CPT :-

MEXC	DIET	P(OB)	P(-OB)
NO	Bad	0.6	0.4
NO	Good	0.1	0.9
YES	Bad	0.1	0.9
YES	Good	0.05	0.95

From the model we know that obesity (OB) is dependent on two parent variables moderate Excercise (MEXC) and diet (DIET). so it will have total $2^2 = 4$ combinations in the CPT which are given.

we will calculate P(OB) by using bayes theorem and joint probability distribution.

Bayes theorem :-

$$P(B/A) = \frac{P(A/B)\,P(B)}{P(A)}$$

Joint Probability distribution :-

$$P(x_1, x_2 \ldots x_n) = \prod_{i=1}^{n} CP(x_i / Parent(x_i))$$

Now to calculate Prob. of obesity :-

all 4 combination considered

$P(OB) = P(OB \mid \text{NO MEXC, Bad diet}) * P(\text{no MEXC}) * P(\text{Bad diet})$
$+ P(OB \mid \text{NO MEXC, good diet}) * P(\text{no MEXC}) * P(\text{good diet})$
$+ P(OB \mid \text{Yes MEXC, bad diet}) * P(\text{Yes MEXC}) * P(\text{bad diet})$
$+ P(OB \mid \text{Yes MEXC, good diet}) * P(\text{Yes MEXC}) * P(\text{good diet})$

given in CPT

We take Prob. of MEXC and diet from user. Here let us consider.

$P(\text{NO MEXC}) = 0.5$ $P(\text{Bad diet}) = 0.4$
$P(\text{Yes MEXC}) = 0.5$ $P(\text{good diet}) = 0.6$

$\therefore P(OB) = (0.6) * (0.5) * (0.4) +$
$(0.1) * (0.5) * (0.6) +$
$(0.1) * (0.5) * (0.4) +$
$(0.05) * (0.5) * (0.6)$

$= 0.12 + 0.03 + 0.02 + 0.015$
$= 0.185$

so
$P(OB) = 0.185$
$P(\neg OB) = 0.815$

} calculated according to user input