**Question 12.1**

Describe a situation or problem from your job, everyday life, current events, etc., for which a design of experiments approach would be appropriate.

# Answer

Design of Experiments can be used to determine:

The combination of ingredients (factors) in soap making in a cosmetic manufacturing company that are more liked by the customers.

Here the different factors might be different kind essential oils and other soap organic and inorganic ingredients.

Here we can use fractional factorial design and may create about 15 different subsets of the ingredients and we can survey against 100 sample customers and record which combinations are best liked.

We need to have **control** of factors such as Age and gender among the customer samples.

We can also use **blocking factor** such as the purpose of the soap, is it medicinal to treat any illnesses or is it just used for regular use. This will reduce the variability in the estimates as the regular soaps might be more in demand.