Assignment – 1

Name: Anik Biswas

ID : 011192052

Course: Human Computer Interaction

Section: B

1.i. Identified violations:

(i) Visibility of system status
(ii) Match between system and the real world.
(iii) User control and freedom.
(iv) Recognition rather than recall.
(v) Error prevention

1.ii. Explanation of violations and solutions

(i) Visibility of system status–

Violation: No loading indicator when the internet connection is slow, making users unsure if the app is working.

Solution: Add a loading spinner or progress bar when fetching data.

(ii) Match between system and the real world–

Violation: The home screen only shows the temperature without context like location and time, which is unnatural.

Solution: Display the current location, time of update, and a short weather summary for better context.

(iii) User control and freedom –

Violation: Users cannot return to the home screen easyly; they must colose and reopen the app.

Solution: Introduce a back button or gesture-based navigation for easy access to the home screen.

(iv) Recognition rather than recall –

Violation: The forecast icon is small and unlabeled, making it hard for users to find

Solution: Use a clear label or tooltip indicating that the icon leads to the forcast.

(v) Error prevention :–

Violation: Terms of service pop-up forces users to scroll through the entire document before dismissing it.

Solution: Allow users to skip or acknowledge the terms without forced scrolling.

2.a. Hipothesis testing is a statistical method used to determine if there is enough evidence in a sample to infer that a certain condition is true for a population. It helps in making data-driven decisions.

Null Hypothesis (H_0): The default assumption that there is no effect or difference.

Alternative Hypothesis (H_1): The assumption that there is a significant effect or difference.

Example:

- H_0: A new drug has no effect on blood pressure.
- H_1: The new drug significantly lowers blood pressure.

2.b.

① Chi-Squared test -

Scenario: A researcher wants to know if customer satisfaction levels (satisfied, neutral, dissatisfied) depend on the type of mobile phone used (Android, iOS).

Variables:

Categorical: Customer satisfaction (3 levels)

categorical: Mobile phone type (2 levels)

(ii) Paired sample t-Test -

Scenario: A fitness instructor measures the weight of participants before and after a 3-month training program to check if the program was effective.

Variables:

Continuous: Weight before training

Continuous: weight after training

(iii) One-Way ANOVA -

Scenario: A company wants to compare the productivity levels of employees using three different work schedules: Morning shift, Evening shift, Night shift.

Variables:

Categorical: Work shift (3 levels)

Continuous: Prodetivity score

2.c. The p-value measures the probability of obtaining results as extreme as the observed results, assuming that the null hypothesis is true.

If $p < 0.05 \rightarrow$ Reject H_0 (Statistically significant result).

If $p \geq 0.05 \rightarrow$ Fail to reject H_0 (Not enough evidence to support H_1).

Example: If a p-value = 0.03 in a drug effectiveness test, it means there's only a 3% chance that the observed effect happened.

due to random chance, so we reject the null hypothesis and conclude the drug has a real effect.