REPORT AND ANALYSIS:

This analysis has been done for **Dataset 18** given in assignment sheet. For the two datasets, we evaluated how the the different menus's performance differed from one another in terms of time in dataset 1 and in terms of time and error in dataset2. The range of p-value varies from 0 to 1. A small p-value (typically **≤ 0.05**) indicates strong evidence against the null hypothesis, so you reject the null hypothesis. A large p-value (> **0.05**) indicates weak evidence against the null hypothesis, so you fail to reject the null hypothesis. Here our null hypothesis can be that that user's experience based on time taken and error rate does not differ significantly among various menus. Alternate hypothesis can be that user's experience changes significantly. Dataset 1 is for between group experiment and dataset 2 is for within subject experiment.

Dataset-1

Pairwise T-Test for DataSet-1

Results:

	controlmenu	flowmenu	Tool glass
flowmenu	1.00		
toolglass	1.00	1.00	
toolpalette	0.16	1.00	0.46

For pairs:

flowmenu and controlmenu,

toolglass and controlmenu,

toolglass and flowmenu,

toolpalette and flowmenu,

Value came out to be 1 so the performance of various these menus are not statistically different from each other. The adjustment method used for P value adjustment here was Bonferroni.

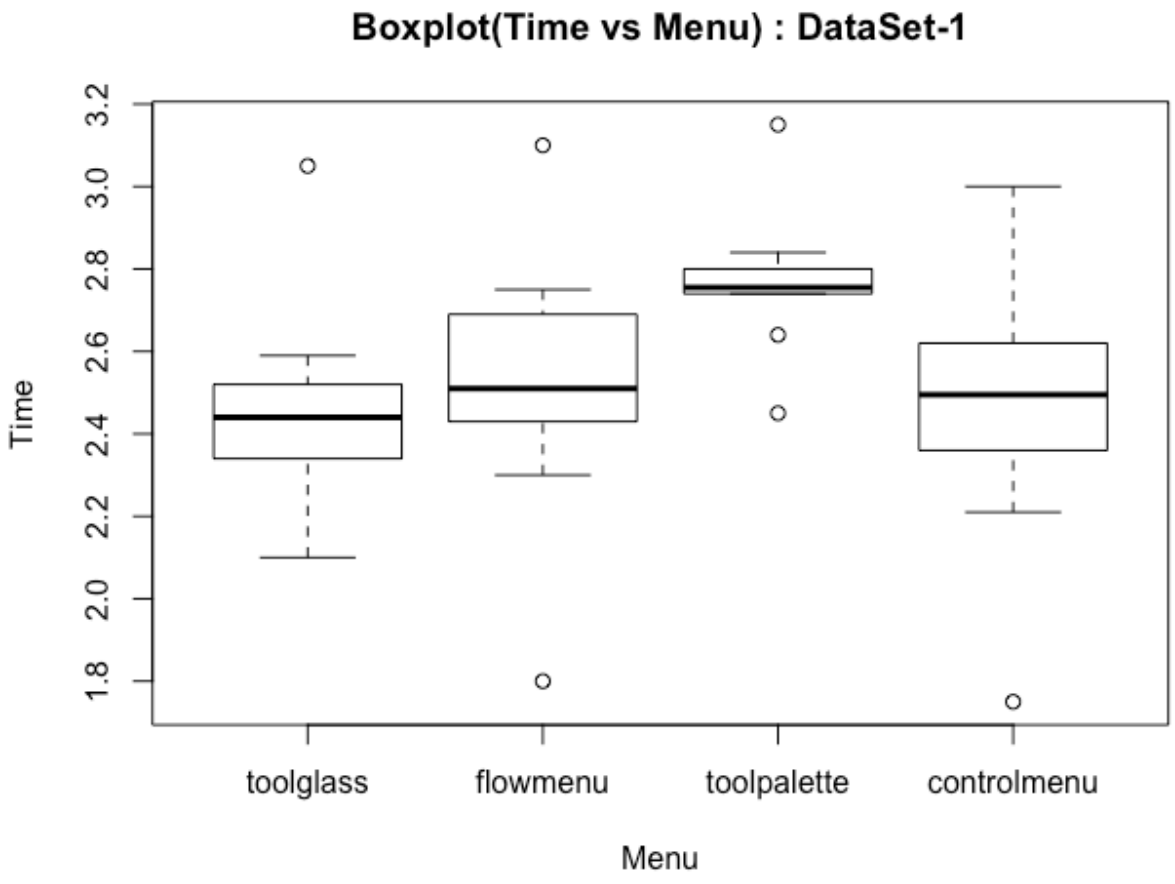
Anova Test for DataSet-1

	Df	Sum Sq	Mean sq	F value	Pr(>F)
Menu	3	0.542	0.1808	1.978	0.135
Residuals	36	3.290	0.0914		

From the Anova test we can see that $F(3,36) = 1.978$, $p = 0.131$. Since p value > 0.05 , there is no significant difference in the performance for different menu styles in terms of time.

Graphical report:

Following is the graph plotted between menu and time for dataset 1 where dark line depicts mean.



Dataset-2

Pairwise T-Test for DataSet-2

i.) Data:

time vs menu:

	controlmenu	flowmenu	Tool glass
flowmenu	1.00		
toolglass	1.00	1.00	
toolpalette	0.009	0.037	3.6E-05

For pairs:

flowmenu and controlmenu,

toolglass and controlmenu,

toolglass and flowmenu,

Value came out to be 1 so the performance of these menus (based on time) are not statistically different from each other.

For pairs:

toolpalette and controlmenu,

toolpalette and toolglass,

toolpalette and flowmenu,

Value is less than 0.05 and so the performance of these menu (based on time) is significantly different.

ii.) Data:

error vs menu:

	controlmenu	flowmenu	Tool glass
flowmenu	1.00		
toolglass	0.00049	0.00516	

	controlmenu	flowmenu	Tool glass
toolpalette	1.00	1.00	0.00064

For pairs:

flowmenu and controlmenu,

toolpalette and controlmenu,

toolglass and controlmenu,

Value came out to be 1 so the performance of these menus (based on error) are not statistically different from each other.

For pairs:

toolglass and flowmenu,

toolglass and controlmenu,

toolpalette and toolglass,

Value is less than 0.05 and so the performance of these menu (based on error) is significantly different.

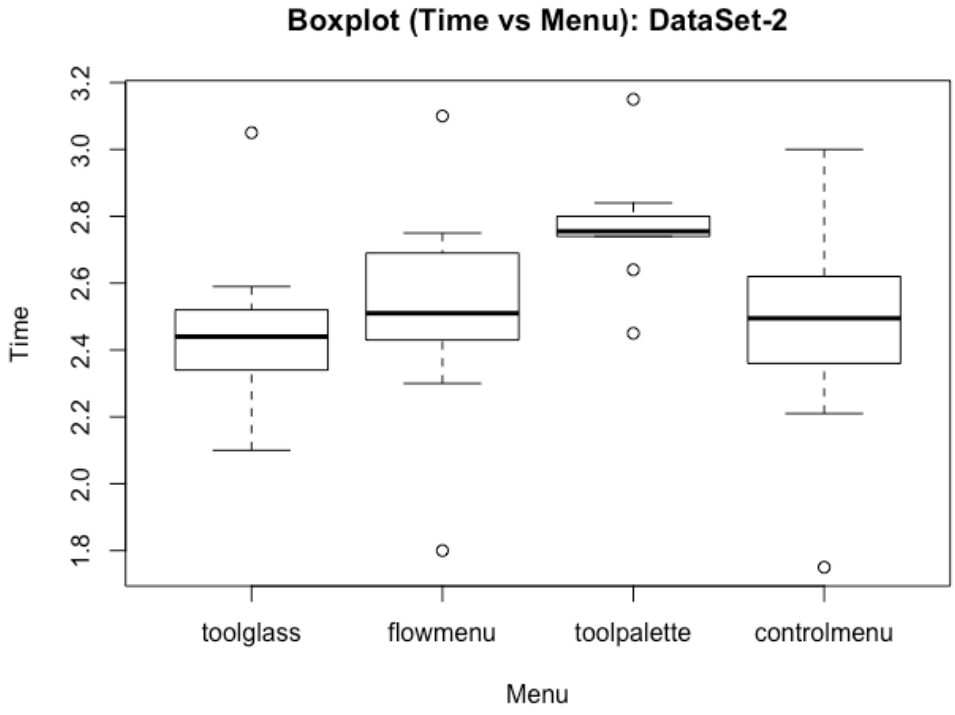
Manova Test for DataSet-2

	Df	Pillai	Approx F	Num Df	Den Df	Pr(>F)
Menu	3	0.34626	2.2334	6	64	0.051
Residuals	32					

From the Manova test we can see that $F(3,32) = 2.2334$, $p = 0.051$. Since p value > 0.05 , there is no significant difference in the performance for different menu styles. However, the value is very close to 0.05 but for p values equal to 0.05 and greater, we still consider the difference insignificant and do not reject null hypothesis.

Graphical report:

Following is the graph plotted between menu and time for dataset 2 where dark line depicts mean.



Following is the graph plotted between menu and error for dataset 2: