Accuracy Analysis

Data Processing

Each participant's accuracy was calculated by comparing the total amount of numbers displayed with the correct numbers they identified. Omissions were treated as errors, thus affecting the overall accuracy scores.

Calculation of Individual Accuracies

Individual accuracies were computed for each participant across three conditions: easy (3 digits), medium (5 digits), and hard (8 digits). This data was then compiled to assess performance variations based on the task difficulty.

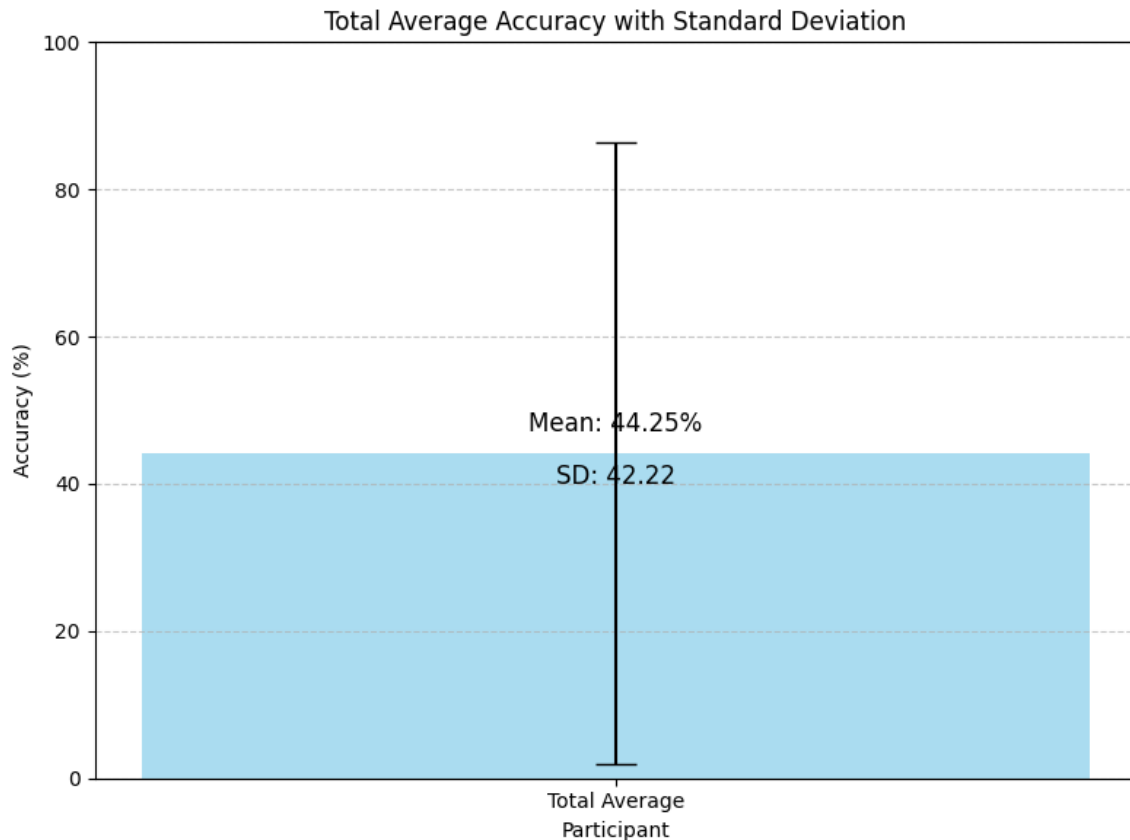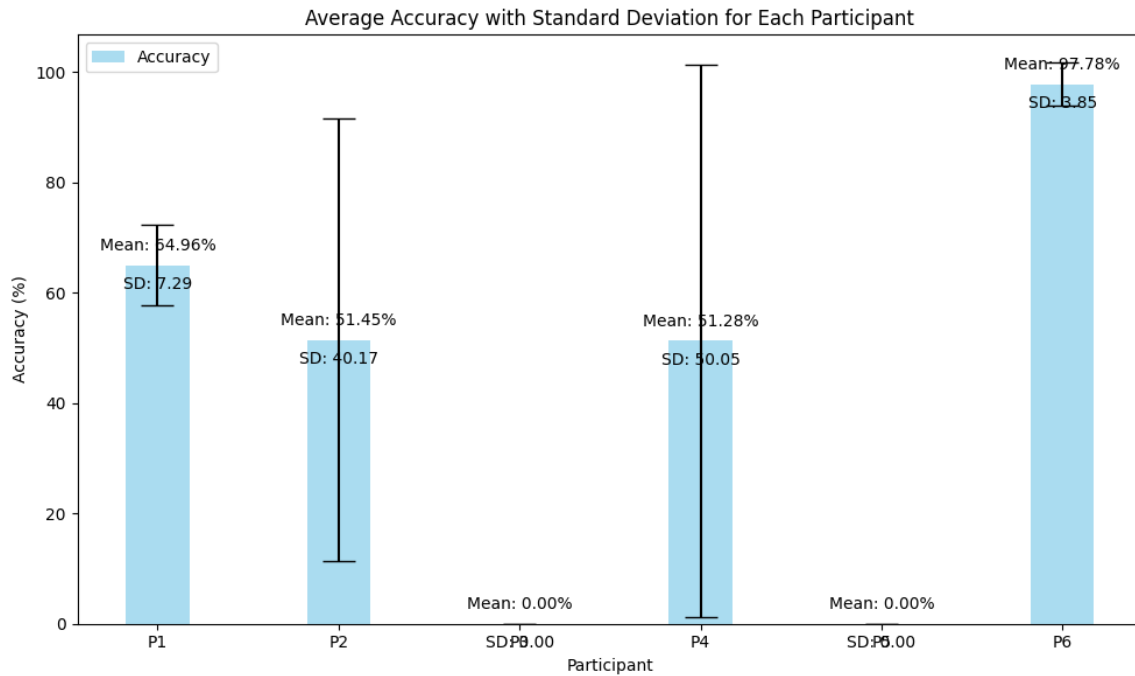| Participant	Condition (Digits)	Accuracy (%)
P1	Easy (3 digits)	73.33
P1	Medium (5 digits)	60
P1	Hard (8 digits)	61.54
P2	Easy (3 digits)	86.67
P2	Medium (5 digits)	60
P2	Hard (8 digits)	62.96
P3	Easy (3 digits)	0
P3	Medium (5 digits)	0
P3	Hard (8 digits)	0
P4	Easy (3 digits)	83.33
P4	Medium (5 digits)	50
P4	Hard (8 digits)	20.51
P5	Easy (3 digits)	0
P5	Medium (5 digits)	0
P5	Hard (8 digits)	0
P6	Easy (3 digits)	86.67
P6	Medium (5 digits)	84.44
P6	Hard (8 digits)	98.22

Overall Performance Metrics

Here, we computed the mean and standard deviation of accuracies across all participants for each condition. The results are as follows:

- **Easy Condition**: Average accuracy was approximately 58.89% with a high standard deviation of 46.46%, indicating significant variability in participant performance.
- **Medium Condition**: Average accuracy decreased to around 45.64% with a standard deviation of 38.99%, reflecting increased task difficulty.
- **Hard Condition**: Average accuracy further dropped to 28.21%, with a standard deviation of 42.60%, showcasing substantial challenges faced by participants in the hardest setting.

Visualization

A bar chart was created to illustrate the average accuracies for each condition, with error bars representing the standard deviations.

Average Accuracy with Standard Deviation for Each Participant

Overall Accuracy of Each Participant

The overall accuracy for each participant was calculated across all conditions. The results are as follows:

Participant	Overall Accuracy (%)
P1	64.96
P2	51.45
P3	0
P4	51.28
P5	0
P6	97.78

Observation

The total average accuracy of 44.25% across all participants and digit sequence lengths (3, 5, and 8 digits) highlights the overall performance of the transcription or recognition process. This metric indicates the general level of correctness achieved. The relatively modest average suggests that there is substantial room for improvement in the data processing methodologies, potentially leading to more accurate and reliable outcomes.

Accuracy of Participants for the whole Experement
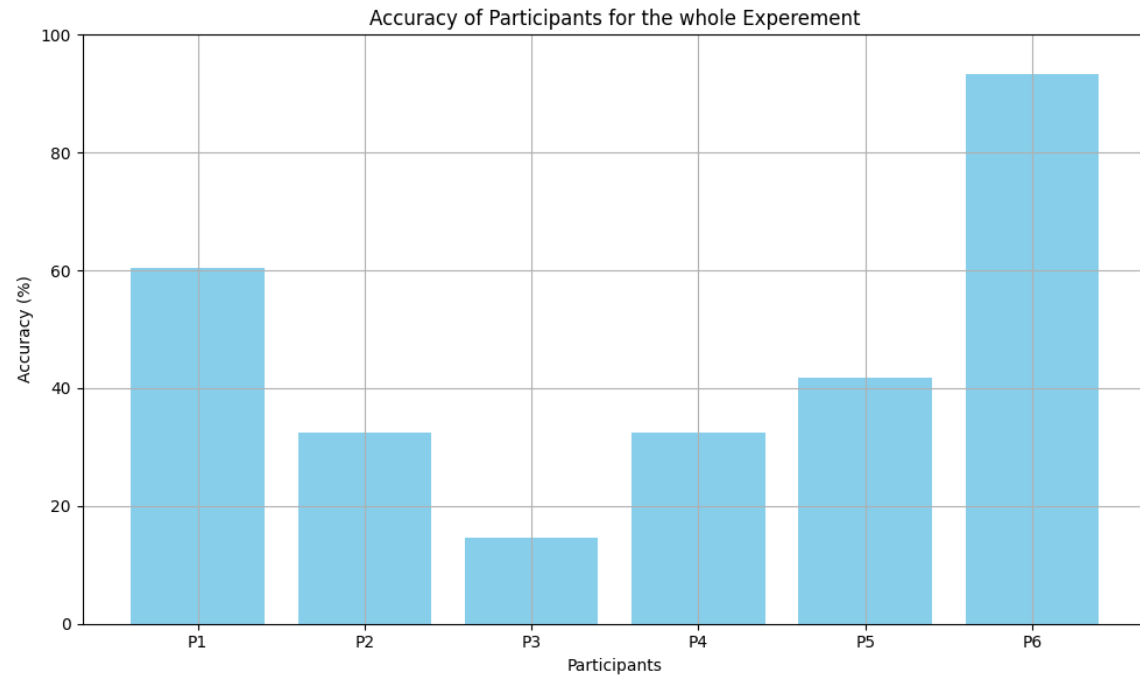
Count the blinks of each participant in each condition

We'll start by examining the provided blink rate data for each participant under the three conditions: easy, medium, and hard.

participant	Blink rate	condition
p1	57	easy
p1	264	easy
p1	75	medium
p1	212	medium
p1	43	hard
p1	211	hard
p2	40	easy
p2	596	easy
p2	552	medium
p2	41	hard
p2	574	hard
p3	32	easy
p3	508	easy
p3	517	medium
p3	517	hard
p4	678	easy
p4	117	easy
p4	409	medium
p4	38	hard

p4	547	hard
p5	580	easy
p5	88	easy
p5	366	medium
p5	62	hard
p5	682	hard
p6	17	easy
p6	858	easy
p6	725	medium
p6	329	hard

Overall Performance Metrics for Blink Rates

Data Summary: The dataset represents the average blink rates for each participant across three conditions: easy, medium, and hard. These averages were calculated based on the number of blinks recorded during tasks of varying digit counts, which were classified into the three conditions based on their complexity.

participant	condition	average blink rate
p1	easy	160.5
p1	medium	143.5
p1	hard	127
p2	easy	318
p2	medium	552
p2	hard	307.5
p3	easy	270
p3	medium	517
p3	hard	517
p4	easy	397.5
p4	medium	409
p4	hard	292.5
p5	easy	334
p5	medium	366
p5	hard	372
p6	easy	437.5
p6	medium	725
p6	hard	329

Observations

Across all participants, we observe an increase in blink rates as the tasks increase in complexity from easy to medium but a varied response from medium to hard. This

inconsistency might suggest that while the medium tasks require more cognitive effort compared to easy tasks, the hardest tasks might involve a level where the cognitive load stabilizes or involves different strategies that do not linearly increase blink rates.

Average Blink Counts for Each Digital Count