

Name	Farhan-Ul-Haq
Sap id	55853
Submitted to	Sir, Usman Sharif
Subject	Human Computer
	Interaction & CG

#### Lab Number#13

Title: Color in Computer Graphics and HCI

## 1. Objective

The objective of this lab was to understand the application of **color theory**, **color models**, and **psychological impacts of color** in the design and evaluation of user interfaces in both computer graphics and human-computer interaction contexts.

## 2. Learning Outcomes

By the end of the lab, students were able to:

- Differentiate between **RGB** and **CMYK** color models.
- Apply color theory to interface design.
- Analyze the psychological and emotional impacts of different colors on users.
- Evaluate **accessibility** in interface design (e.g., contrast, color blindness).
- Apply **Gestalt principles** in color grouping and perception.

# 3. Theoretical Concepts

### 3.1 Color Models

Model	Туре	Used For	Description
RGB	Additive	Screens, UI	Combines Red, Green, Blue light
СМҮК	Subtractive	Printing	Uses Cyan, Magenta, Yellow, Black

## 3.2 Psychological Impact of Colors

Color	Emotion Triggered	HCI Application Example
Red	Alert, Danger, Passion	Error messages, warnings
Blue	Trust, Calmness	Login screens, banking apps
Green	Growth, Nature, Positivity	Success messages, eco-apps

# **3.3 Accessibility Considerations**

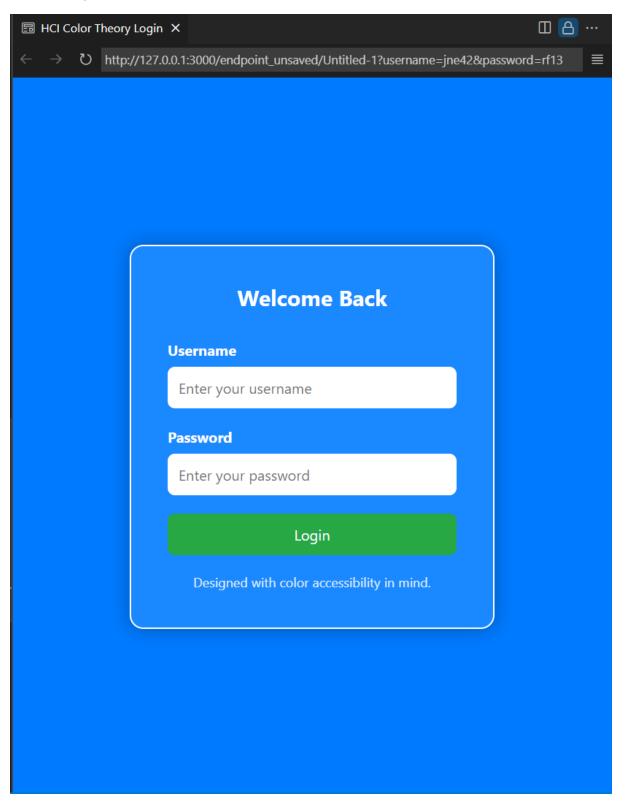
Challenge	Description	Tool/Solution
Color Blindness	Difficulty distinguishing certain colors	Use high contrast, patterns
Low Contrast	Hard to read interface elements	Follow WCAG guidelines
Cultural Perception	Colors interpreted differently across cultures	Use user-focused testing

## 4. Hands-on Activity Summary

# **Activity: Designing a Mobile App Login Screen**

• Selected a blue shade in RGB: R = 0, G = 122, B = 255.

- Analyzed its calm and trustworthy effect on users.
- Iteratively changed colors based on peer feedback and emotional response.



#### 5. Gestalt and Color Grouping

- Applied Gestalt principles such as similarity and proximity using color grouping.
- Highlighted important UI elements like CTA buttons with contrasting, noticeable colors.

#### 6. Accessibility Evaluation

- Used tools such as ColorZilla, Adobe Color, and WCAG Contrast
  Checker.
- Ensured a minimum contrast ratio of **4.5:1** for readability.
- Designed color palettes that support colorblind users by avoiding red-green combinations.

#### 7. Reflection

- **Emotional Response:** Learned how colors like red can invoke urgency, while blue creates trust.
- **Design Inclusiveness:** Understood that inclusive design involves considering users with different abilities.
- **Cultural Diversity:** Recognized that color meanings vary (e.g., white = purity in the West, mourning in some Asian cultures).

### 8. Summary Table

Component	Insights Gained
Color Models	RGB for screens, CMYK for print
Psychological Impact	Emotional and functional use of color

Accessibility	Importance of color contrast and color-blind safety
Gestalt Principles	Grouping and attention guidance using color
Real-world Application	App login screen color testing and user response

### 9. Additional Resources Consulted

- Adobe Color
- Coolors
- WCAG Guidelines
- Paletton
- ColorZilla Chrome Extension

## 10. Quiz/Knowledge Check (Sample)

Question	Answer
What model is used for screen colors?	RGB
What emotion is linked with the color blue?	Calmness, Trust
What guideline ensures color accessibility?	WCAG (Web Content Accessibility Guidelines)

### 11. Conclusion

This lab emphasized the crucial role of color in UI/UX design and its deeprooted psychological and functional implications. By exploring both theory and practical design exercises, I developed a stronger understanding of

how thoughtful color use can enhance usability, accessibility, and emotional connection in digital products.