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Radiology :-

Q1:- Calculate the overall mean consumption of fresh vegetable fruit, rice, fish and meat for men and women separately. Calculate also meat for men and women combined.

Overall Mean (MEN) :-

$$\text{Fresh vegetable } \frac{(204 + 259 + 266 + 317)}{4} = 261.5 \text{ gram}$$

$$\text{Fruit :- } \frac{31 + 45 + 69 + 105}{4} = 62.5 \text{ gram}$$

$$\text{Rice :- } \frac{367 + 337 + 269 + 246}{4} = 304.75 \text{ gram}$$

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$$\text{Fish:- } \frac{23 + 28 + 31 + 44}{4} = 31.5 \text{ gram}$$

$$\text{Meat:- } \frac{70 + 61 + 69 + 77}{4} = 69.25 \text{ gram}$$

(MEAN WOMAN) :-

$$\text{Fresh vegetable: } \frac{178 + 235 + 266 + 304}{4} = 245.7 \text{ gram}$$

$$\text{Fruits - } \frac{(28 + 46 + 70 + 121)}{4} = 66.25 \text{ gram}$$

$$\text{Rice: } \frac{19 + 21 + 28 + 46}{4} = 28.5 \text{ gram}$$

$$\text{Fish :- } \frac{(19 + 21 + 28 + 46)}{4} = 28.5 \text{ gram}$$

$$\text{Meat:- } \frac{(48 + 43 + 54 + 63)}{4} = 52 \text{ gram}$$

Standard Deviation:-

The formula of standard deviations :-

$$= \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$$

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Standard Deviation (Men)

Fresh vegetable: Mean = 261.5

$$S.D = \sqrt{\frac{(204 - 261.5)^2 + (259 - 261.5)^2 + (266 - 261.5)^2 + (317 - 261.5)^2}{4}}$$

$$S.D = \sqrt{\frac{3306.25 + 61.25 + 20.25 + 3080.25}{4}}$$

$$S.D = \sqrt{1603.25}$$

$$= 40.04$$

Fruits = Mean = 62.5

$$\sigma = \sqrt{\frac{(31 - 62.5)^2 + (45 - 62.5)^2 + (69 - 62.5)^2 + (105 - 62.5)^2}{4}}$$

$$\sigma = \sqrt{\frac{992.25 + 306.25 + 1806.25}{4}}$$

$$S.D = \sqrt{786.75}$$

$$S.D = 28.05$$

Rice:-

Using some the above equation and formula -

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$$S.D = 49.1$$

Fish \bar{x} Mean = 31.5

$$\sqrt{\frac{(23-31.5)^2 + (28-31.5)^2 + (31-31.5)^2 + (44-31.5)^2}{4}}$$

$$S.D \sqrt{80.25}$$

$$S.D = 708$$

Meat : Mean = 69.25

$$S.D = \sqrt{\frac{(70-69.25)^2 + (61-69.25)^2 + (69-69.25)^2 + (77-69.25)^2}{4}}$$

$$S.D = 32.2$$

$$S.D = 5.7$$

standard Deviation (women):-

Fresh vegetable : Mean = 245.75

$$S.D = \sqrt{\frac{(178-245.75)^2 + (235-245.75)^2 + (266-245.75)^2 + (304-245.75)^2}{4}}$$

$$S.D = \sqrt{2127}$$

$$S.D = 47$$

Fruits: Mean 66.25

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$$\sqrt{\frac{(28-66.25)^2 + (46-66.25)^2 + (70-66.25)^2 + (121-66.25)^2}{4}}$$

$$S.D = \sqrt{12.21}$$

$$S = 34.9$$

Rice = Mean 263.5

$$\sqrt{\frac{(315-263.5)^2 + (276-263.5)^2 + (243-263.5)^2 + (220-263.5)^2}{4}}$$

$$S.D = \sqrt{5121}$$

$$S.D = 71.6$$

Meat:- Mean = 52

$$S.D = \sqrt{\frac{(48-52)^2 + (43-52)^2 + (54-52)^2 + (63-52)^2}{4}}$$

$$S.D = \sqrt{222}$$

$$S.D = 14.9$$

overall consumption MEN & WOMEN

	Men	Women	Combined
Fresh vegetable	26.5	245.75	263.6 gram
Fruits	62.5	66.25	64.4 gram
Rice	304.75	263.5	284.1 gram
Fish	31.5	28.5	30 gram
Meat	62.25	52	60.6 gram

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Question No 1

* Part (b)

Describe in the other word.
What the figures for milk, root,
vegetable, Wheat Flour?

Ans:- The calculation indicate the
use of root vegetable are more
than milk, while use of wheat
flour is much more than milk
and root vegetables.

* Part (c)

What descriptive method is there
for both men and women ----
✓ across the four Parts -

Ans:- The men use more rice than
female while and fruits women
are more user than men. In
fish both male and female are
consume equally. They are equally
consumer in this case.

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*Part D :-

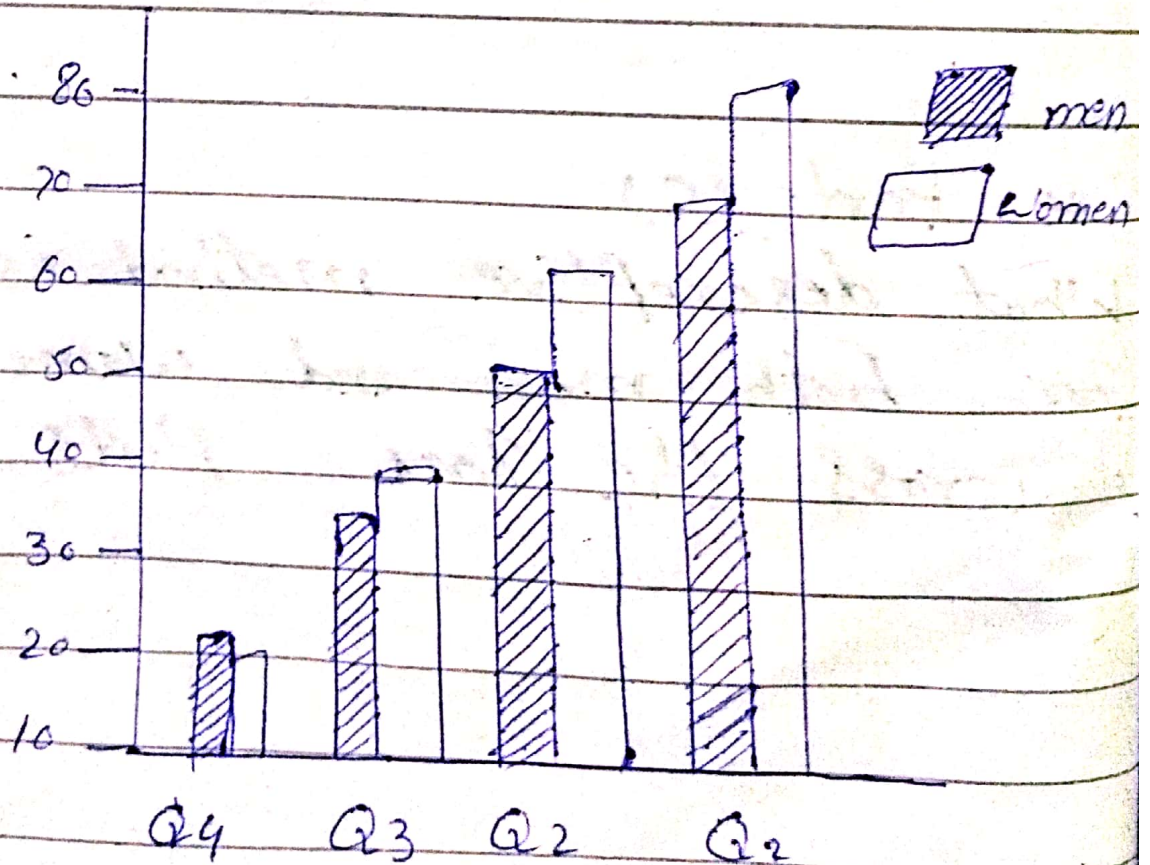
Draw a suitable diagram to show the difference b/w fish and fruit b/w men and women

Draw a suitable diagram to show ---

--- Draw a suitable diagram b/w men and women.

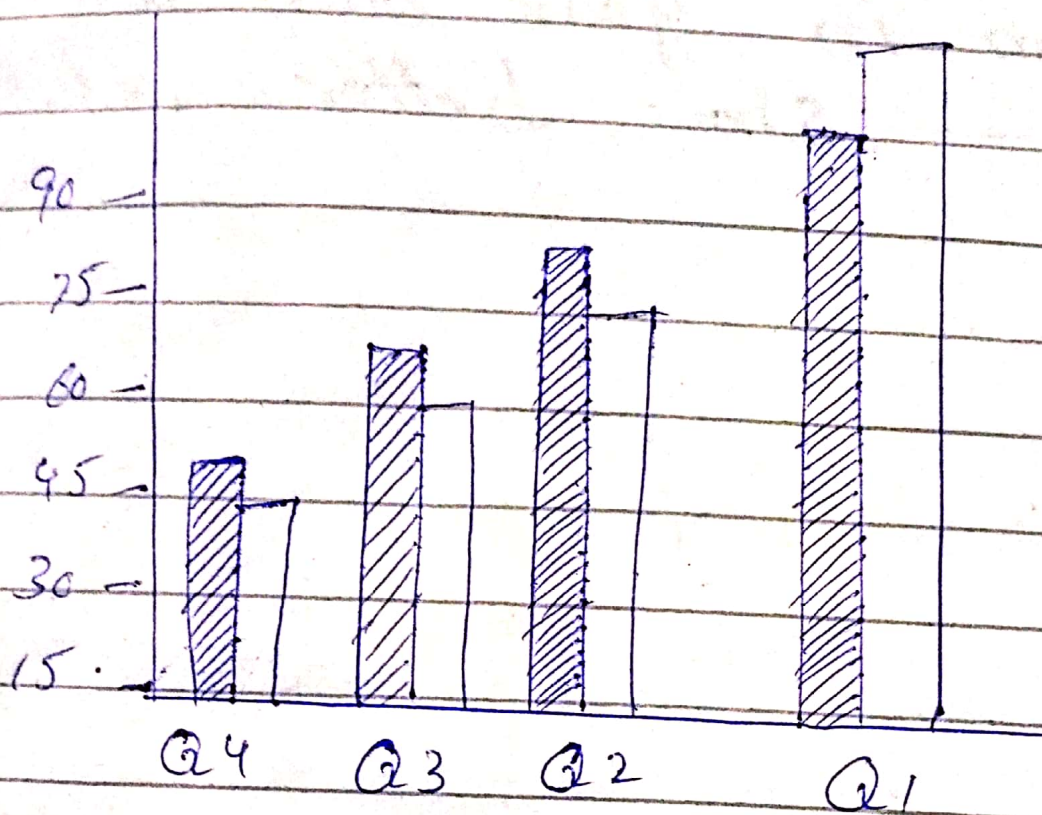
for fruit:-

for fruits:-



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For fish



Part E :-

Man require on overage about
----- or milk?

Ans:- By using ~~in~~ information
of given table it is true that
man needs more foods to
maintain its energy level

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*Part F

Explain in your own words
----- Show better result

Ans:- According to the above information the value of standard deviation is more than women in fresh vegetables, wheat flour, whole grams and meat.

in remaining categories the standard deviation is similar or equal in both the male and female.

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Q2:- Part A

Range	F	X $\frac{20+24}{2} = 22$	Fx 22	logx	flogx	11-36-81	f11-36-81
20-24	1	22	22	1.34	1.3424	14.8	14.8
25-29	3	27	81	1.43	4.2940	9.8	29.4
30-34	5	32	160	1.50	7.5257	4.8	24
35-39	8	37	296	1.56	12.5055	0.2	1.6
40-44	5	42	210	1.62	8.1162	5.2	26
45-49	2	47	94	1.67	3.3441	10.2	20.4
50-54	0	52	0	1.71	0	15.2	0
55-59	1	54	54	1.75	1.7558	20.2	20.2
	05		920		38.923		138.4

(11) ARITHMETIC Mean

$$\Rightarrow A.M = \frac{\sum Fx}{\sum F}$$

$$A.M = \frac{920}{25}$$

$$A.M = 36.8 \text{ inches}$$

Geometric Mean

$$\Rightarrow G.M = \text{Antilog} \left(\frac{\sum F \log x}{\sum F} \right)$$

$$G.M = \text{Antilog} \left(\frac{3.847238}{25} \right)$$

$$G.M = \text{Antilog} (1.5589)$$

$$G.M = 36.05 \text{ inches}$$

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HARMONIC MEAN:-

$$H.M = \frac{\sum F}{\sum (F/x)}$$

$$H.M = \frac{(36.05)^2}{36.8}$$

$$H.M = \frac{1299.6025}{36.8}$$

$$H.M = 35.31 \text{ inches}$$

Median:-

C-B

C-F

20 - 24	1	19.5 - 24.5	1
25 - 29	3	24.5 - 29.5	4
30 - 34	5	29.5 - 34.5	9
35 - 39	8	34.5 - 39.5	17
40 - 44	5	39.5 - 44.5	12
45 - 49	2	44.5 - 49.5	24
50 - 54	0	49.5 - 54.5	24
55 - 59	1	54.5 - 59.5	25

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$$\text{Median} = l + \frac{h}{F} \left(\frac{N}{2} - c \right)$$

$$\text{Median} = 34.5 + \frac{5}{8} (12.5 - 9)$$

$$\text{Median} = 36.687$$

MODE:-

$$\text{Mode} = l + \frac{f_m - f_1}{(f_m - f_1) + (f_m + f_2)} \times h$$

$$\text{Mode} = 39.5 + \frac{8 - 5}{(8 - 5) + (8 + 5)} \times 5$$

$$\text{Mode} = 37 \text{ Ans -}$$

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QUANTILES :-

1st Quantile

$$Q_1 = l + \frac{h}{F} (\frac{N}{4} - c)$$

$$l = 29.5, h = 5, f = 5, c = 4$$

$$Q_1 \therefore 29.5 + \frac{5}{5} (\frac{25-4}{4})$$

$$Q_1 = 29.5 + (6.25 - 4)$$

$$Q_1 = 29.5 + 2.25$$

$$Q_1 = 31.75 \quad \text{Ans -}$$

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Qartile = 2

$$Q_2 = L + \frac{h}{F} \left(\frac{N}{4} - C \right)$$

$$Q_2 = 34.5 + \frac{5}{5} (6.25 - 4)$$

$$Q_2 = 34.5 + 2.25$$

$$Q_2 = 36.75 \text{ Ans}$$

$$Q_3 :- L + \frac{h}{F} \left(\frac{3N}{4} - C \right)$$

$$L=39, h=5, f=5 - C=17$$

$$Q_3 = 39.5 + \frac{5}{5} \left(\frac{3 \times 25}{4} - 17 \right)$$

$$Q_3 = 39.5 + (18.75 - 17)$$

$$Q_3 = 39.5 + (1.75)$$

$$Q_3 = 39.5 + 1.75$$

$$Q_3 = 41.25 \text{ Ans}$$

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DECILES:-

Formula

$$D = L + \frac{h}{F} \left(\frac{m \cdot n}{10} - C \right)$$

$$L = 24.5, h = 5, F = 3$$

$$D_1 = 24.5 + \frac{5}{3} \left(\frac{25}{10} - 1 \right)$$

$$D_1 = 24.5 + (1.66)(2.5 - 1)$$

$$D_1 = 24.5 + 2.5$$

$$D_1 = 27 \text{ Ans}$$

PERCENTILE:-

General Formula

$$P_i = \frac{L+H}{F} \left(\frac{n}{100} - C \right)$$

$$P_i = 19.5 + \left(\frac{5}{1} \right) \left(\frac{25}{100} - 1 \right)$$

$$P_i = 19.5 + 5 \left(0.75 \right)$$

$$P_i = 19.5 + 5 \left(0.75 \right)$$

$$P_i = 24.5 \left(0.75 \right)$$

$$P_i = 18.3 \text{ Ans}$$

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Range:-

$$\text{Range} = \text{Max} - \text{Min}$$

$$\text{Max} = 57 - \cancel{22}$$

$$\text{Min} = 22$$

$$\text{Range} = 57 - 22 = 35 \text{ Ans}$$

Quartile Deviation:-

$$\text{Quartile Deviation} = \frac{Q_3 - Q_1}{2}$$

$$\Rightarrow Q_3 = 41.25, Q_1 = 31.75$$

$$Q.D = \frac{41.25 - 31.75}{2}$$

$$Q.D = \frac{9.5}{2} \Rightarrow 4.75 \text{ Ans}$$

Mean Deviation:-

$$M.D = \frac{\sum f(x - \bar{x})}{\sum f}$$

$$M.D = \frac{136.4}{25}$$

$$M.D = 5.456$$

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Rainfall inches	f	x	f	fx^2
20 - 24	3	22	22	484
25 - 29	5	27	81	2187
30 - 34	8	32	160	5120
35 - 39	5	37	296	10952
40 - 44	2	42	210	8820
45 - 49	0	47	94	4417
50 - 54	1	52	0	0
55 - 59		57	97	3249
	<u>25</u>		<u>920</u>	<u>35229</u>

VARIANCE :-

$$= \frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f} \right)^2$$

$$= \frac{35229}{25} - \left(\frac{920}{25} \right)^2$$

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$$\text{variance} = 1409.16 - (30.8)^2$$

$$= 1409.16 - 1354.24$$

$$\text{variance} = 54.92 \text{ Ans -}$$

⇒ **STANDARD DEVIATION**

$$S = \sqrt{\frac{\sum Fx^2}{\sum F} - \left(\frac{\sum Fx}{\sum F}\right)^2}$$

$$S.D = \sqrt{\frac{35230 - (36.8)^2}{25}}$$

$$S.D = \sqrt{54.96}$$

$$S.D = 7.413 \text{ Ans -}$$

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Coefficient of VARIATION

$$C.V = \frac{S.D}{\bar{x}} \times 100$$

$$C.V = \frac{7.413}{36.8} \times 100$$

$$C.V = 20.13 \text{ Ans}$$

SKEWNESS:-

$$SK = \frac{\text{mean} - \text{Mode}}{S.D}$$

$$SK = \frac{36.8 - 37}{7.413}$$

$$SK = 0.02698 \text{ Ans.}$$

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⇒ Converting data into ungrouped form:-

⇒ 22, 27, 27, 27, 32, 32, 32, 32, 32,
37, 37, 37, 37, 37, 37, 37, 37
42, 42, 42, 42, 42, 47, 47, 57

MEAN =

$$\text{Mean} = \frac{\sum x}{N} = \frac{920}{25} = 36.8 \text{ Ans.}$$

⇒ GEOMETRIC MEAN:-

$$GM = \text{antilog} \left(\frac{1}{n} \sum \log x \right)$$

$$GM = (22 \times 27 \times 27 \times \dots \times 57)^{1/25}$$

$$GM = 36.055 \text{ Ans.}$$

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HARMONIC MEAN

$$H.M = \frac{N}{\sum \frac{1}{x}} = 35.302 \text{ kms}$$

MEDIAN:-

$$\text{Size of } \frac{25^{th} + 26^{th}}{2}$$

$$= \frac{37 + 37}{2}$$

$$\Rightarrow \frac{37 + 37}{2} = 37 \text{ kms.}$$

MODE:-

Most frequent value
is 37

$$\text{MODE} = 37$$

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QUANTILE:-

$$Q_1 = \text{Size of } \frac{25N}{4} \text{ item}$$

$$= 61.25 \text{ item}$$

$$= 38$$

$$Q_3 = \text{Size of } \frac{3 \times 25N}{4} \text{ item}$$

$$= 183.75 \text{ item}$$

$$= 42 \text{ Ans.}$$

DEUIE:-

$$DE \Rightarrow \text{Size of } \frac{N}{100} \text{ item}$$

$$= 15.125 \text{ item}$$

$$= 22$$

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Range :-

$$\text{Range} = 77 - 22$$

$$R = 57 - 22$$

$$R = 35$$

M-D

Mean Deviation :-

$$M.D = \frac{\sum (x - \bar{x})}{N}$$

$$M.D = \frac{136 - 4}{25}$$

$$M.D = 5.46 \text{ Ans}$$

Quartile Deviation

$$Q.D = \frac{Q_3 - Q_1}{2}$$

$$Q.D = \frac{42 - 32}{2} = \frac{10}{2}$$

$$Q.D = 5 \text{ Ans}$$

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VARIANCE:-

$$\frac{\sum x^2}{n} - \left(\frac{\sum x}{2}\right)^2$$

$$= \frac{35230}{25} - \left(\frac{920}{25}\right)^2$$

$$\text{Variance} = 54.96$$

Standard Deviation:-

$$S = \frac{\sum x^2}{n} - \left(\frac{\sum x}{n}\right)^2$$

$$S = \frac{129}{8} - \left(\frac{25}{8}\right)^2$$

$$S = \sqrt{6.359}$$

$$S = 2.521$$

SKEWNESS:-

$$SK = \frac{Q_3 + Q_1 - 2Q_2}{Q_3 - Q_1}$$

$$SK = \frac{42 + 32 - 2(37)}{42 - 32}$$

$$SK = \frac{74 - 74}{10} = 0$$

It is normal

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Question No (3)

a) Describe the Purpose of census?

The main purpose of the census is to count the entire population of a country and location where they live. In other words, we can say that a type of survey they conduct the total set of observations.

Part (B)

We desire to modern type of survey. The first method is the development of government statistics and censuses.

Second is movement from censuses to simple method but in censuses it is compulsory to go from every object of population.

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Part (C)

A Population of 94% is high in might be regarded but it cannot rise any kind of error - until it should complete to 100% - The nature of the missing 6% is in issue of 94% Population who are Participant.

Part (D)

"Jedi Knight" indicate that people don't always take the senses seriously - There may be still the value in asking the question simple.

Routine collection data is widely use for medical research.

They include the stip of disease registories and clinical base data.

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at regional, national and international level.

Part (E)

The Potential Problems should be faced by U.K in 2021 census.

The availability of online connection to every person of the country is almost impossible.

The only way to overcome from this problem to provide online connection to all the country and give response to all of them.

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Potential Problem:-

The mean of census in government agencies to study every object under the observation.

It is difficult for the government agencies to guide all the people properly to complete the census

The END