Two-sample T test Using excel

Let $x_1,\ldots,x_n$ and $y_1,\ldots,y_m$ are two independent random samples drawn from $N(\mu_x,\sigma_1^2)$ *and* $N(\mu_y,\sigma_2^2)$. To test equality of two population variances, we follow the steps below:

1- Setup the hypotheses

$$H_0:\ \mu_x = \mu_y$$

$$H_1:\begin{cases}\mu_x \neq \mu_y\\ \mu_x > \mu_y\\ \mu_x < \mu_y\end{cases}$$

2- Calculate the test p-value (this value can by calculated using excel)

3- Decision: reject H0 if p-value $\leq \alpha$, otherwise accept H0, where α is the significance level

Example:

Let $x_1,\ldots,x_n$ and $y_1,\ldots,y_m$ are two independent random samples drawn from $N(\mu_x,\sigma_1^2)$ *and* $N(\mu_y,\sigma_2^2)$, respectively. Test whether the means of the populations X and Y are equal in two cases

(i) The variances are equal
(ii) The variances are not equal

X	Y
77	79
30	38
25	84
30	45
44	85
40	76
65	62
44	44
77	42
75	77
	36
	85