



## Window Management with In-Air Gestures on Desktop Computers

Simon Walter - Timo Wilhelm

University of Applied Sciences Augsburg | Interaction Engineering | Prof. Dr. Michael Kipp | WS 2015/16

# Agenda

1. Problem
2. Related Work
3. Prototype
4. Gestures
5. Technical Demo

 **Problem** 

# Problem

Common window interactions with a mouse within computer operating systems are **not intuitive** & **interrupt the user's workflow**

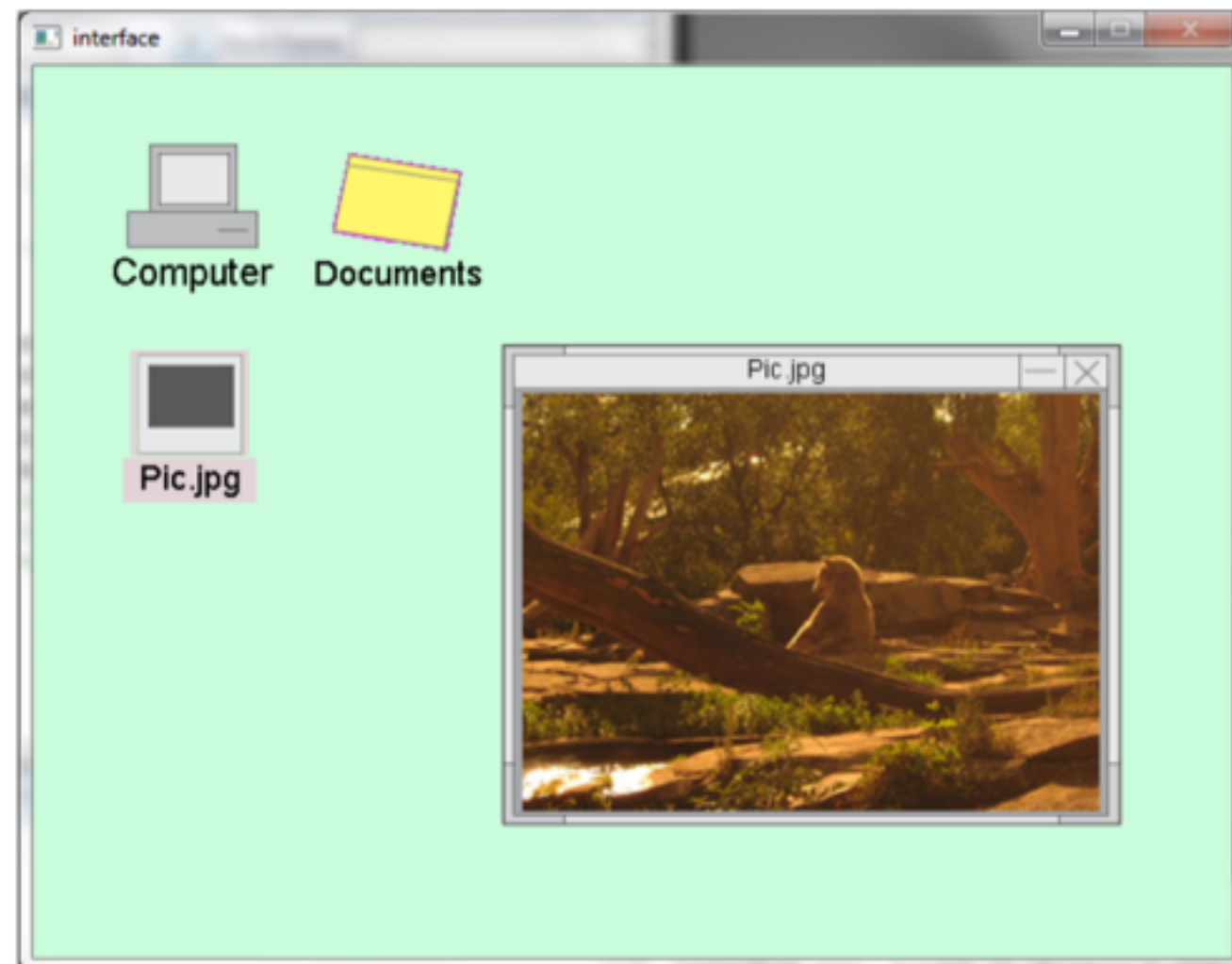
Possible Solution: **In-Air gestures**

*More intuitive and less distracting?*

# **Related Work**

# „Design and Usability Analysis of Gesture-Based Control for Common Desktop Tasks“

Farzin Farhadi-Niaki, S. Ali Etemad, Ali Ary (University of Ottawa/Carleton University)



## *Arm and finger gestures for interacting with a vision-based system*

1. Arm gestures cause more fatigue and appear less natural than finger gestures
2. 85% of participants pick an object on screen with the pinching gesture in their first guess
3. Most participants prefer “mostly finger” for interactions

# „On the usability of gesture interfaces in virtual reality environments“

Marcio C. Cabral, Carlos H. Morimoto, Marcelo K. Zuffo (University of Sao Paulo)



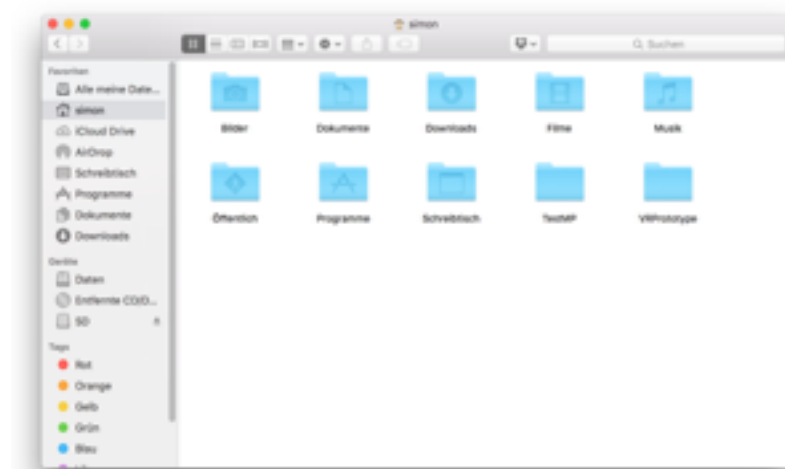
## *Use of gestures to control virtual reality environments*

1. Performance of tasks considerably worse than a mouse movement, mostly because of the lack of experience and the large number of gestures compared to a mouse
2. But subjective experiments proof that gestures are easy to learn and suitable for short and infrequent tasks

# **Prototype**



# Prototype



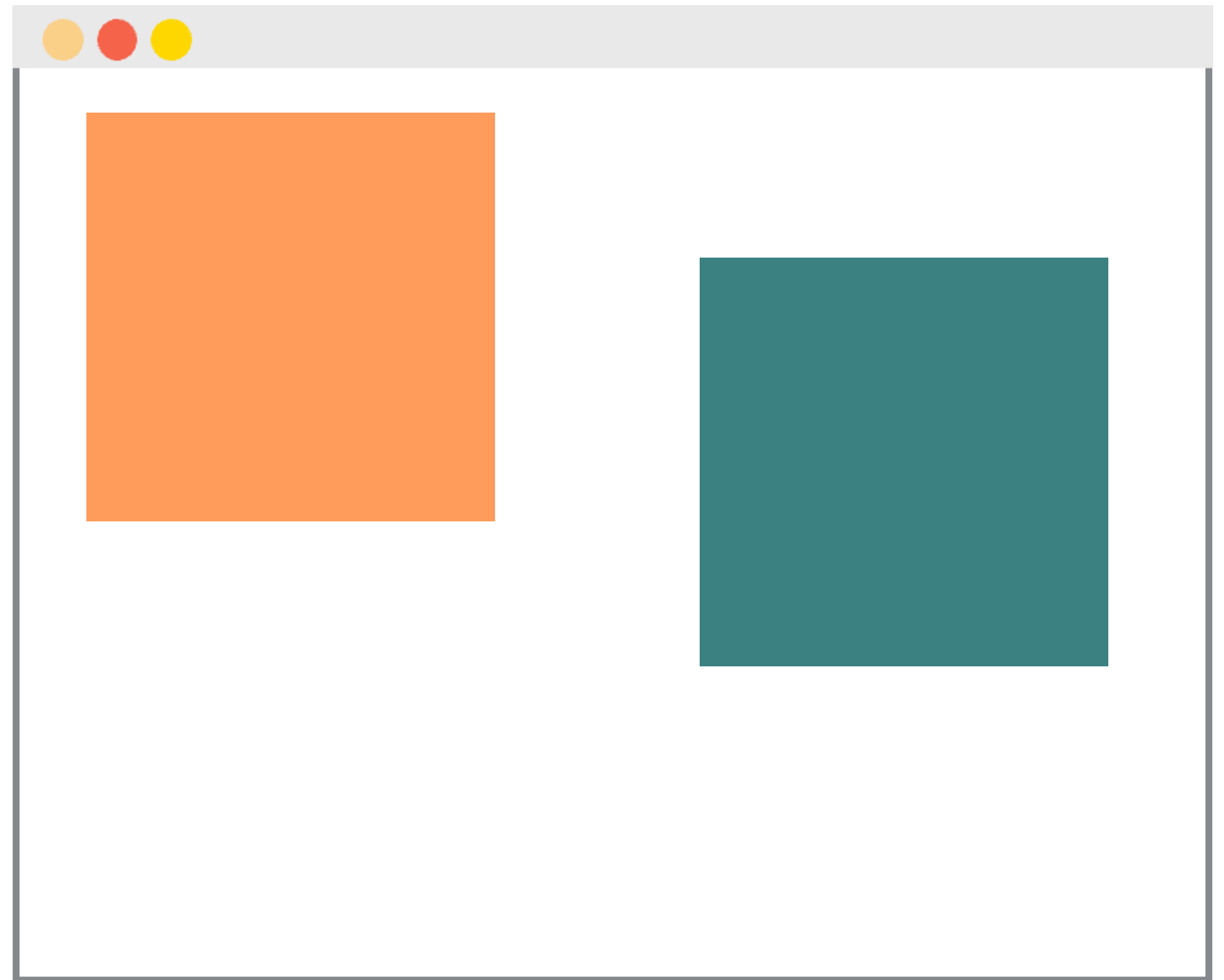
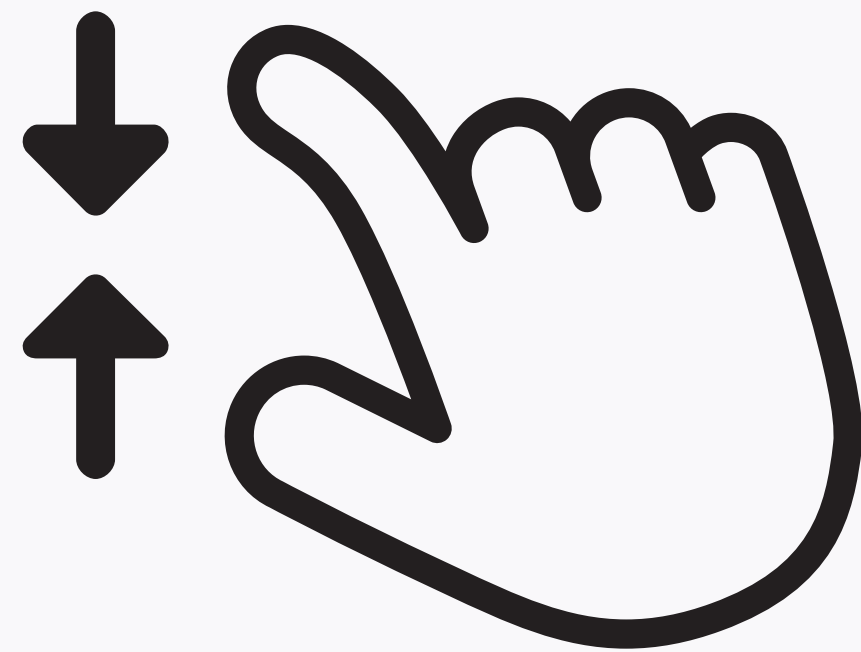
1. Simple OS User Interface built with Processing 3
2. Hand Gestures captured by a Leap Motion Controller
3. Gestures mapped to Window Management Functions



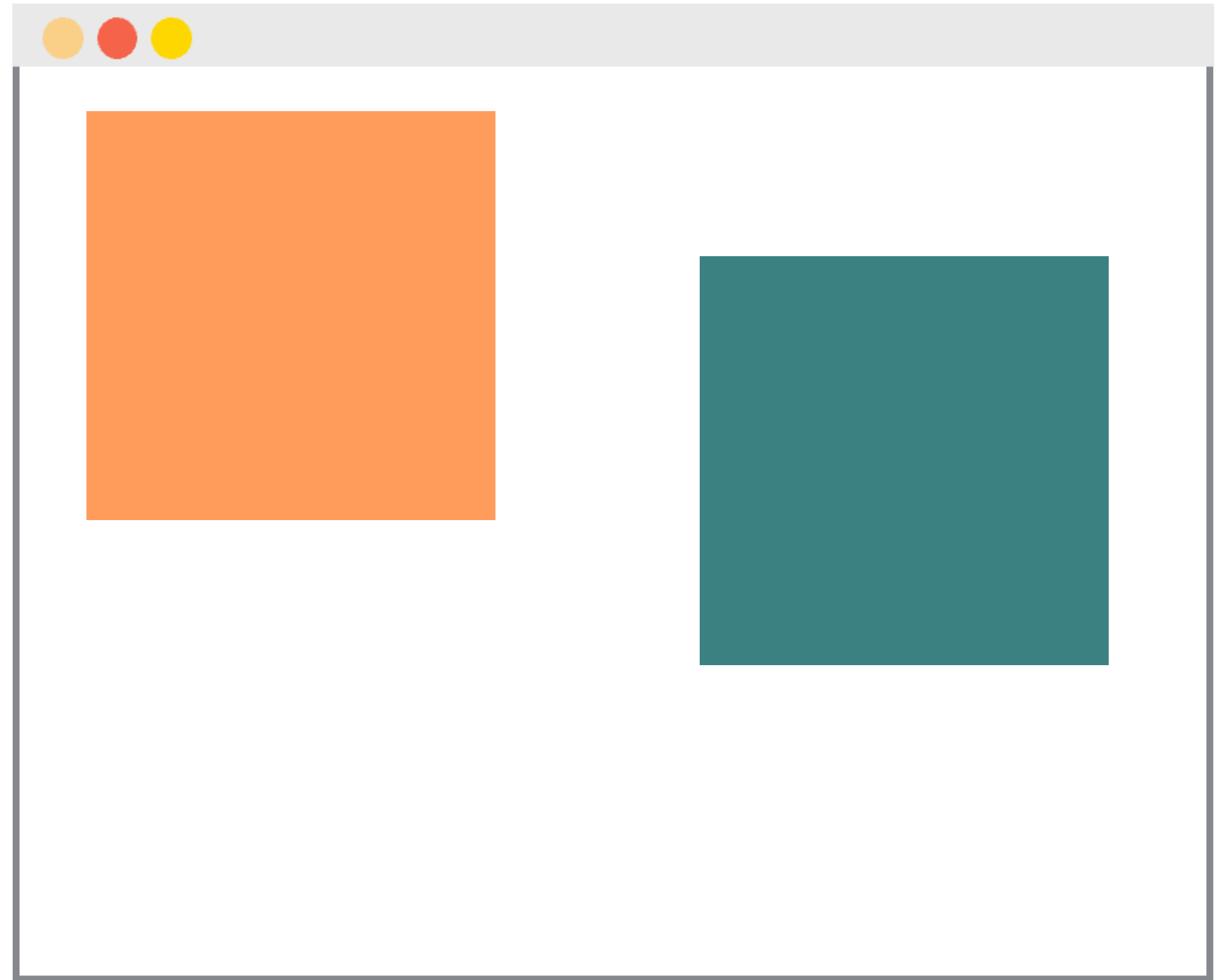
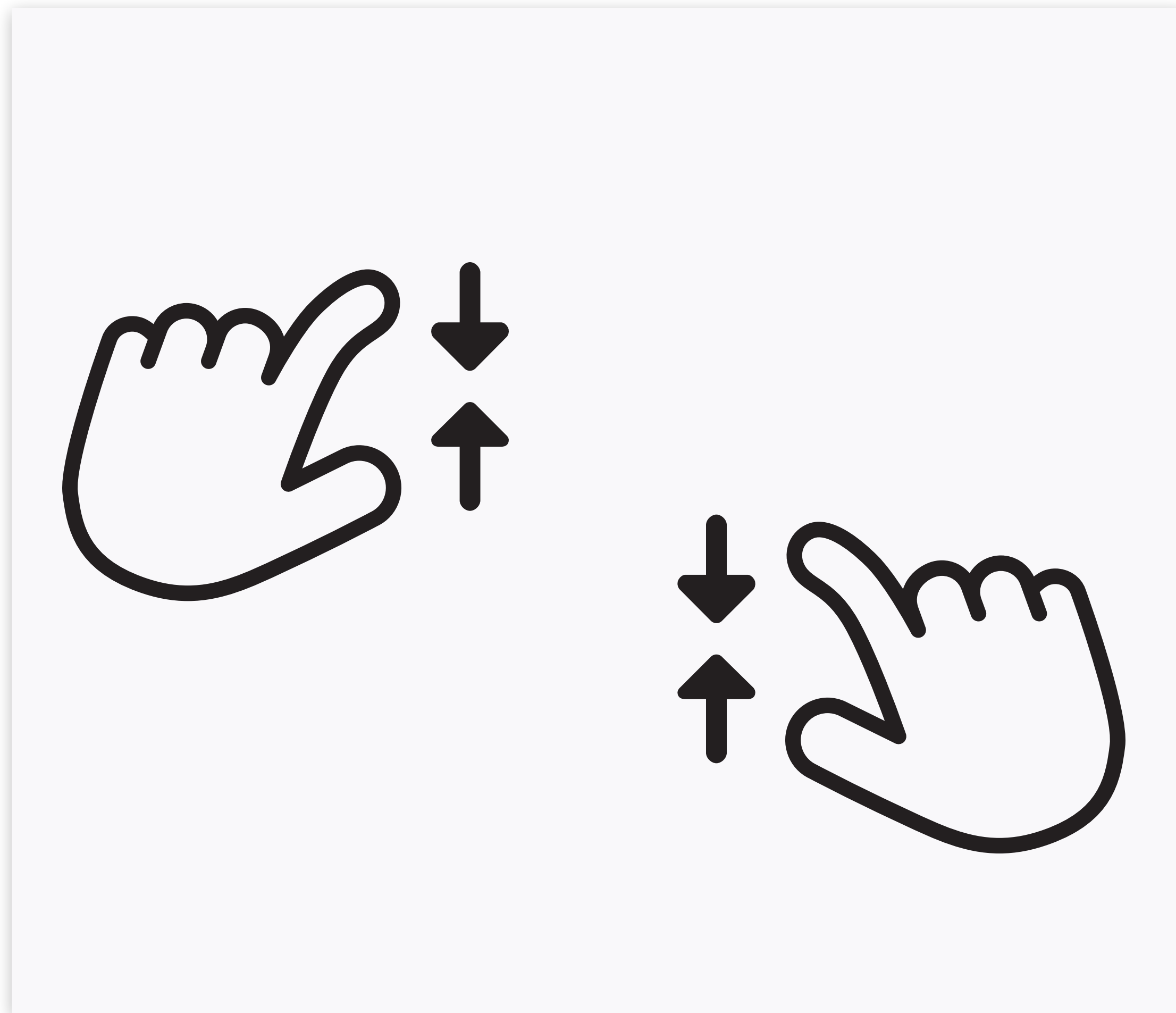
# Gestures

1. Grab Window
2. Resize Window
3. Close/Minimize Window
4. Split screen mode
5. Change Proportions
6. Show all Windows

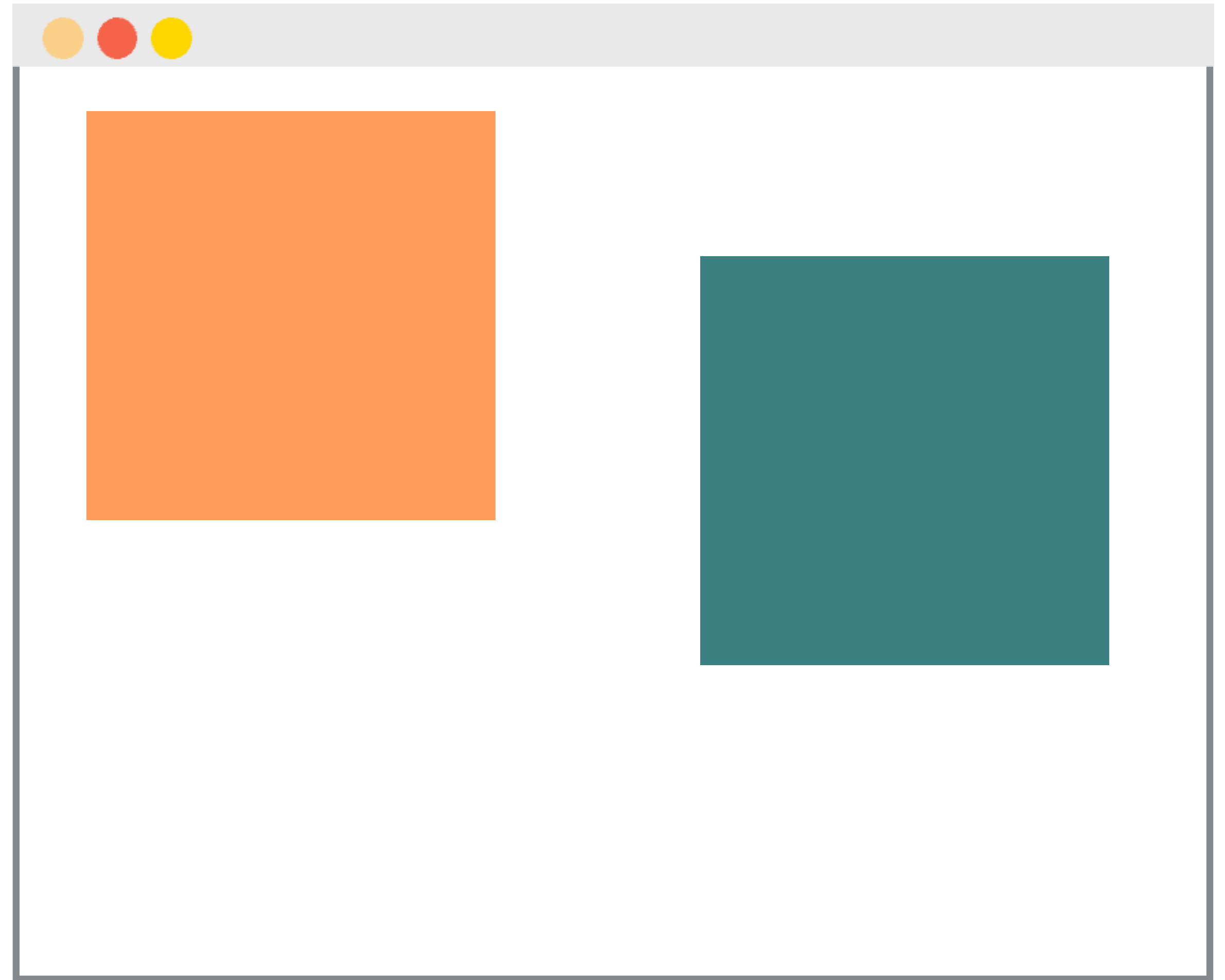
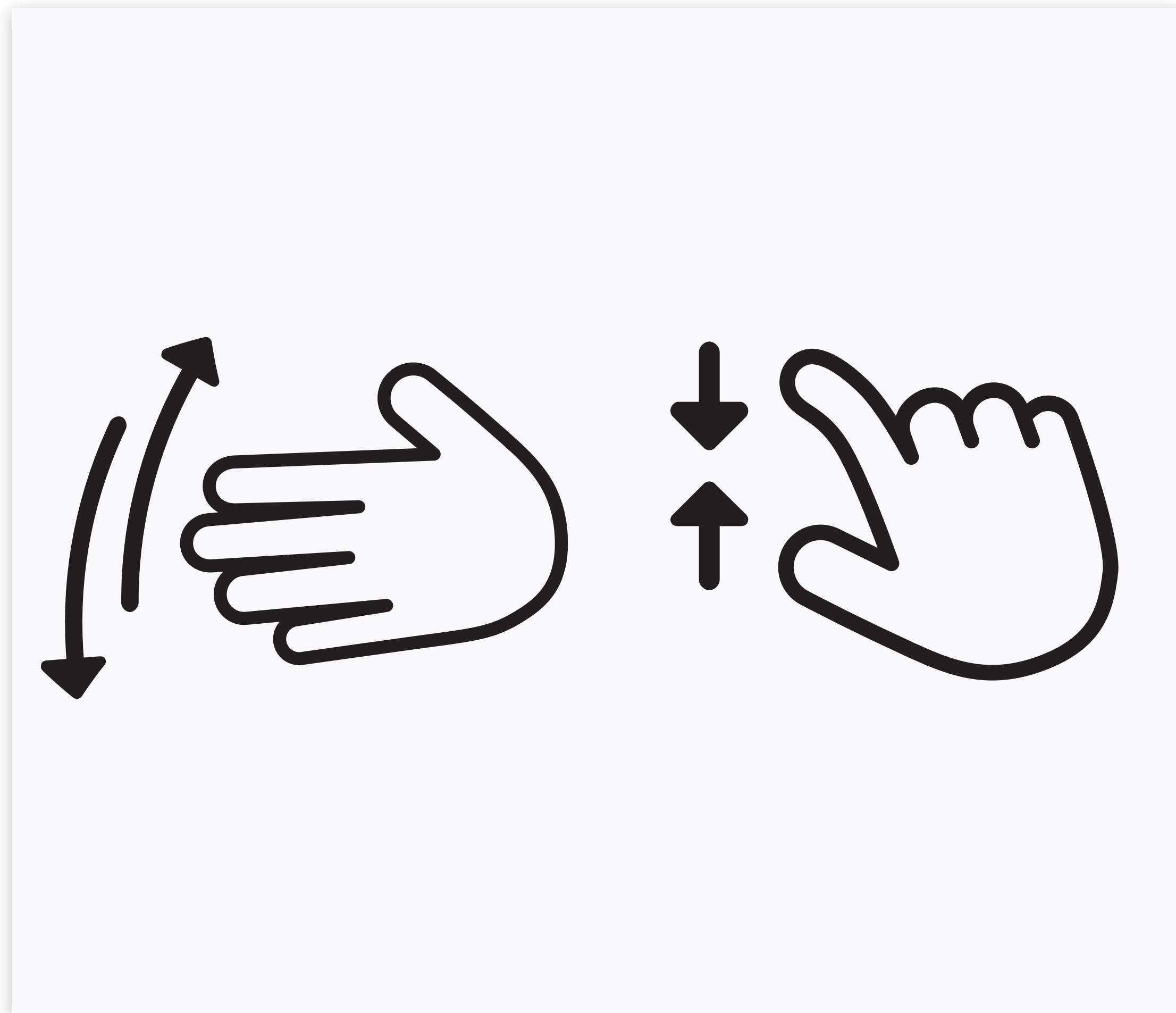
# 1. Grab Window



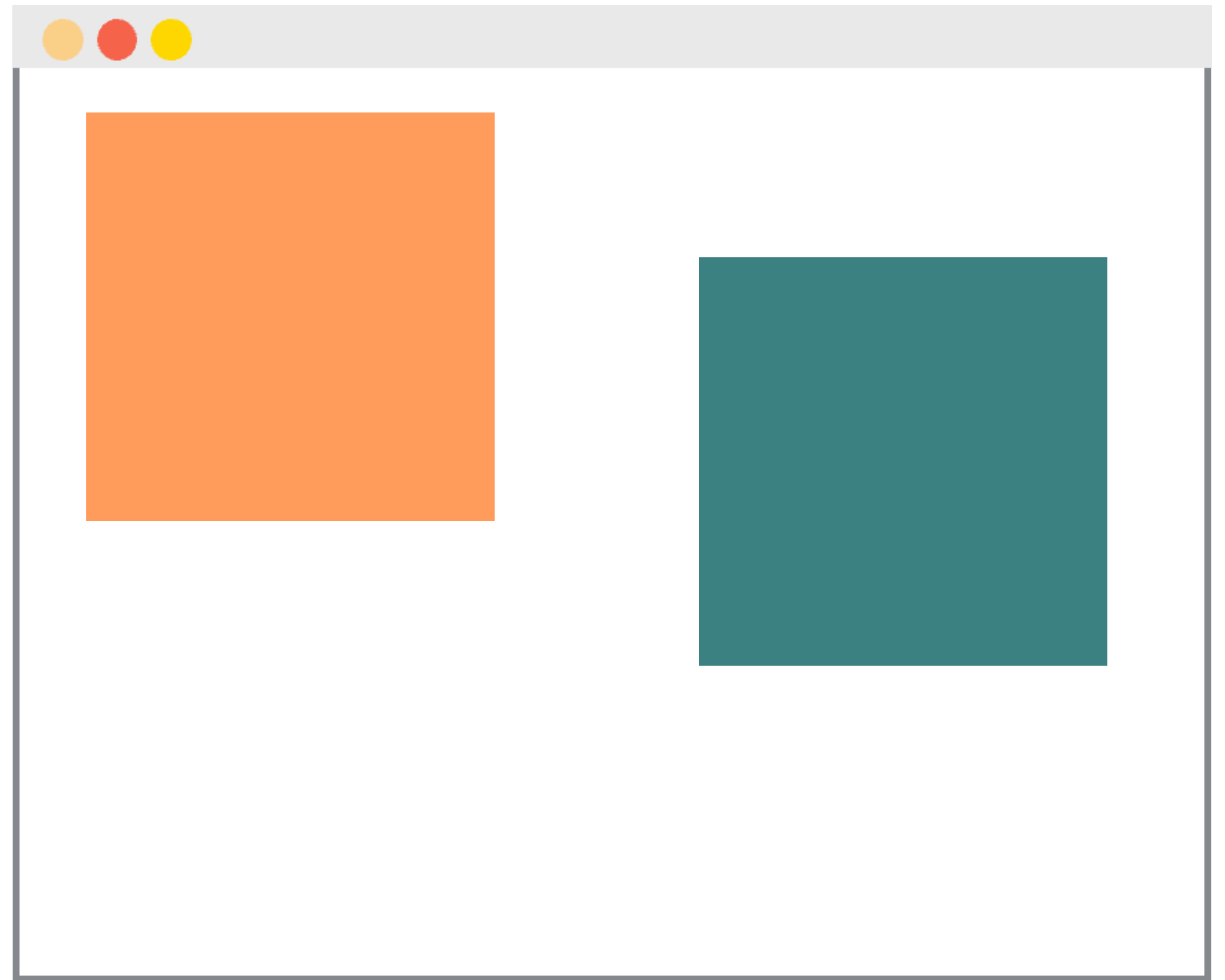
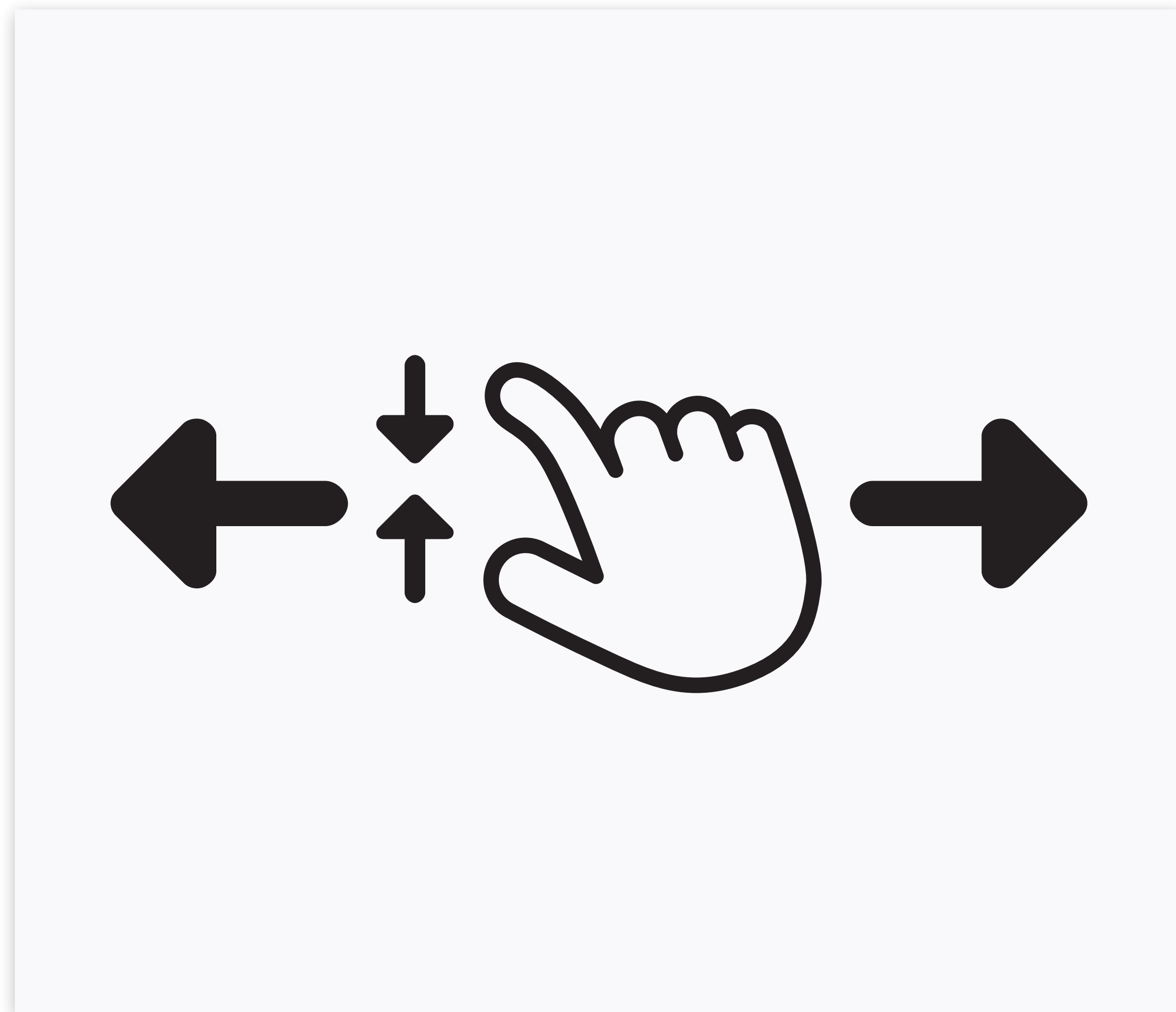
## 2. Resize Window



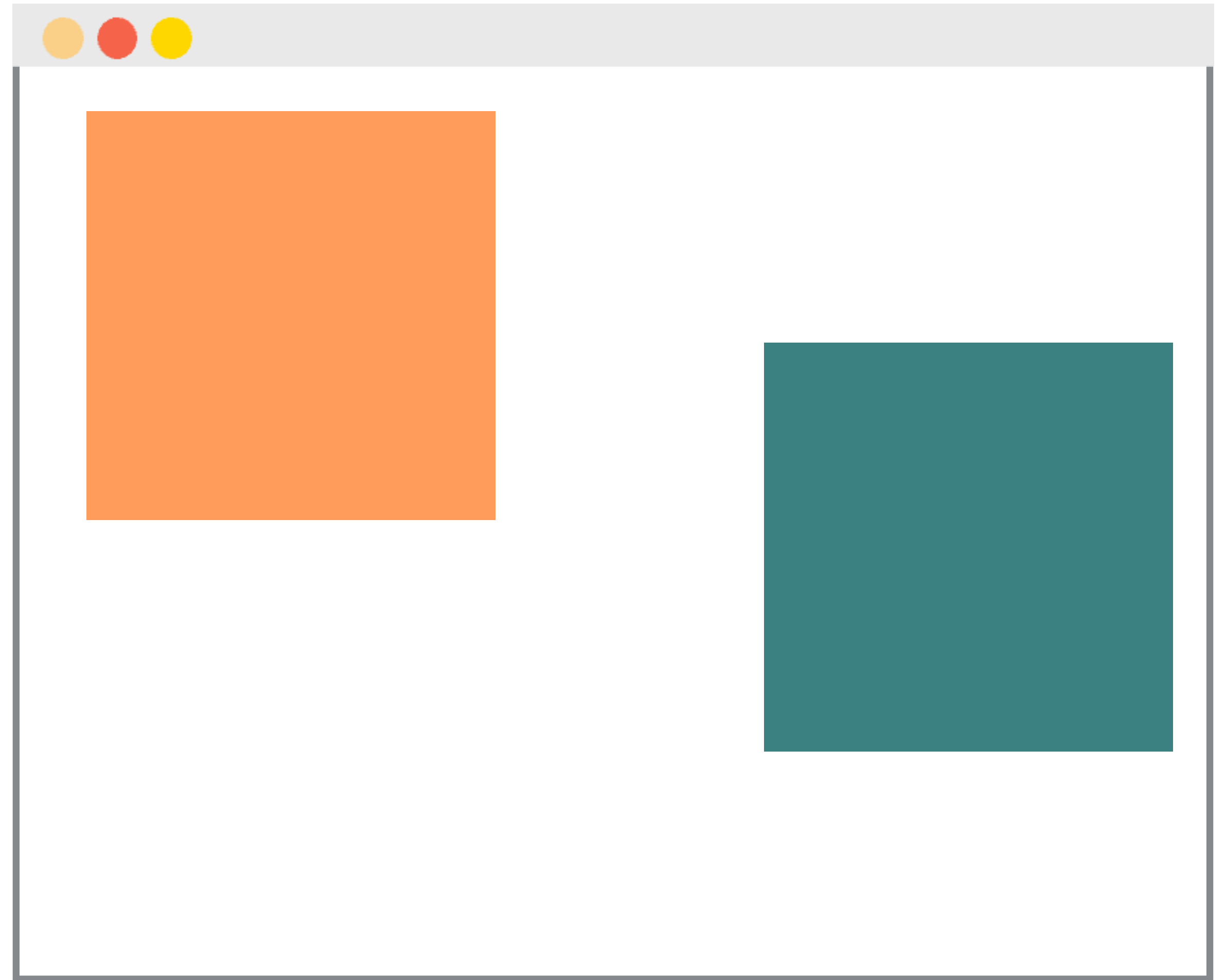
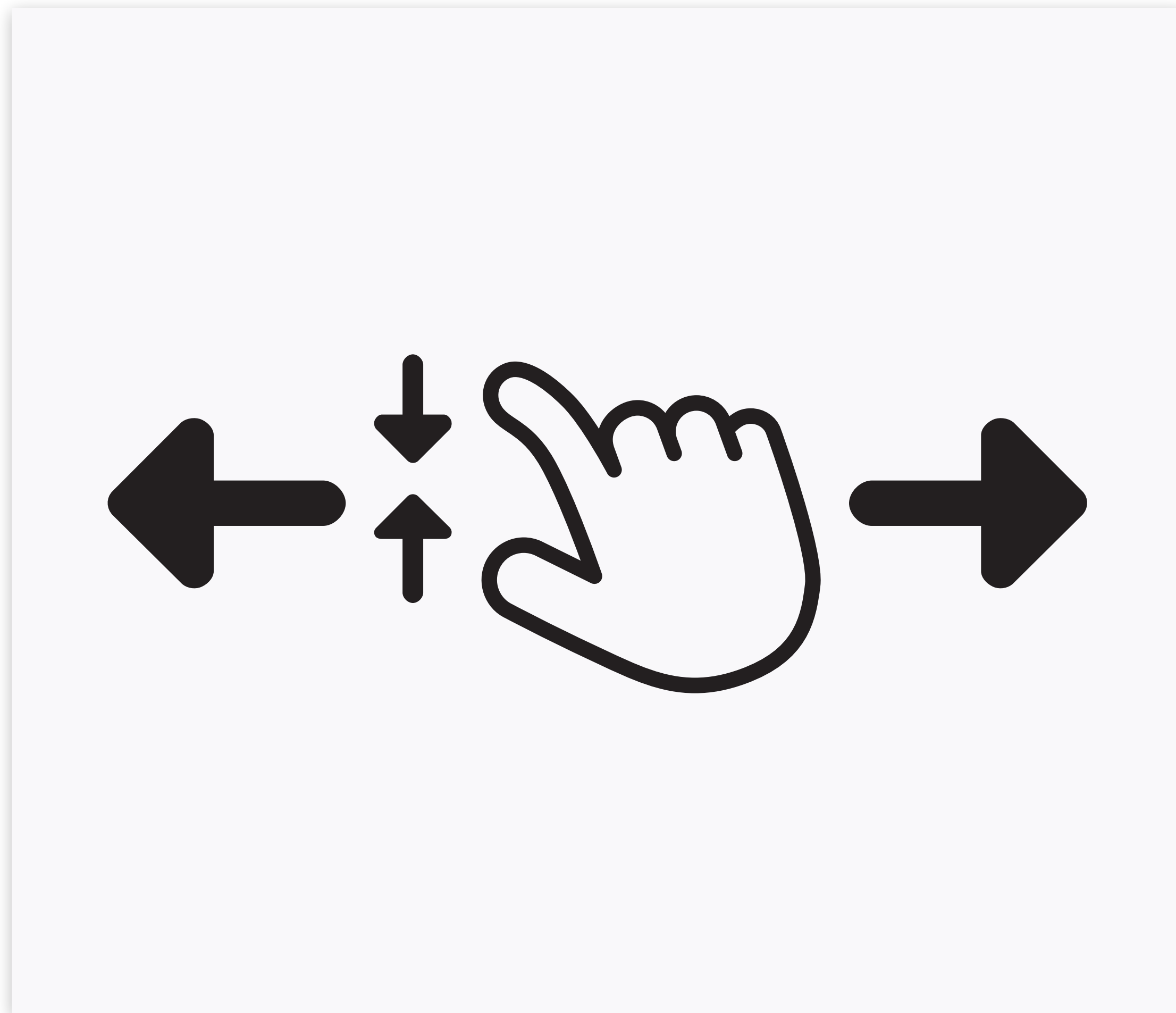
# 3. Close/Minimize Window



# 4. Split screen mode

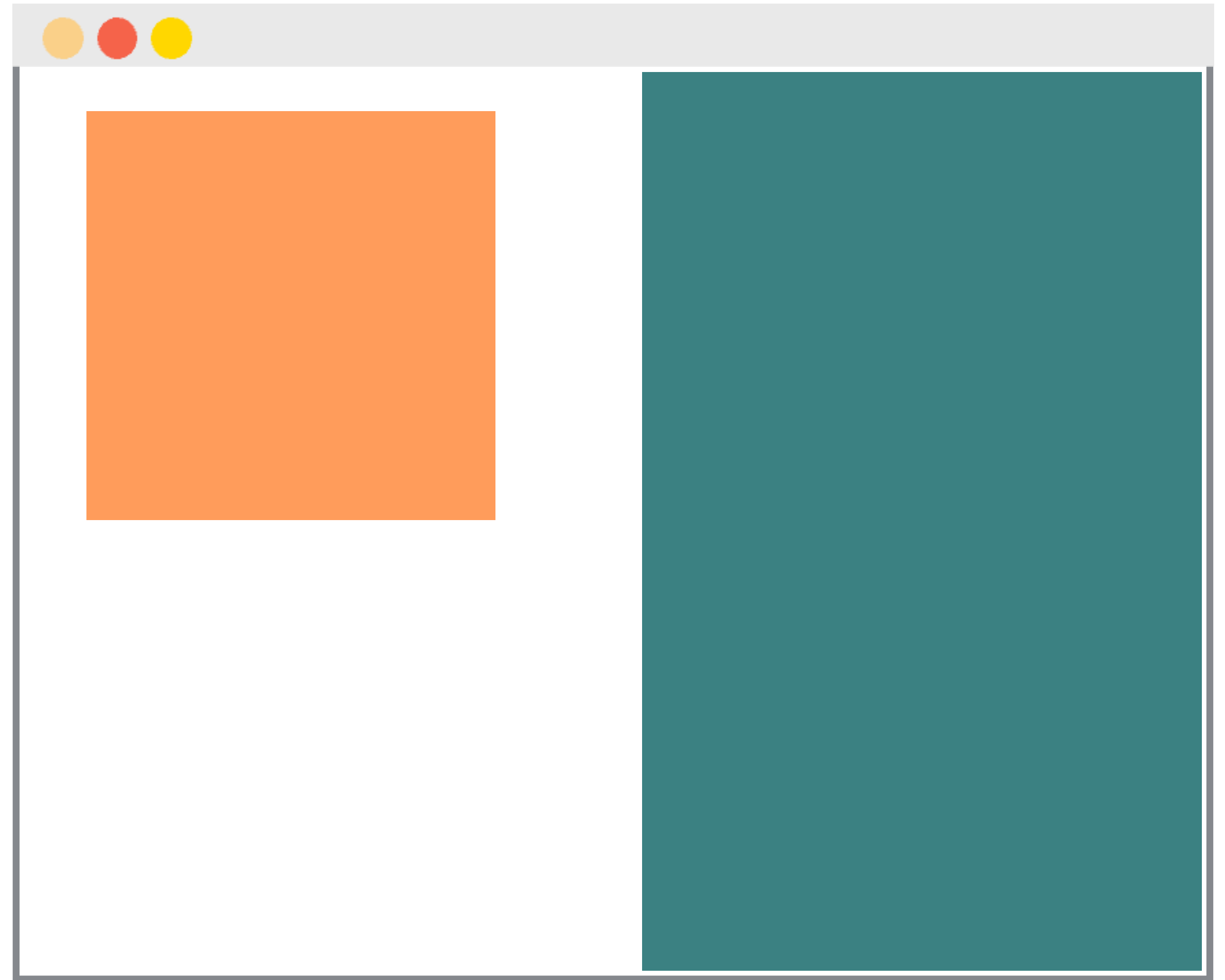
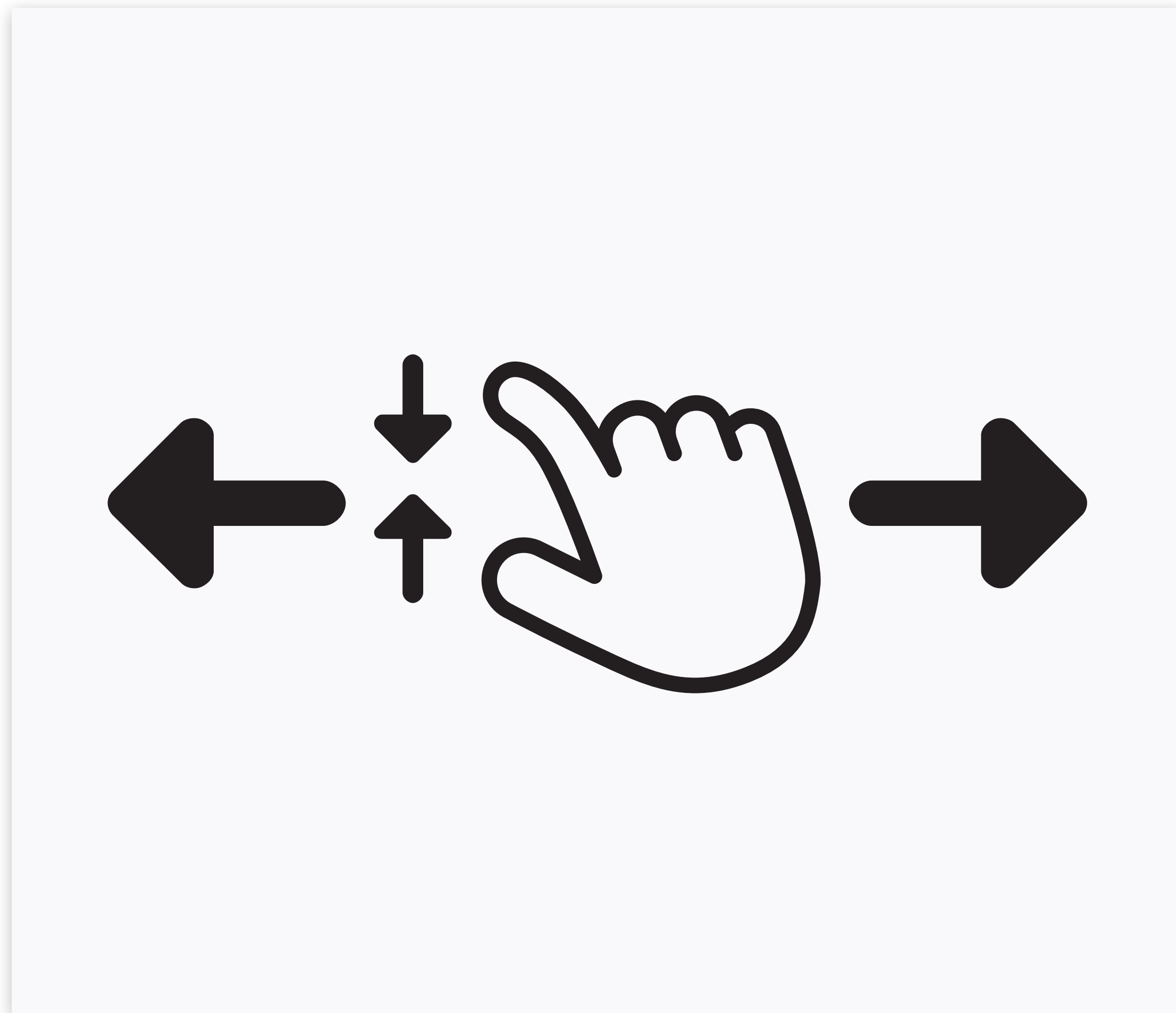


# 4. Split screen mode

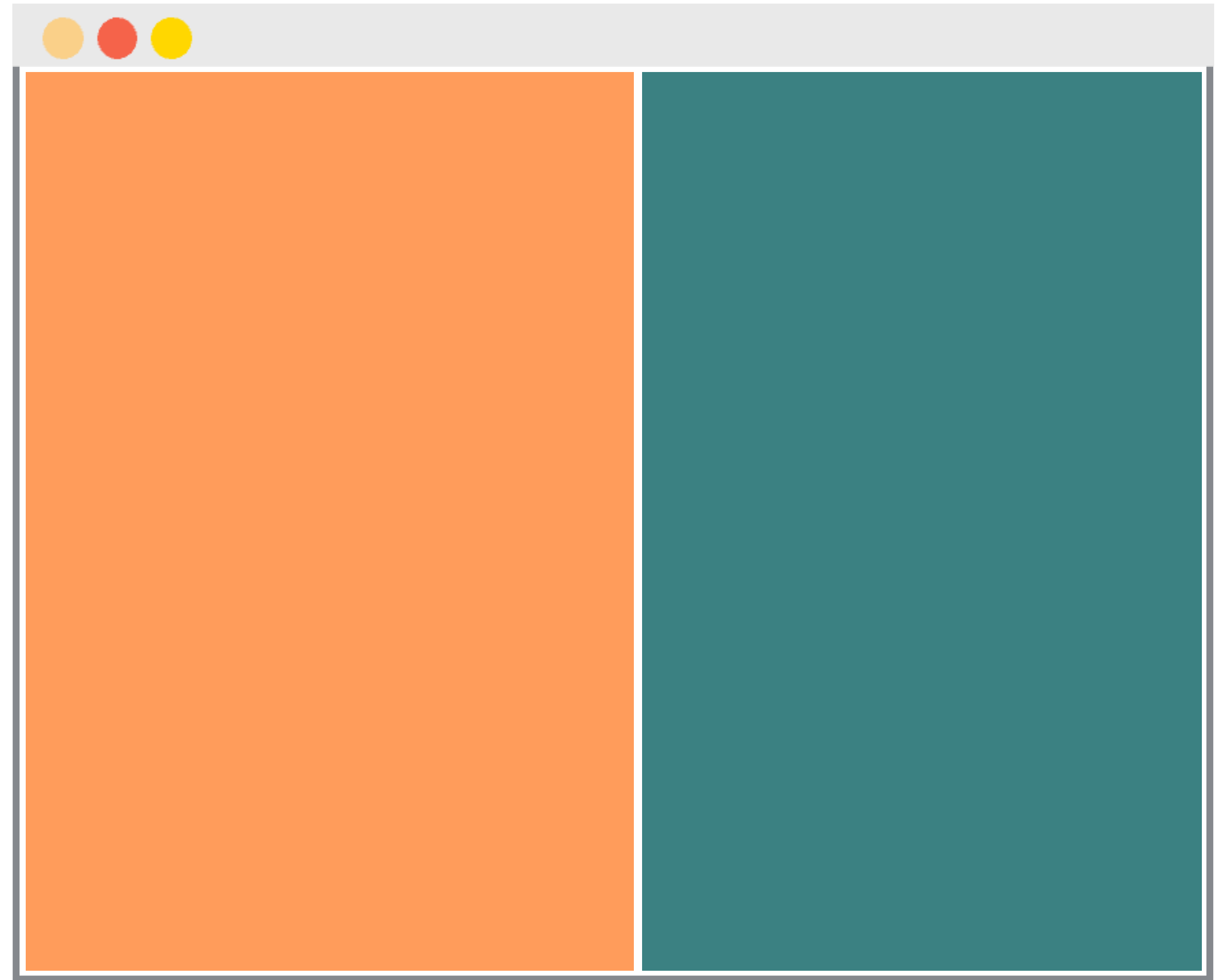
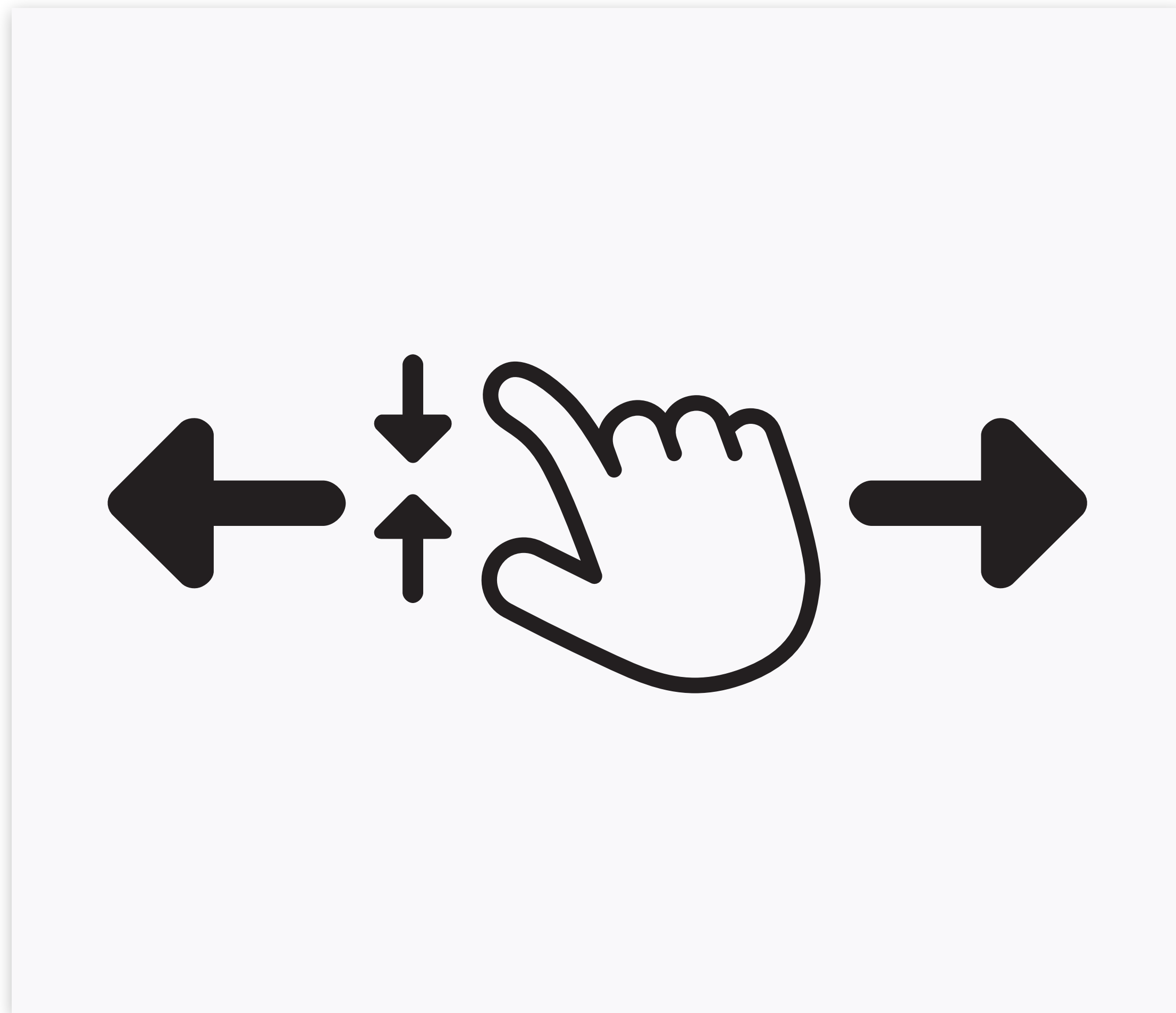




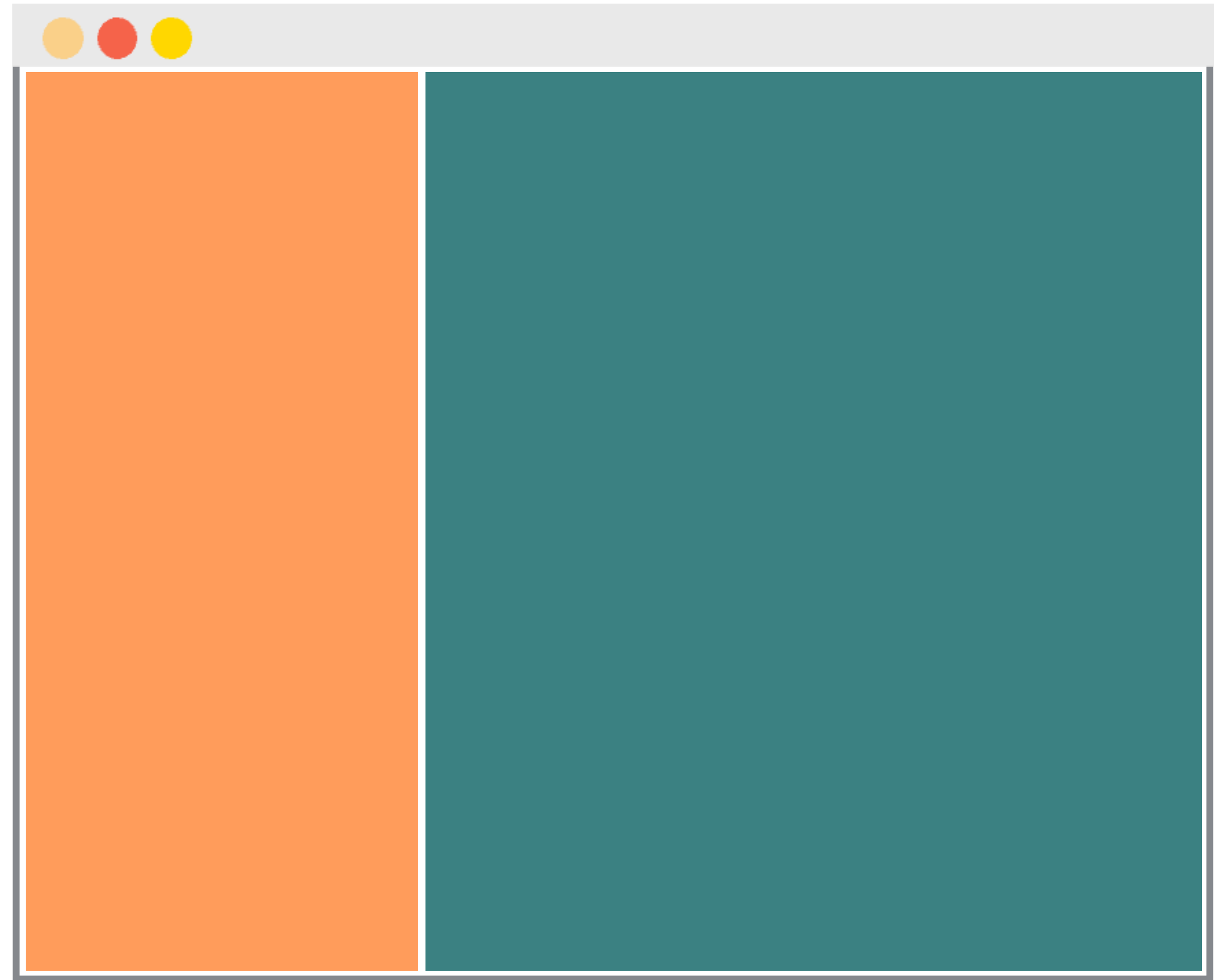
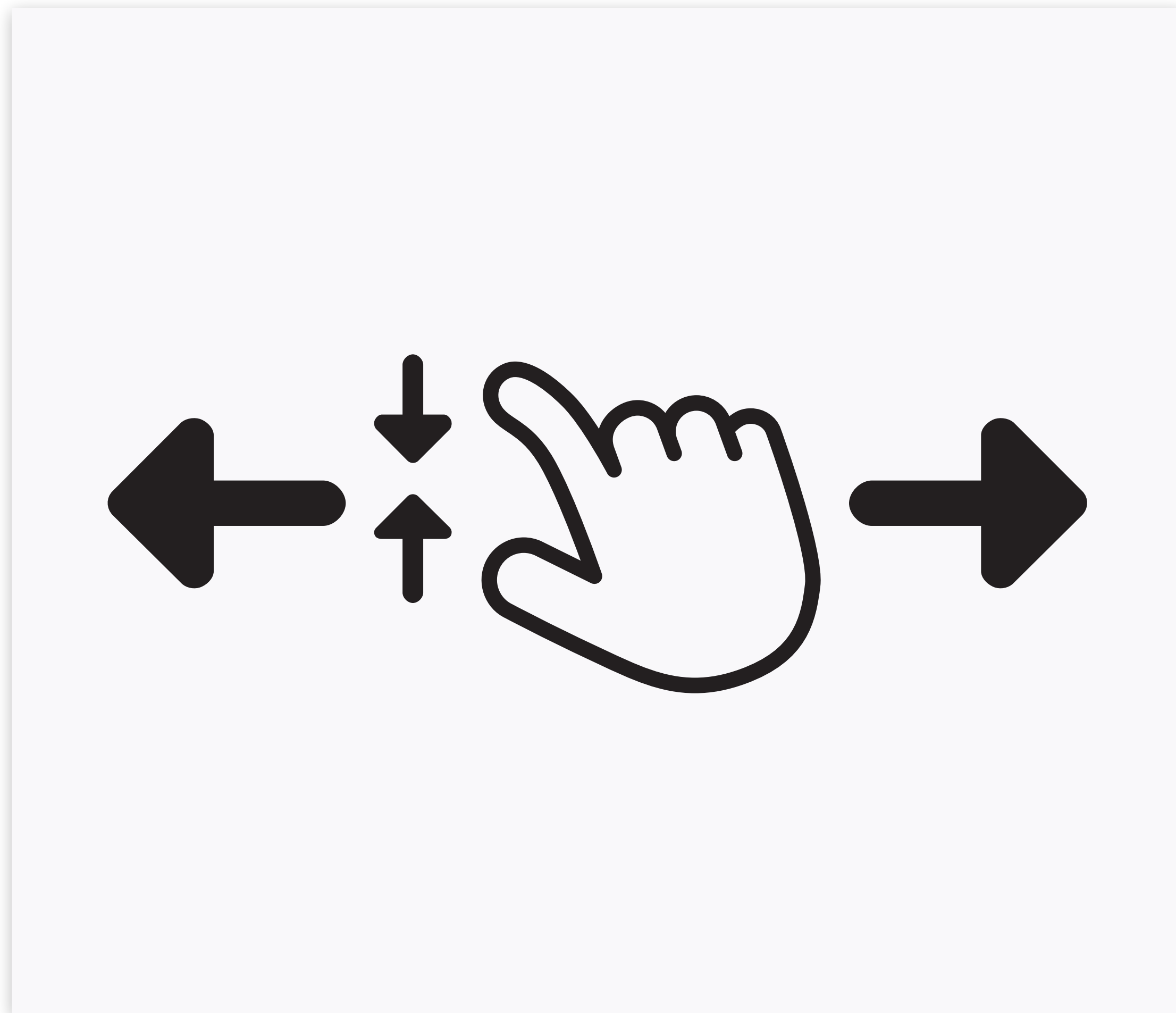
# 4. Split screen mode



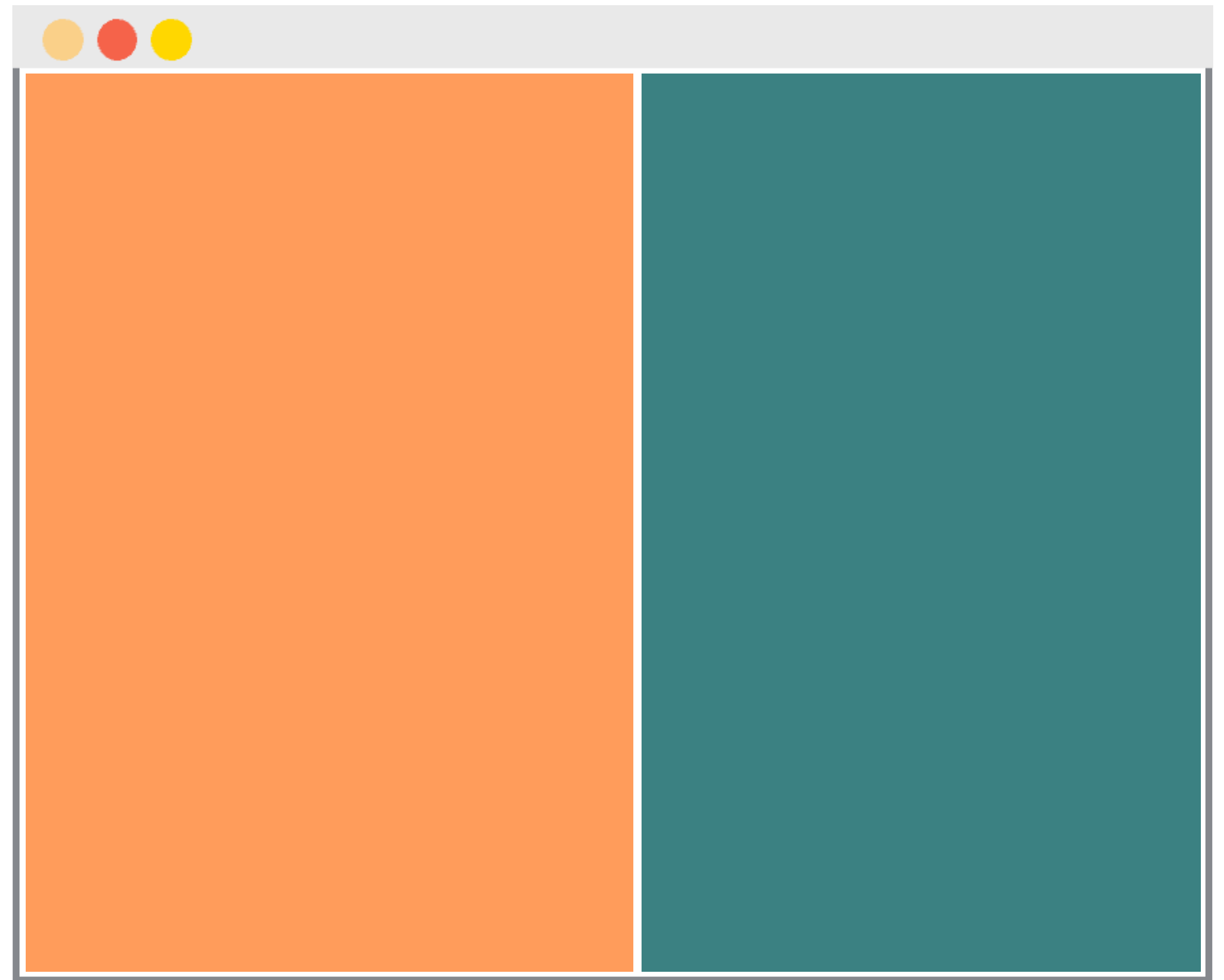
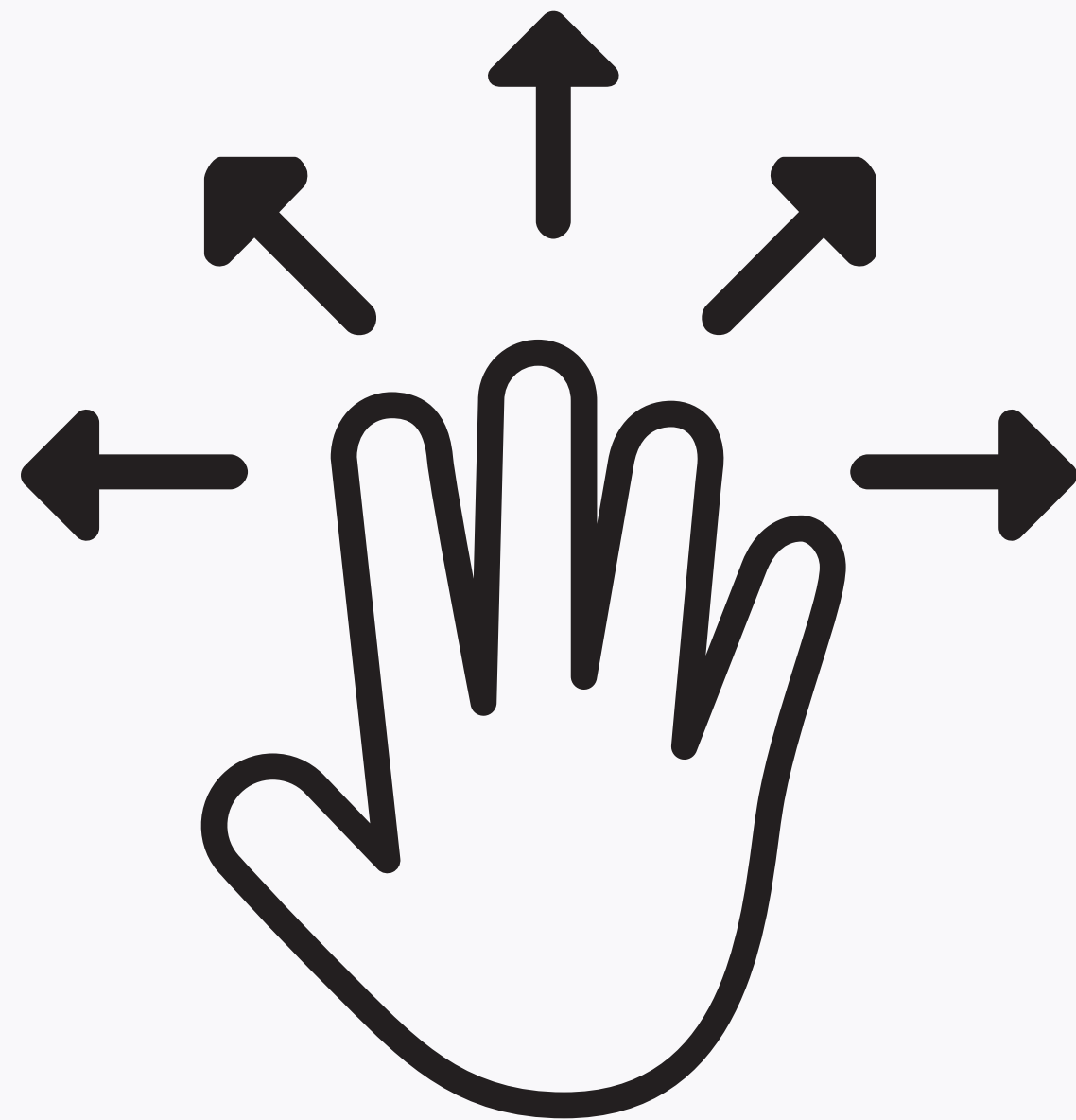
# 5. Change Proportions



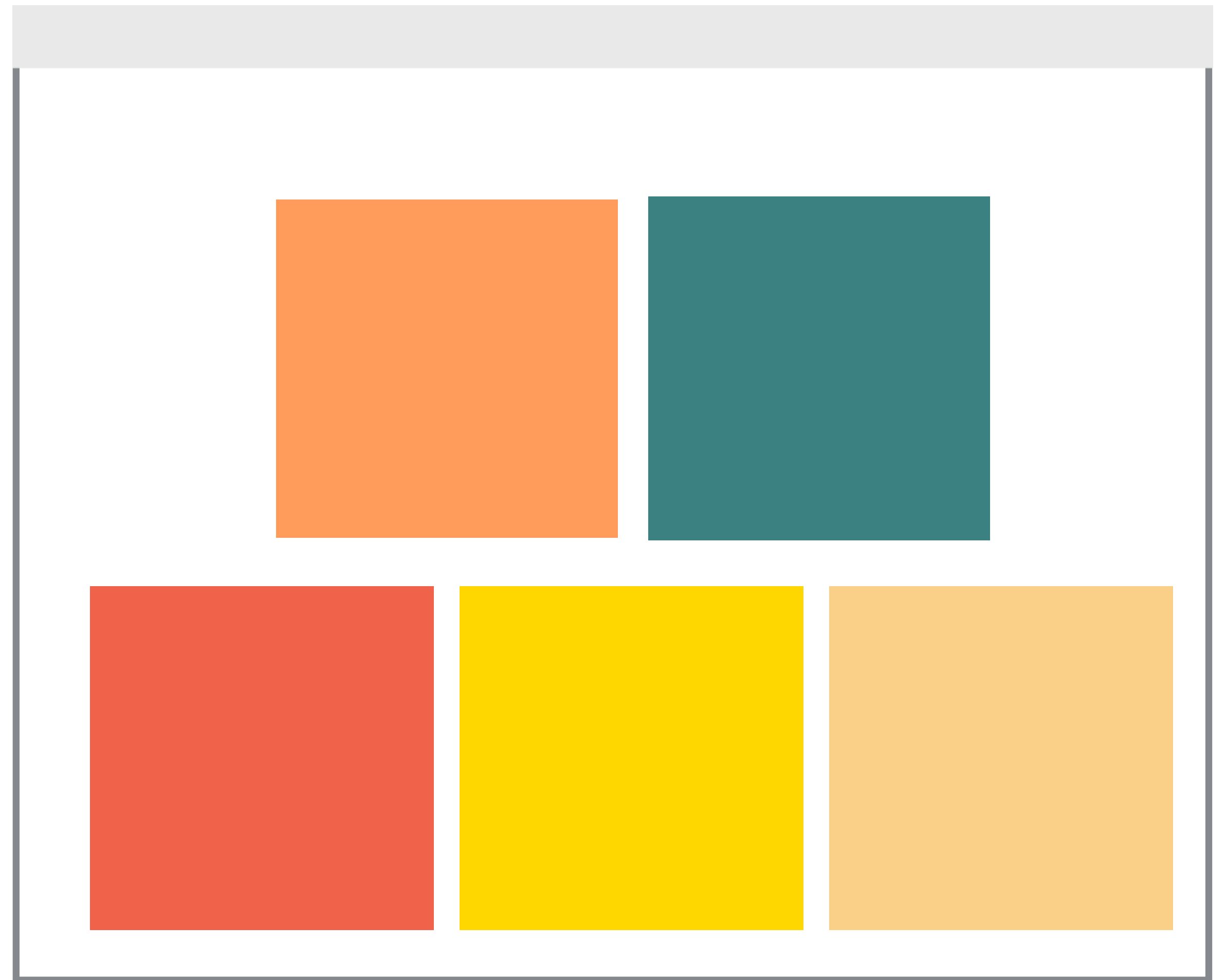
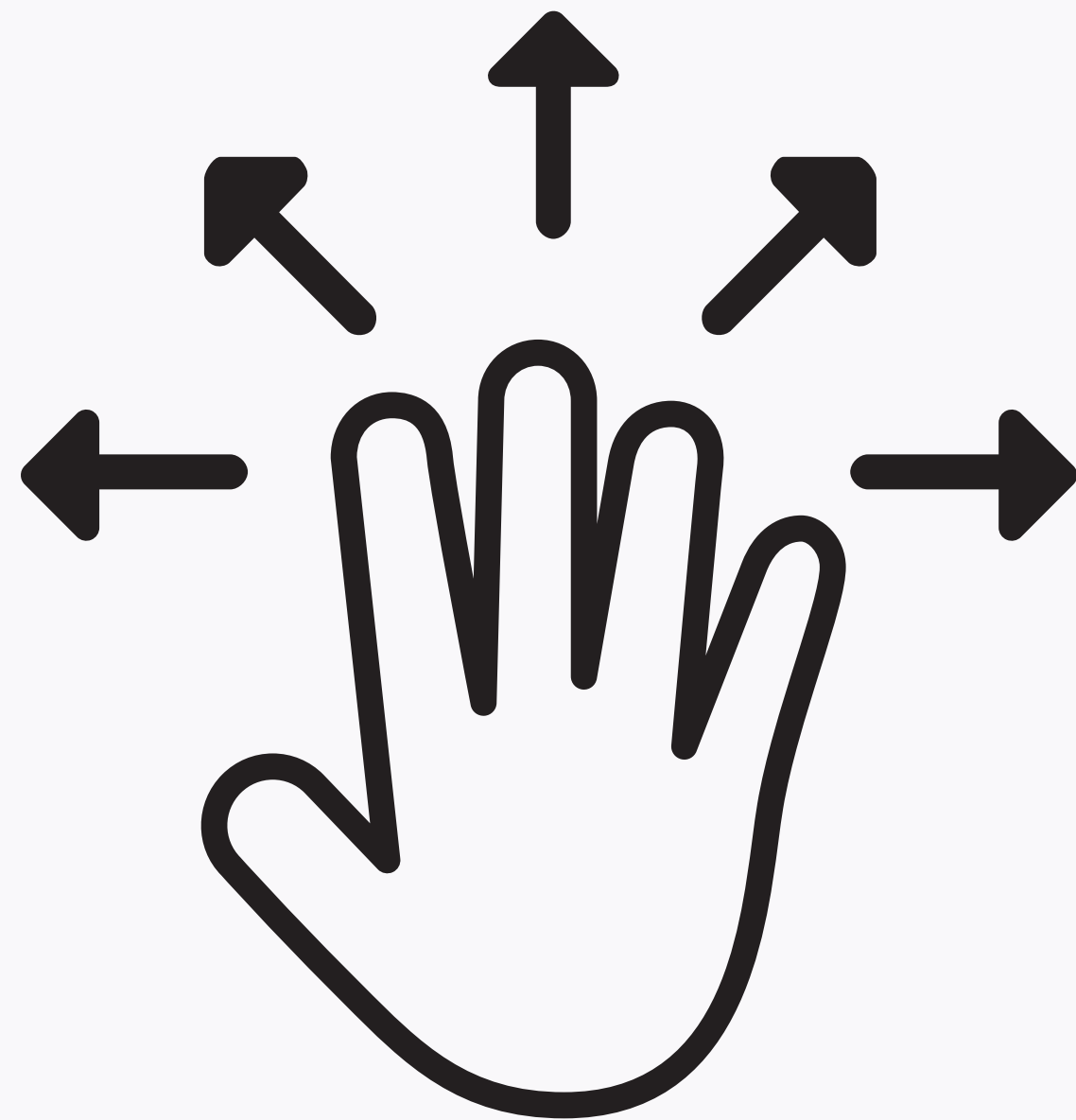
# 5. Change Proportions



# 6. Show all Windows



# 6. Show all Windows



# **Technical Demo**