1. There is a vast variety of aspects to life and social networks are merely one of them. It is reasonable to assume that using social networks (*SN*) does not affect someone's life to such an extent, that their happiness depends on it.

Hence, we can state *null hypothesis* as such:
using SN doesn't affect someone's happiness, so if someone stops using SN, their level of happiness is equally likely to increase or decrease depending on other not related factors.

In other words, if $\boldsymbol{p}$ is probability of level of happiness increasing after someone stops using SN, then $\boldsymbol{H_0}$ is that $\boldsymbol{p = \frac{1}{2}}$.

Alternative hypothesis would be that making a break in SN usage lets people have more time on live communication with relatives and close friends or other productive activities, which could potentially lead to an increase in level of happiness. So $\boldsymbol{H_1}$ states that $\boldsymbol{p > \frac{1}{2}}$.

2. Let $\boldsymbol{X}$ be random variable that models the number of participants, whose happiness level has increased. Then provided H_0 holds, $\boldsymbol{X}$ has Binomial distribution:

$$X \sim Binomial\left(n = 20, p = \frac{1}{2}\right)$$

3. Let $\boldsymbol{X_{obs} = 16}$ be the number of participants, whose level of happiness has increased, $\boldsymbol{\alpha = 0.05}$ – significance level.

Let's calculate ***p-value*** for X_{obs}.

$$p - value(X_{obs} = 16) = P(X \geq X_{obs}) = P(X \geq 16) =$$

$$= P(X = 16) + P(X = 17) + P(X = 18) + P(X = 19) + P(X = 20) =$$

$$= \binom{20}{16} \cdot \frac{1}{2^{20}} + \binom{20}{17} \cdot \frac{1}{2^{20}} + \binom{20}{18} \cdot \frac{1}{2^{20}} + \binom{20}{19} \cdot \frac{1}{2^{20}} + \binom{20}{20} \cdot \frac{1}{2^{20}} =$$

$$= \frac{1549}{262144} \approx \boldsymbol{0.0059}.$$

Taking into account level of significance $\boldsymbol{\alpha = 0.05}$ and seeing that $\boldsymbol{p\text{-}value < \alpha}$, we can conclude that there is ***strong evidence in favor of*** $\boldsymbol{H_1}$, so $\boldsymbol{H_0}$ **should be rejected**. Based on this data we would conclude that people are in fact becoming happier if they take a break from using social networks.