

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA SURATHKAL

DEPARTMENT OF INFORMATION TECHNOLOGY

IT351 - Human-Computer Interaction

Lab Assignment -2: Fitts' law and Hick's Law

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1)Fitts' law

Fitts' law states that the amount of time required for a person to move a pointer (e.g., mouse cursor) to a target area is a function of the distance to the target divided by the size of the target. Thus, the longer the distance and the smaller the target's size, the longer it takes

filtz law demo-

Index page-

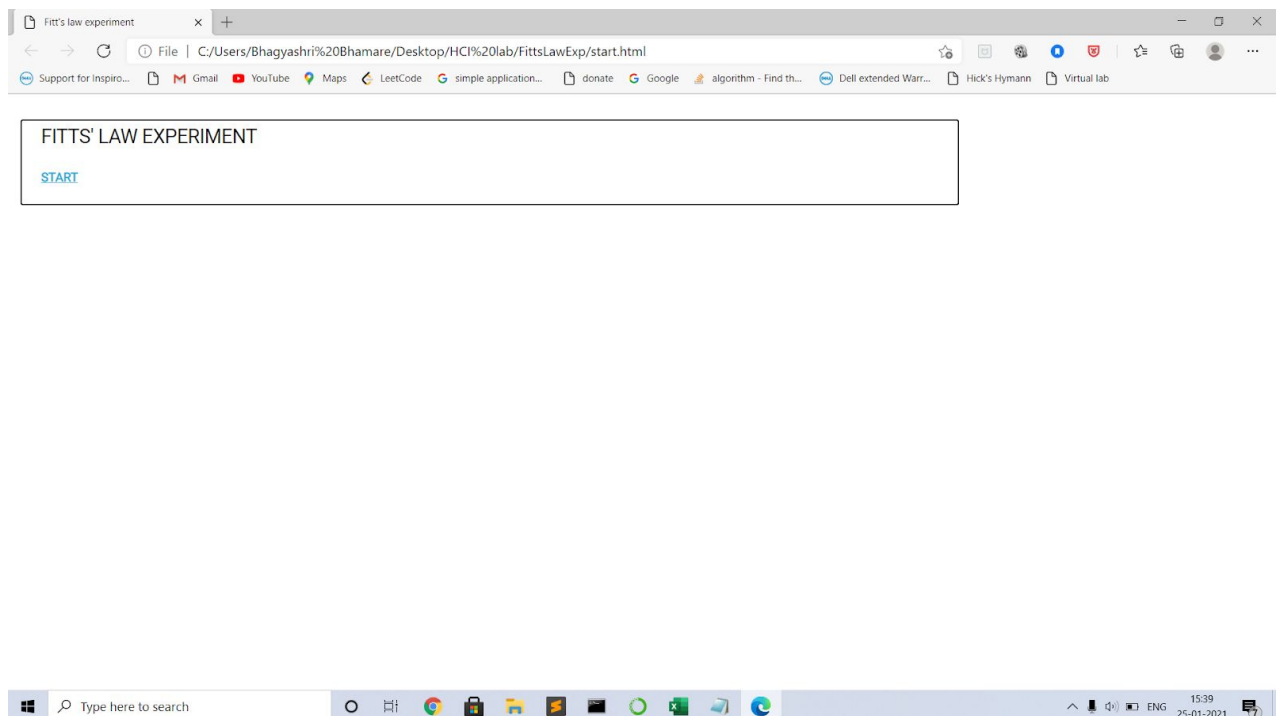


Fig-1 index page

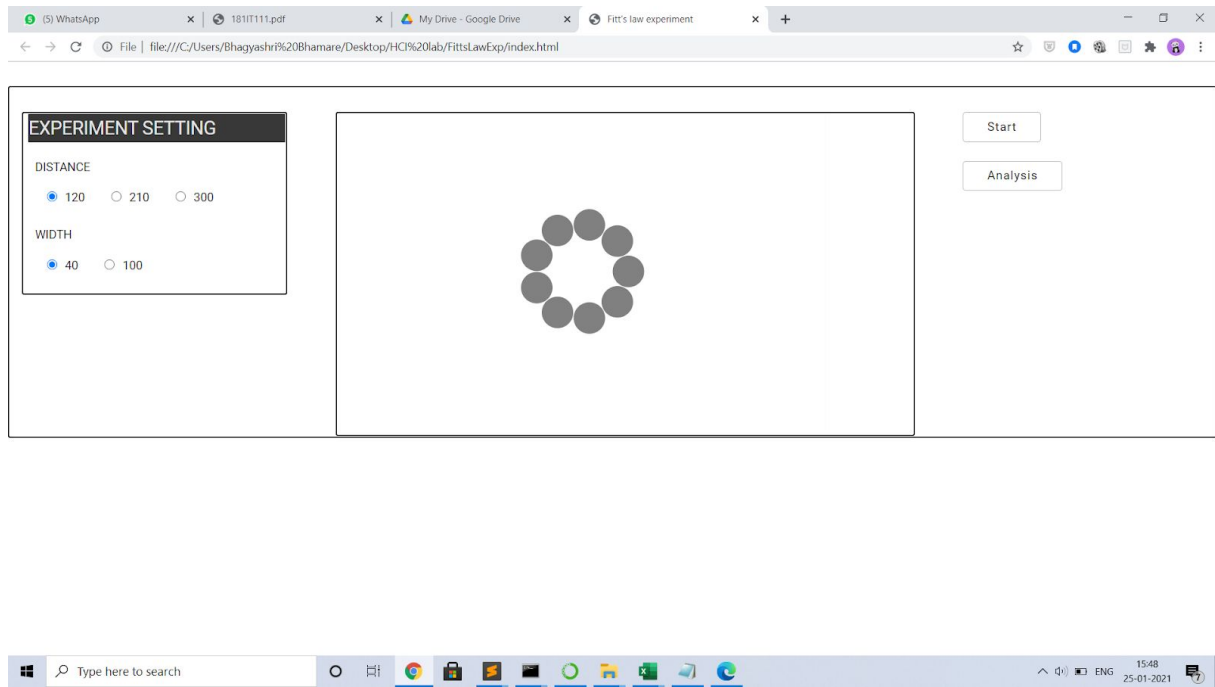


Fig-2 experiment with dis=120 and width=40

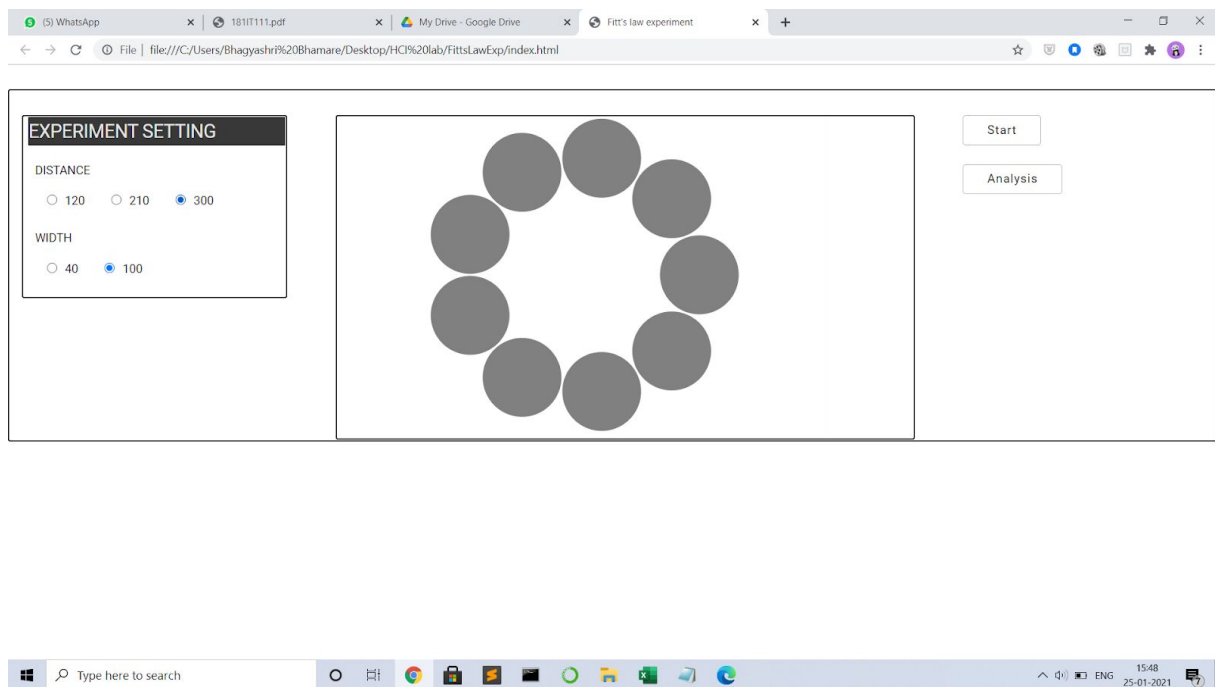


Fig-3 experiment with dis=300 and width=100

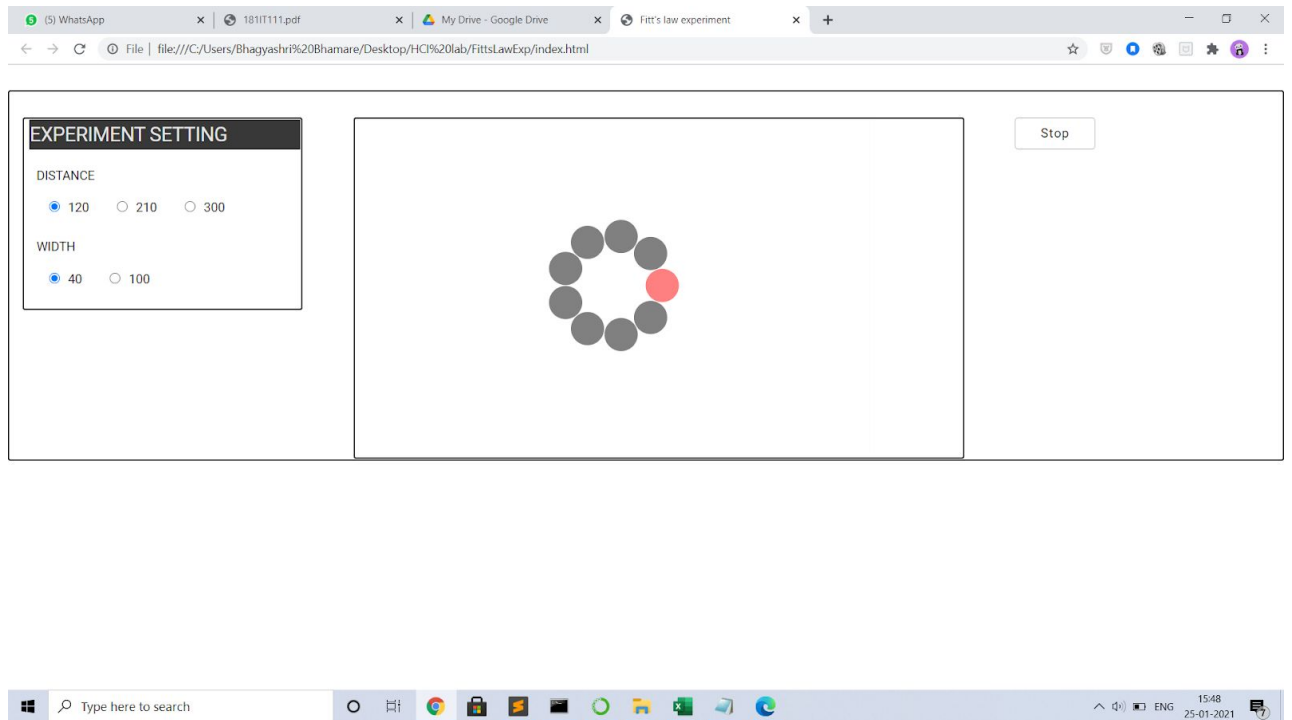


Fig-4 User selecting options

A	B	C	D	E	F
210	40	2.643856	0.9295	2.844385	
120	40	1.0676	1.873361		
300	40	3.087463	1.0926	2.825794	
300	100	2	0.9196	2.174859	
210	100	1.632268	0.8073	2.021886	
120	100	1.137504	1.19	0.955885	

Fig-5 Analysis

Experiment Result-

Result from the experiment

A	W	ID	MT	IP
210	40	2.643856	0.9295	2.844385
120	40	2	1.0676	1.873361
300	40	3.087463	1.0926	2.825794
300	100	2	0.9196	2.174859
210	100	1.632268	0.8073	2.021886
120	100	1.137504	1.19	0.955885

Experiment analysis on different users

USERS	Throughput
PERSON01	6.19
PERSON02	4.79
PERSON03	5.34
PERSON04	5.42
PERSON05	5.83

PERSON06	5.65
PERSON07	5.05
PERSON08	6.62
PERSON09	6.09
PERSON10	6.4
PERSON11	5.94
PERSON12	8.3
PERSON13	6.17
PERSON14	5.88
PERSON15	7.76
PERSON16	8.84

Graphical representation of the data

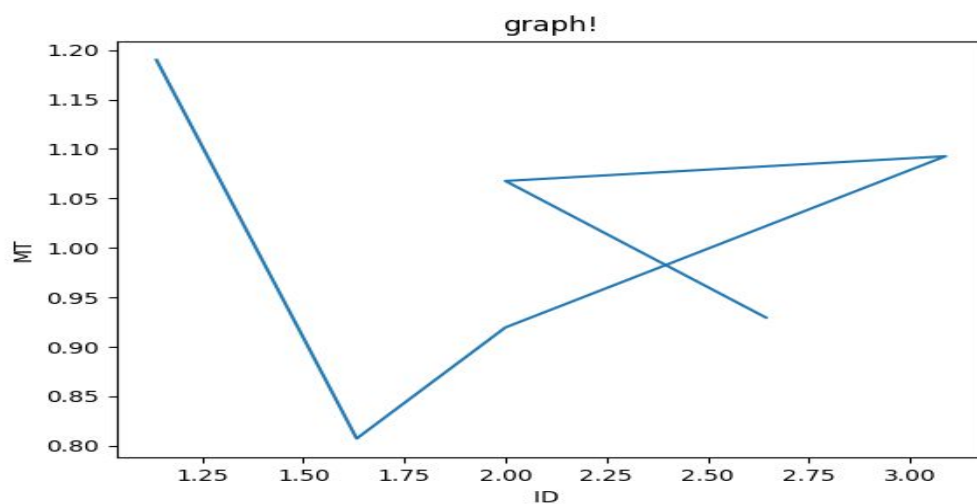


Fig6- Scatter plot and least-squares regression analysis

Results and Conclusion

Throughput was calculated using the Shannon formulation for ID along with A_e and W_e . The mean for throughput is 6.85. All participants had higher throughput for the task. Throughput was fairly flat over the five blocks of testing with < 3% change in throughput from block 1 to block 5. The higher throughput for the condition With side-to-side movement. Movements in the condition are more complicated, since the direction of movement changes by $360^\circ / 20 = 18^\circ$ with each trial. Furthermore, occlusion is unavoidable for some trials in a sequence.

2) Hick's Law (or the Hick-Hyman Law) - this pair set out to examine the relationship between the number of stimuli present and an individual's reaction time to any given stimulus. As anyone should expect, the more stimuli to choose from, the longer it takes the user to make a decision on which one to interact with. Users bombarded with choices have to take time to interpret and decide, giving them work they don't want.

Hick's Law demo-

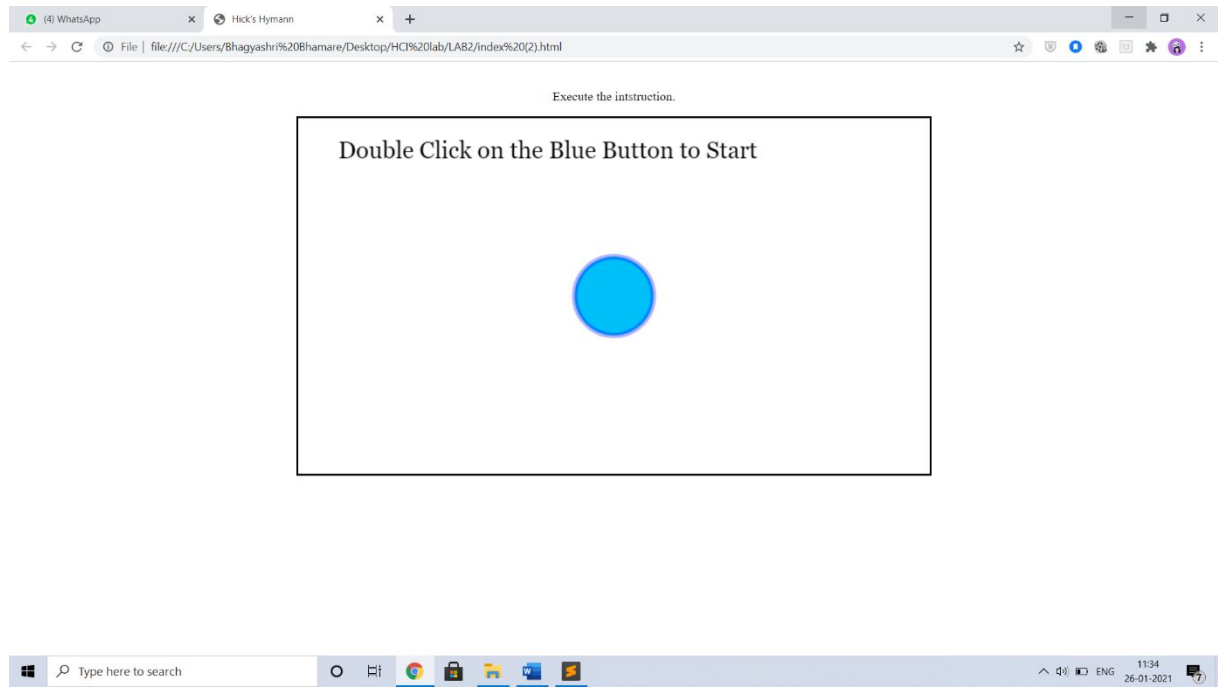


Fig-1 Index Page

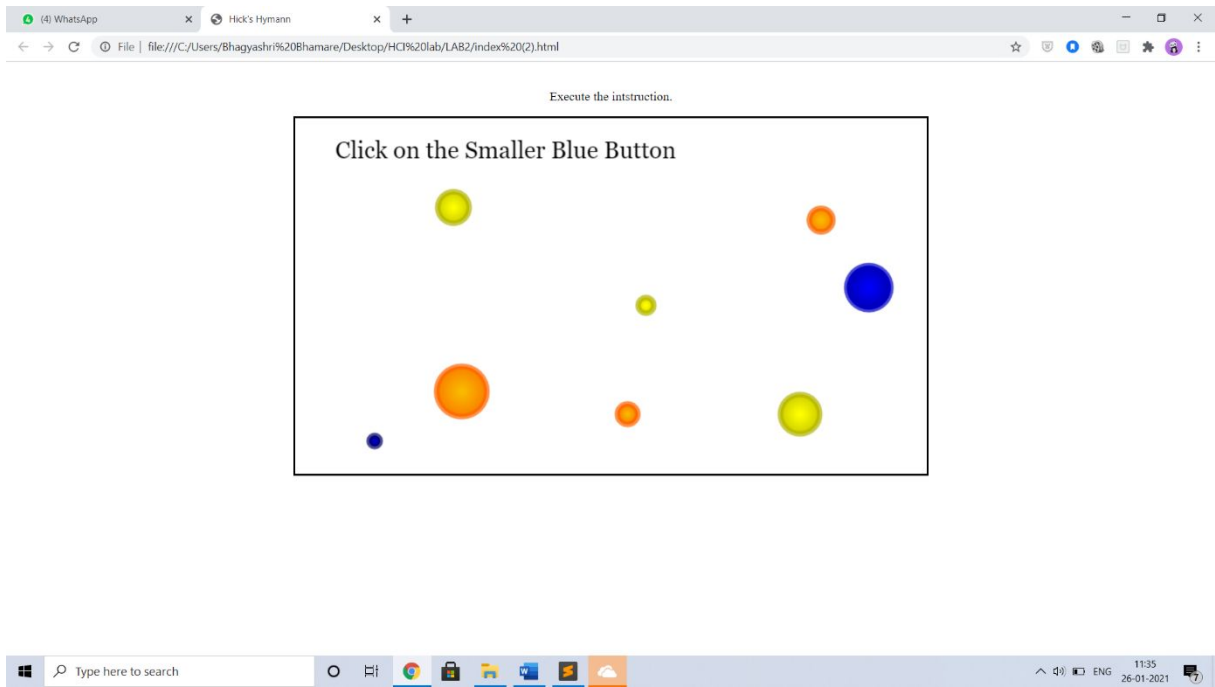


Fig-2 User performing Different Instruction

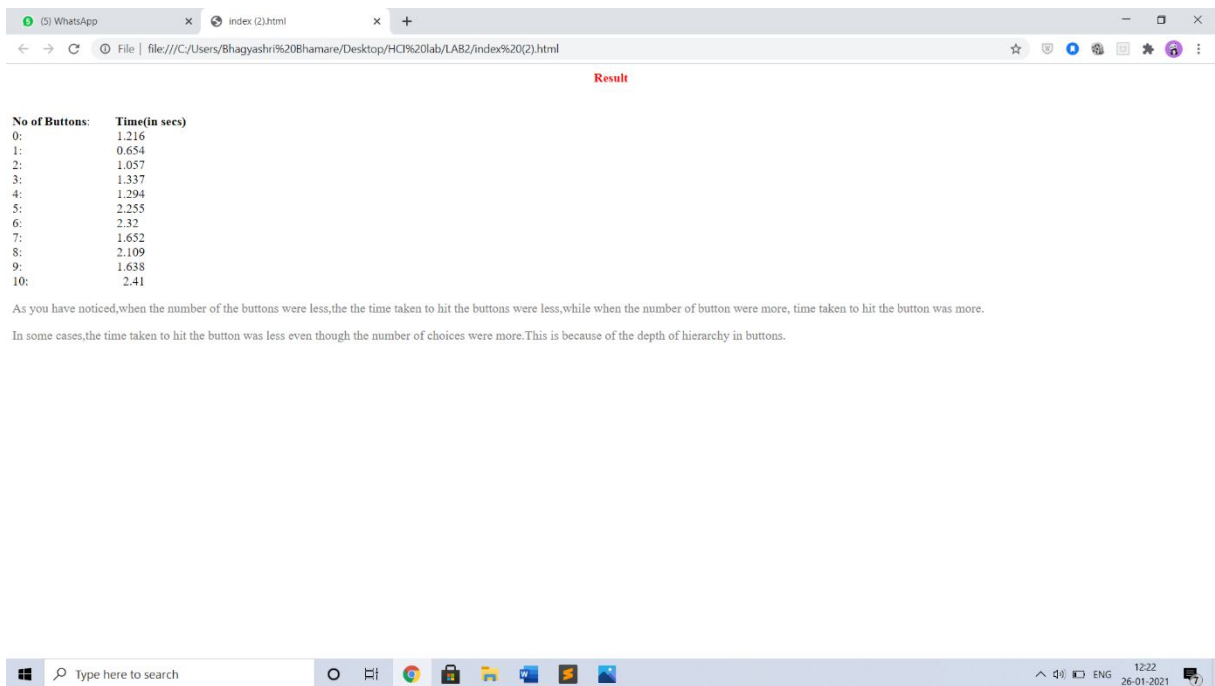


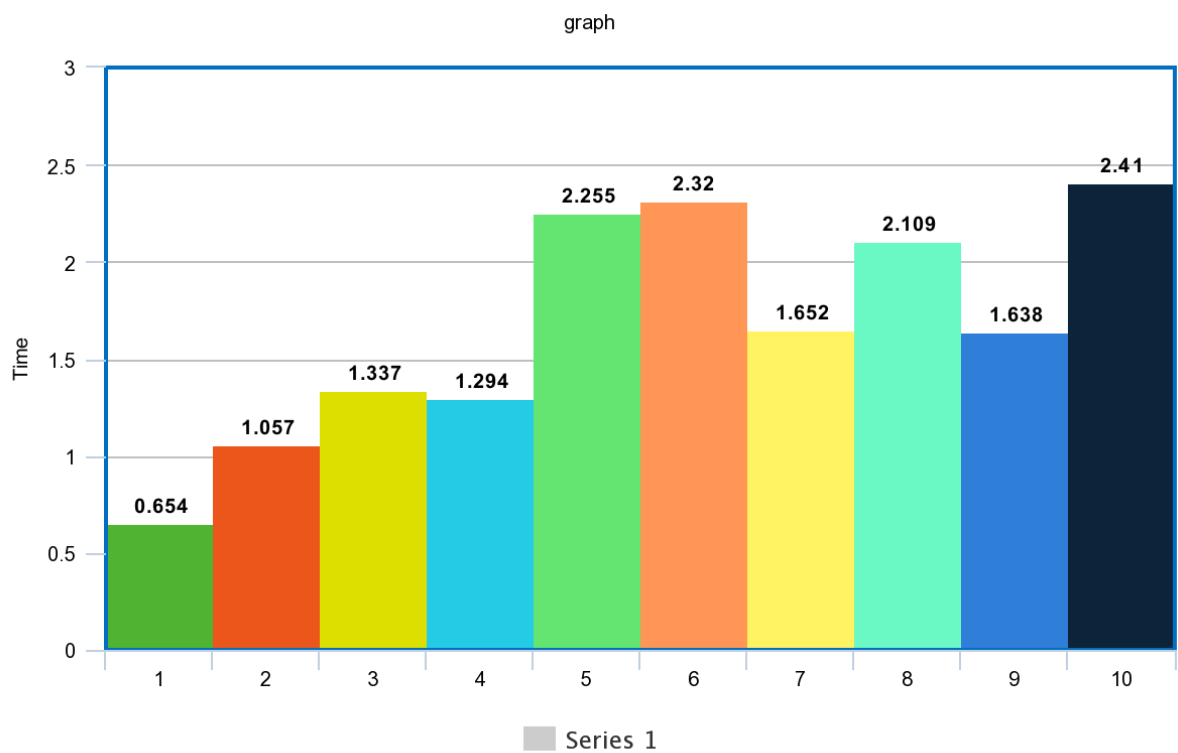
Fig-2 Time taken for the all instruction

Results-

Time required for all the instruction-

1:	0.654
2:	1.057
3:	1.337
4:	1.294
5:	2.255
6:	2.32
7:	1.652
8:	2.109
9:	1.638
10:	2.41

Graphical Representation-



Conclusion-

1)As you have noticed, when the number of the buttons were less, the time taken to hit the buttons were less, while when the number of buttons were more, time taken to hit the button was more.

2)In some cases, the time taken to hit the button was less even though the number of choices were more. This is because of the depth of hierarchy in buttons.

3)For the big buttons required less time compared to the small buttons