Discussion section 1

1(a) year	# cancer deaths in U.S. that year
1970	331,000
1985	462,000

AM57
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(1)

direct comparison of 462,000 & 331,000 isn't meaningful, for several reasons:

(I) overall U.S. population ↑ over time

2 ways to compare numbers

① absolute:

$$462{,}000 - 331{,}000$$

$$(Y_{new} - Y_{old})$$

$$= 131{,}000$$

There were 131,000 more cancer deaths in U.S. in 1985 than in 1970

② relative:

$$\frac{462{,}000 - 331{,}000}{331{,}000} = \frac{Y_{new} - Y_{old}}{Y_{old}}$$

Q: 3 is what % bigger than 2?

A: $50\% = \frac{3-2}{2}$

the number of cancer deaths in U.S. in 1985 was 39.6% higher (larger) than the corresponding number in 1970

$\frac{462,000 - 331,000}{331,000}$

$- \frac{131\cancel{,000}}{331\cancel{,000}}$

$\div \frac{1}{3} = 33\%$

$\div \frac{1}{2} = 50\%$

$0.396 \leftarrow = 0.39577039$

$39.6\% \leftarrow = 39.577039\%$

we think that U.S. population growth from 1970 to 1985 was (a lot) smaller than 40%, so only some of the increase from

331,000 in 1970 to 462,000 in 1985 can be attributed to population growth

year	U.S. population	
1970	205,100,000	yold
1985	237,500,000	ynew

$$\frac{237{,}900{,}000}{205{,}100{,}000} \times 100\% \doteq 20\%$$

$$\doteq 1.16$$

$$= 16\% \text{ increase}$$

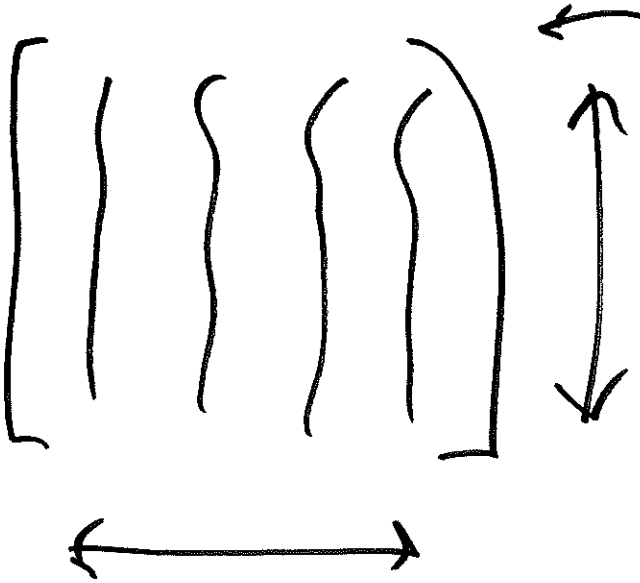
rate of

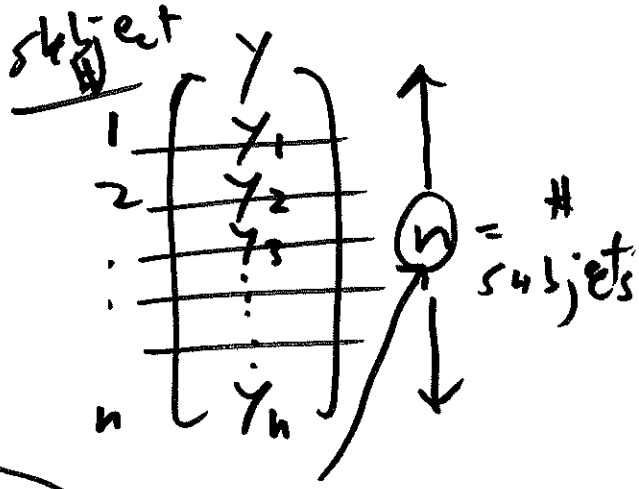
(II) correct conclusion

that cancer killed someone might have increased from 1970 to 1985

better measure.

(5) year remission (or survival) rate





mean of Y

$$= \frac{y_1 + y_2 + \cdots + y_n}{n} = \bar{y} \text{ ("y bar")}$$

capital sigma

$$\bar{y} = \frac{1}{n} \sum_{i=1}^{n} y_i$$

index of summation

2 (a)(i) $\sum_{i=1}^{3} 1 = 1 + 1 + 1 = 3$

(ii) $\sum_{i=1}^{n} 1 = \underbrace{1 + 1 + \ldots + 1}_{n} = n$

(iii) $\sum_{i=1}^{5} i = 1 + 2 + 3 + 4 + 5 = 15$

(v) $\sum_{i=1}^{n} (y_i + c) = (y_1 + c) + (y_2 + c) + \ldots + (y_n + c)$

$= (y_1 + y_2 + \ldots + y_n) + \underbrace{(c + c + \ldots + c)}_{n}$

$= \left(\sum_{i=1}^{n} y_i \right) + nc$