode = 53.39**
Mean	$\frac{\sum fx}{\sum f}$ $= \frac{2415}{30}$ $= 80.5$ **∴ mean = 80.5**
Median	$L + (\frac{\frac{n}{2} - F}{f})\mathrm{C}$ $= 59.5 + \left(\frac{15-12}{3}\right) 5$ $= 64.5$ **∴ median = 64.5**

Quartile 1	$L + (\frac{\frac{1}{4}n-F}{f})C$ $= 54.5 + \left(\frac{7.5-7}{5}\right)5$ $= 55$ **∴ quartile 1 = 55**
Quartile 3	$L + \left(\frac{\frac{3}{4}n-F}{f}\right)C$ $= 89.5 + \left(\frac{22.5-22}{2}\right)5$ $= 90.75$ **∴ quartile 3 = 90.75**
Interquartile range	$Q_3 - Q_1$ $= 90.75 - 55$ $= 35.75$ **∴ interquartile range = 35.75**
Variance	$\frac{1}{f-1}[\sum fx^2 - \frac{(\sum fx)^2}{\sum f}]$ $= \frac{1}{29}\left[225215 - \frac{5832225}{30}\right]$ $= 1062.33$ **∴ variance = 1062.33**
Standard deviation	$\sqrt{s^2}$ $= \sqrt{1062.33^2}$ $= 32.59$ **∴ standard deviation = 32.59**
Skewness	$\frac{(mean - mode)}{std\ deviation}$ $= \frac{(80.5-56.5)}{32.59}$ $= 0.736$ **∴ skewness = 0.736, skewed to the right**

Parents' income monthly

Parents' income (RM)	***f***	×	***f*×**	**×²**	***f*×²**	**F**
3001 - 4000	4	3500.5	14002	12253500.25	49014001	4

4001 - 5000	3	4500.5	13501.5	81018001	243054003	7
5001 - 6000	3	5500.5	16501.5	30255500.25	90766500.75	10
6001 - 7000	1	6500.5	6500.5	42256500.25	42256500.25	11
7001 - 8000	0	7500.5	0	56257500.25	0	11
8001 - 9000	2	8500.5	17001	72258500.25	144517000.5	13
9001 - 10000	7	9500.5	66503.5	90259500.25	631816501.8	20
10001 - 11000	1	10500.5	10500.5	110260500.3	110260500.3	21
11001 - 12000	9	11500.5	103504.5	132261500.3	1190353503	30
Total	30		248015		2502038510	

Mode	$L + \left(\frac{d1}{d1 + d2}\right) C$ $= 9000.5 + \left(\frac{5}{5 + 6}\right) 1000$ $= 9455.05$ **∴ mode = 9455.05**
Mean	$\frac{\sum fx}{\sum f}$ $= \frac{248015}{30}$ $= 8267.17$ **∴ mean = 8267.17**
Median	$L + (\frac{\frac{n}{2} - F)}{f})\mathrm{C}$ $= 9000.5 + \left(\frac{15-13}{7}\right) 1000$ $= 9286.21$ **∴ median = 9286.21**
Quartile 1	$L + (\frac{\frac{1}{4}n - F}{f}) C$ $= 5000.5 + \left(\frac{7.5-7}{3}\right) 1000$ $= 5167.17$ **∴ quartile 1 = 5167.17**

Quartile 3	$L + \left(\frac{\frac{3}{4}n - F)}{f} \right) C$ $= 11000.5 + (\frac{22.5 - 21}{9})1000$ $= 11167.17$ **∴ quartile 3 = 11167.17**
Interquartile range	$Q_3 - Q_1$ $= 11167.17 - 5167.17$ $= 6000.00$ **∴ interquartile range = 6000.00**
Variance	$\frac{1}{f-1}[\sum fx^2 - \frac{(\sum fx)^2}{\sum f}]$ $= \frac{1}{29}[2502038510 - 2050381341]$ $= 15574385.14$ **∴ variance = 15574385.14**
Standard deviation	$\sqrt{s^2}$ $= \sqrt{15574385.14^2}$ $= 3946.44$ **∴ standard deviation = 3946.44**
Skewness	$\frac{(mean - mode)}{std\ deviation}$ $= \frac{(8267.17 - 9455.05)}{3946.44}$ $= -0.301$ **∴ skewness = -0.301, skewed to the left**

The average students' weight in Section 18 gives 64.5 kg 2hich is higher compare to Section 13 which gives an average weight of 50.17kg. The mean of height in Section 18 and Section 13 is 160.33cm and 164.67cm respectively, so Section 18 has a lower mean of height. Section 18 has a higher average of parents' income, RM 8267.17 compare to Section 13 that the mean is RM 5667.37. The average of spending of food weekly in Section 18 (RM 80.50)is higher than the average spending of food weekly in Section 13 (RM 74.33).

The Difference of the Distribution Between the Sections

The measurement shows the distribution of weight, height and spending on food weekly in Section 13 and Section 18 are skewed to the right because the skewness are in positive number. However, the skewness of parents' income is in positive number, so the distribution of parents'

income in Section 13 is skewed to the right, while the distribution of parents' income in Section 18 is skewed to the left as the skewness is in negative number.

The Benefits of the Study

On the basis of the findings, it offer both information and analysis in a quick accessing and easy understanding way. Data visualization enables users to view and understand large amount of information regarding to students' weight and height, spending on food weekly and parents' income. One of the greatest advantage of data visualization is it brings triable insights to the surface. Unlike one-dimensional tables and charts that can only be viewed, data visualization tools enable users to interact with data. The study also proves that students' weight, height and parents' income will affect the students' spending on food weekly

The Weakness of the Study

The main weakness of the study is it may be limited through the use of a form as a data collection instrument. Because the form was generally be brief, some of weight range, height range, spending on food per week and parents' income may not have been included in the form, causing the result obtained may not be accurate and precise. The sample of students for the study was chosen for convenience and may not be representative of the total population of UTMSPACE foundation session 2019/2020 students.

Conclusion

The purpose of this study was to determine the student's weight, height, spending on food weekly and parents' income. The study shows that the students' weight, height and parents' income will affect the spending on food weekly. As the findings shown, the average of students' height, weight and parents income in Section 18 is higher compare to Section 13. Thus, the conditions cause the spending of food for students in Section 18 is higher with the evidence: the mean of spending of food per week for Section 18 is higher compare to Section 13. In conclusion, the students in Section 18 have a higher spending on food every week .

References

LIST OF FORMULA **FSPM0034**

$$\mu = \frac{\sum_{i=1}^{N} x_i}{N} \qquad \bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

$$\sigma^2 = \frac{1}{N}\left(\sum_{i=1}^{N} x_i^2 - \frac{\sum_{i=1}^{N} x_i^2}{N}\right) \qquad s^2 = \frac{1}{n-1}\left(\sum_{i=1}^{n} x_i^2 - \frac{\sum_{i=1}^{n} x_i^2}{n}\right)$$

$$\sigma = \sqrt{\sigma^2} \qquad s = \sqrt{s^2}$$

$$\mu = \frac{\sum_{i=1}^{N} f_i x_i}{\sum_{i=1}^{N} f_i} \qquad \bar{x} = \frac{\sum_{i=1}^{n} f_i x_i}{\sum_{i=1}^{n} f_i}$$

$$\sigma^2 = \frac{1}{\sum_{i=1}^{N} f_i}\left(\sum_{i=1}^{N} f_i x_i^2 - \frac{\left(\sum_{i=1}^{N} f_i x_i\right)^2}{\sum_{i=1}^{N} f_i}\right) \qquad s^2 = \frac{1}{\sum_{i=1}^{n} f_i - 1}\left(\sum_{i=1}^{n} f_i x_i^2 - \frac{\left(\sum_{i=1}^{n} f_i x_i\right)^2}{\sum_{i=1}^{n} f_i}\right)$$

$$\sigma = \sqrt{\sigma^2} \qquad s = \sqrt{s^2}$$

$$\text{Median}: \quad L + \left(\frac{\frac{n}{2} - F}{f}\right) \times c \qquad P_i = L + \left(\frac{\frac{i}{100}(n) - F}{f}\right) \times c$$

$$\text{Mode}: \quad L + \left(\frac{\lambda_1}{\lambda_1 + \lambda_2}\right) \times c \qquad Q_i = L + \left(\frac{\frac{i}{4}(n) - F}{f}\right) \times c$$

$$D_i = L + \left(\frac{\frac{i}{10}(n) - F}{f}\right) \times c$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}, \; P(B) > 0.$$

$${}^{n}C_r = \binom{n}{r} = \frac{n!}{(n-r)!r!} \qquad {}^{n}P_r = \binom{n}{r} = \frac{n!}{(n-r)!}$$

Survey on the student of UTM Foundation

* Required

Untitled Section

Your Section . *
- 13
- 18

Please select your weight range (kg). *
- 30 - 39
- 40 - 49
- 50 - 59
- 60 - 69
- 70 - 79
- 80 - 89
- 90 - 99
- 100 - 109
- 110 - 119
- 120 - 129

Please select your height range (cm). *
- 140 - 144
- 145 - 149
- 150 - 154
- 155 - 159
- 160 - 164
- 165 - 169
- 170 - 174
- 175 - 179
- 180 - 184
- 185 - 189

Please select the spending on food per week (RM). *
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- 85 - 89
- 90 - 94
- 95 - 99
- 100 - 104
- 105 - 109
- 110 - 114
- 115 - 119
- 120 - 124
- 125 - 129
- 130 - 139
- 140- 144

Total of both of your parents' income (RM). *

- 3001 - 4000
- 4001 - 5000
- 5001 - 6000
- 6001 - 7000
- 7001 - 8000
- 8001 - 9000
- 9001 - 10000
- 10001 - 11000
- 11001 - 12000