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BME533 : Homework 2

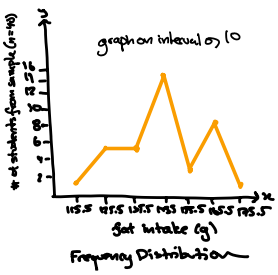
① a. Construct a frequency table by hand + plot

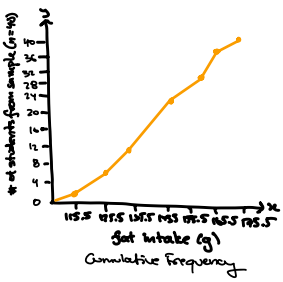
b. Cumulative Frequency

Sturges Principle: $1 + 3.3\log(40) = \text{ceiling}(6.2) = 7$ < sm. n → 120 / lg. n → 174

$\frac{R}{c} = \frac{174-170}{7} = 7.71 \Rightarrow$ we round to 10

class interval	Frequency	Cumulative Frequency
110 - 120	1	1
121 - 130	5	6
131 - 140	5	11
141 - 150	15	26
151 - 160	3	29
161 - 190	9	38
171 - 180	2	40
	40	





② For Cholesterol .txt File

Code:

a. mean: 202.78

b. median: 196

c. mode: 205

d. range: 208

e. Standard dev: 42.98

f. variance: 1847.24

g. 1st coefficient skew: 0.4736

h. 2nd coefficient skew: -0.521

③ Analyze pharmacokinetic parameters for women treated for anti-depressant

12 datapoints in kg: 62, 51, 56, 57, 67, 66, 60 61, 58, 60, 49, 71

a. mean: 59.836

b. median: 60.0

c. mode: 60.0

d. range: 22

e. variance: 36.805

f. std. dev.: 6.0667

g. 1st coef of var: -0.8241

} Calculated using the python code above

④ 10 people are selected to fill 5 vacancies, how many ways can the vacancies be filled?

$${}_{10}C_5 = \binom{10}{5} = \frac{10!}{5!(10-5)!} = \frac{10!}{5!(5!)} = \frac{3{,}628{,}800}{120\,(120)} = \boxed{252 \text{ ways to fill vacancy}}$$

⑤ Health Dept Receives 25 applicants. (10 > 30 y/o, 15 < 30 y/o), (17 = bachelor, 8 = grad), (6 => < 30 y/o and = grad). Prob person >30 OR master's

$$P(\text{Person over 30} \mid \text{Master's}) = \frac{10}{25} + \frac{6}{25} \boxed{= \frac{16}{25}} \text{ or } 0.64$$

(6) From a group of 6 men + 5 women, 4 persons are selected such that half are woman (2 of 4). In how many ways can this be done?

$${}_6C_2 = \frac{6!}{(6-2)!\,2!} = \frac{720}{(24)(2)} = 15$$

$${}_5C_2 = \frac{5!}{(5-2)!\,2!} = \frac{120}{6(2)} = 10$$

$${}_6C_2 * {}_5C_2 = 15 \cdot 10 = \boxed{150 \text{ combinations}}$$

(7) For Indigenous Maori People

P(exposed to plant based allergen in reality) = 0.6

P(allergic reaction | exposed) = 0.8

P(has been exposed to allergen) = $\frac{0.6}{0.8}$ $\boxed{= 0.75}$