WhiteHat Jr
Live online Coding for Kids

Topic	MULTIPLE FILTERS TRYOUT	
Class Description	**Students will learn to add multiple filter options to try out different frames in the app based on data collected after face detection.**	
Class	**C183**	
Class time	**45 mins**	
Goal	● Learn to create and add multiple face filters on the face.	
Resources Required	● Teacher Resources: ○ Visual Studio Code Editor ○ laptop with internet connectivity ○ smartphone ○ earphones with mic ○ notebook and pen ● Student Resources: ○ Visual Studio Code Editor ○ laptop with internet connectivity ○ smartphone ○ earphones with mic ○ notebook and pen	
Class structure	**Warm-Up** **Teacher-led Activity** **Student-led Activity** **Wrap-Up**	**5 mins** **15 mins** **20 mins** **5 mins**

WARM-UP SESSION - 5 mins

CONTEXT

- **Design App UI.**
- **Adding multiple face filters.**

Teacher Starts Slideshow **Slide 1 to 4** Refer to speaker notes and follow the instructions on each slide.	
Hey <student's name>. How are you? It's great to see you! Are you excited to learn something new today? **Following are the WARM-UP session deliverables:** ● Greet the student. ● Revision of previous class activities.	**ESR**: Hi, thanks! Yes I am excited about it! Click on the slide show tab and present the slides
WARM-UP QUIZ Click on In-Class Quiz	
Continue WARM-UP Session **Slide 5 to 10**	
Following are the session deliverables: ● Appreciate the student. ● Narrate the story by using hand gestures and voice modulation methods to bring in more interest in students.	

Class Steps	**Teacher Action**	**Student Action**
Step 1: **Warm-Up** **(5 mins)**	Hi, how are you? Great!	**ESR:** I am good!
	Can you tell me what we have learned in the previous class?	**ESR:** ● We learned how to add face filter images using the data received from the Expo

	Yes. Correct! In the previous class we learned to use the **faces** array data (that we received using FaceDetector) to place the filter images over some facial features. In today's class we are going to learn to add multiple filter options at the bottom of the app screen, from which users can select to try out different frame filters. Are you excited? Let's get started then.	FaceDetector module. **ESR**: Yes.

Teacher Ends Slideshow

TEACHER-LED ACTIVITY - 15 mins

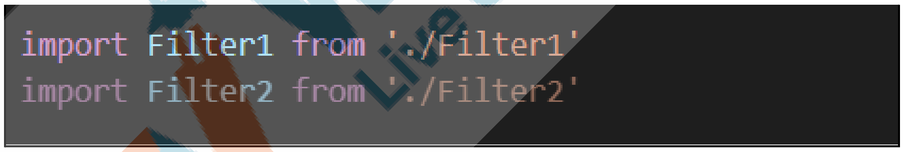
Teacher Initiates Screen Share

CHALLENGE

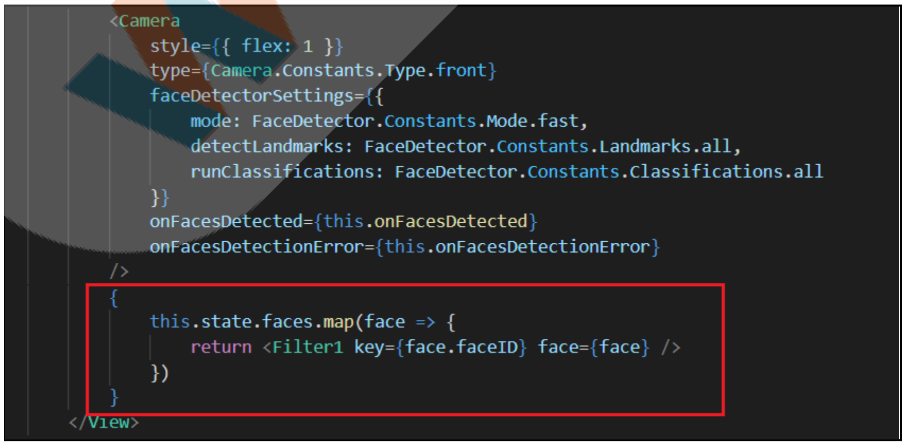
- **Design App UI.**
- **Adding multiple face filters.**

Step 2: Teacher-led Activity (15 mins)	*<The teacher clones the code Teacher Activity 1.* ***Note**: Do install node modules.>* ***[Teacher Activity 1]*** In the previous class, we've created two different filters, but we could only use one at a time to try out, right? *The teacher explains the previous class code from Teacher Activity 1.* In the **Main.js** file, we have the file **Filter1.js** and **Filter2.js** under the screens folder (from the previous class) and we have rendered only one filter image under **cameraStyle** <View> container.	**ESR**: Yes.

Previous class code section (./screens/Main.js)



```
import Filter1 from './Filter1'
import Filter2 from './Filter2'
```

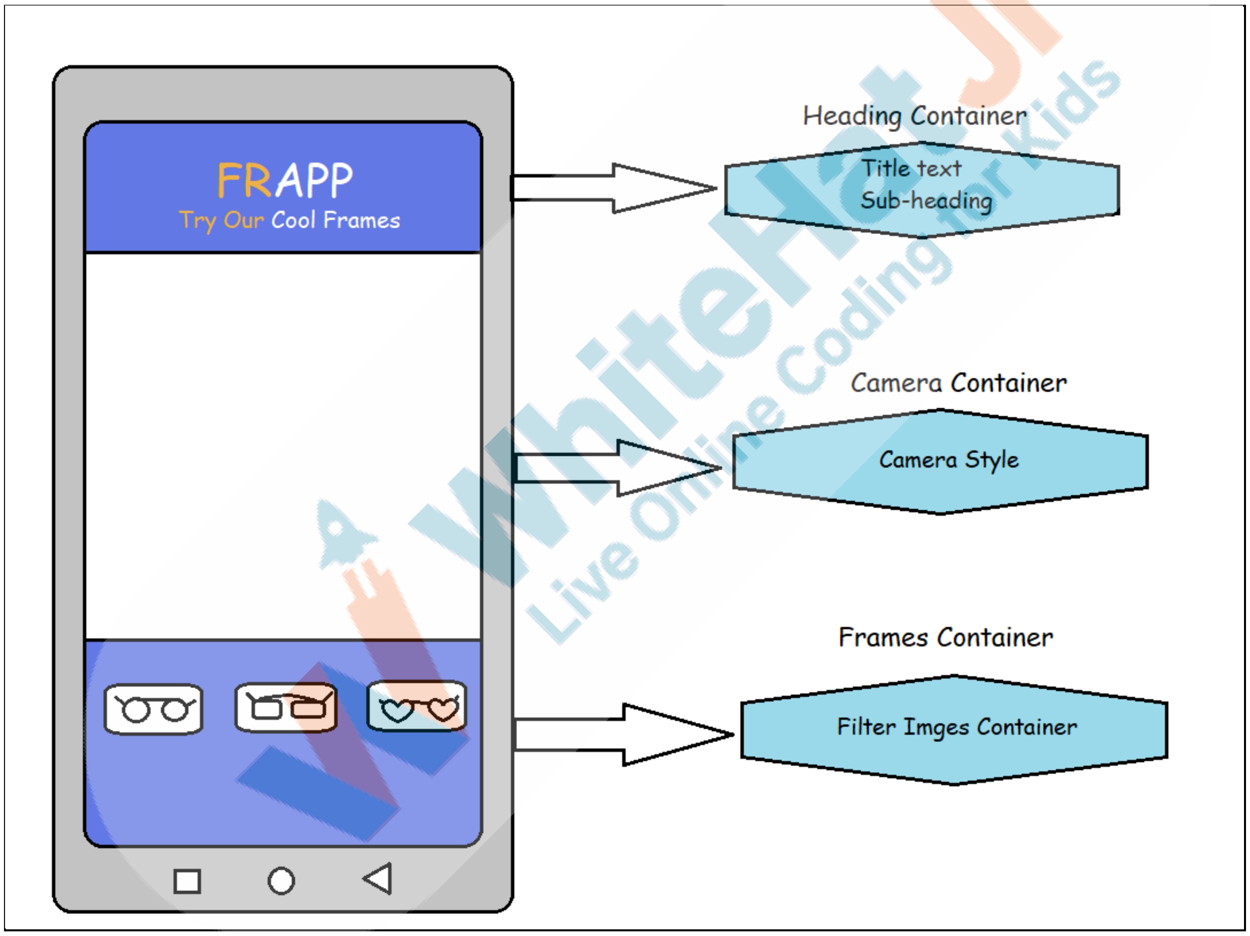


```
        <Camera
            style={{ flex: 1 }}
            type={Camera.Constants.Type.front}
            faceDetectorSettings={{
                mode: FaceDetector.Constants.Mode.fast,
                detectLandmarks: FaceDetector.Constants.Landmarks.all,
                runClassifications: FaceDetector.Constants.Classifications.all
            }}
            onFacesDetected={this.onFacesDetected}
            onFacesDetectionError={this.onFacesDetectionError}
        />
        {
            this.state.faces.map(face => {
                return <Filter1 key={face.faceID} face={face} />
            })
        }
    </View>
```

	Now we would want our app users to choose from multiple glasses (spectacles) filters and try them out over the eyes. For this, let's begin designing the app from the top. *<Open the image from Teacher Activity 2 and discuss the design of the app.>* First we would want to set the **name of the app** and some other text that we want to show as a **subheading** in the app. The name and subheading will be in two different colors. Then we would need a **camera** section. After this we are going to add an image container for each frame at the bottom and the user can tap on the image to try out the frame. Users can also scroll horizontally from right to left for more frame filters. To summarize will we need: **Heading Container**: To render the name of the app and some other information heading.	

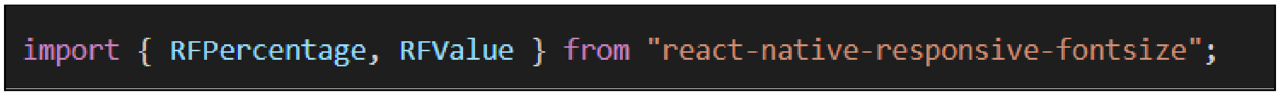
	Camera Container: To style the camera section. **Frames Container**: To add frames images using an image container for each frame image.	

***Note**: This image is only for referential purposes for the teacher. This shows only the design layout prototype of the app. The actual styling of the app might differ.*



	Let’s begin with the heading now. To add the headings, we are going to use the <Text> component. The most important thing for any app is how responsive the app is to different devices!. This means no matter which device we will use to run the app, the UI components (like images, texts, etc.) of the app must not get distorted. To make these texts responsive and adjust according to the screen size, we will install one of the React Native libraries. **npm install react-native-responsive-fontsize --save** And now we can import **RFPercentage** and **RFValue** from this in our app, which we will use to style the <Text> component. **RFPercentage**: Sets the font size with respect to the height of the device (in percentage). **RFValue**: Sets the font size based on standardScreenHeight.	

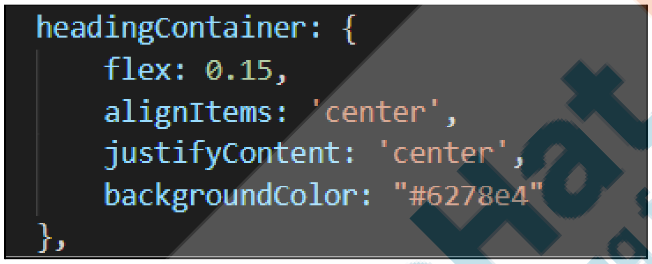
./screens/Main.js



```
import { RFPercentage, RFValue } from "react-native-responsive-fontsize";
```

Now we can add the style containers for the heading with a name **headingContainer**.

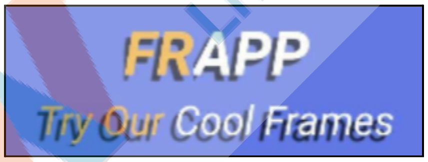
./screens/Main.js



```
headingContainer: {
    flex: 0.15,
    alignItems: 'center',
    justifyContent: 'center',
    backgroundColor: "#6278e4"
},
```

The name of the app and subheading will have two different colors.

***Note**: The Teacher/Student can choose any color, or font style etc on their own to style the text.*

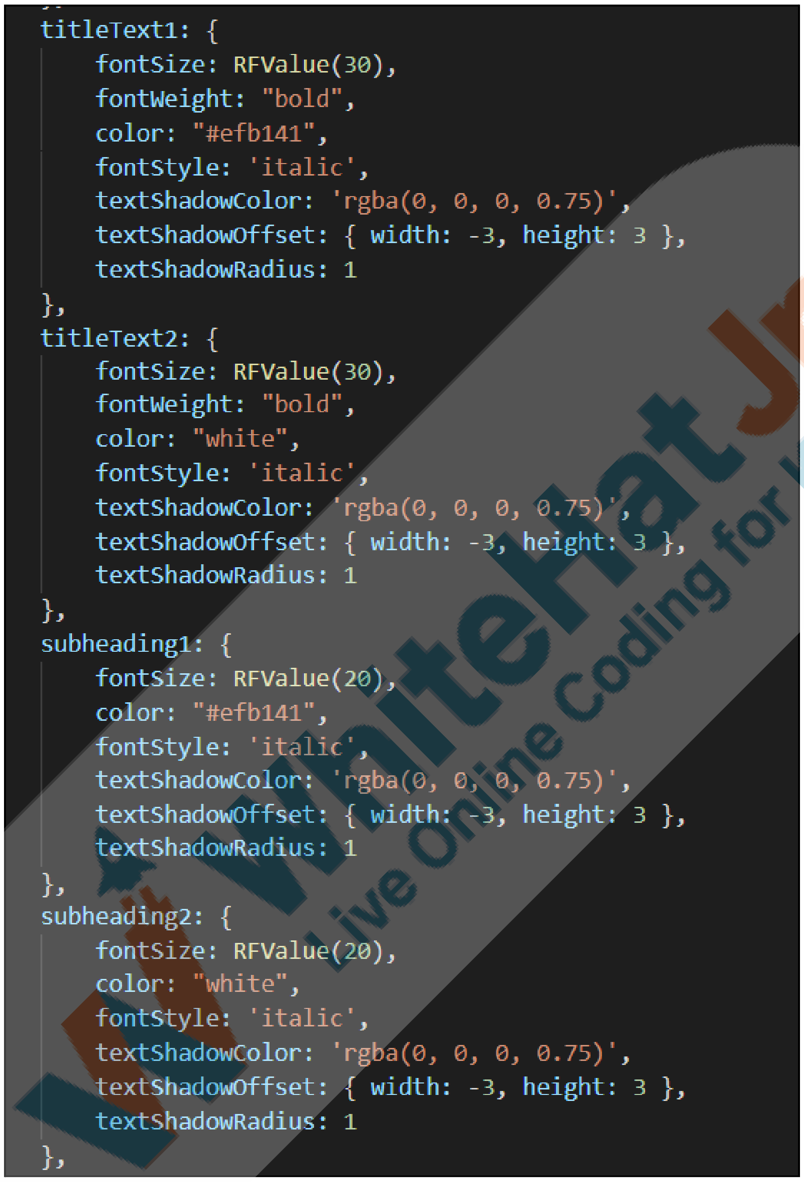


For this we can divide the styling into two different parts, each for one color, as:

- For the name of app:
    - **titleText1**, for the text "**FR**"

	○ **titleText2,** for the text "**APP**" in the name of the app ● For the subheading of the app: ○ **subHeading1,** for the text "**Try Our**" ○ **subHeading2** for the text "**Cool Frames**" in the subheading of the app	

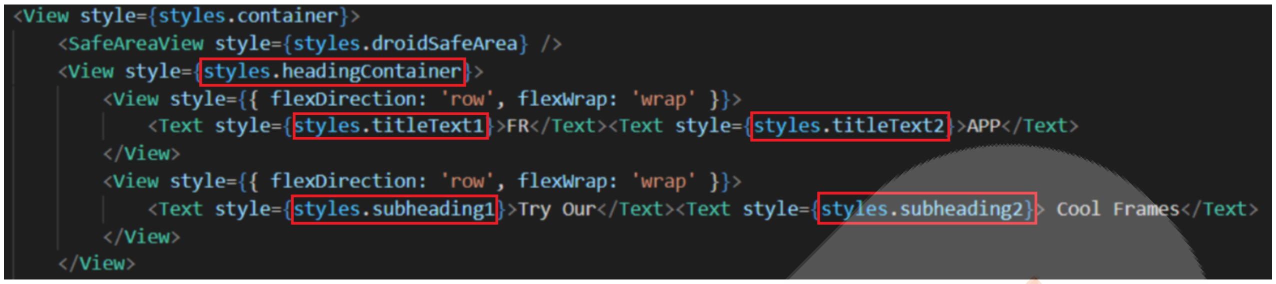
./screens/Main.js



```
titleText1: {
    fontSize: RFValue(30),
    fontWeight: "bold",
    color: "#efb141",
    fontStyle: 'italic',
    textShadowColor: 'rgba(0, 0, 0, 0.75)',
    textShadowOffset: { width: -3, height: 3 },
    textShadowRadius: 1
},
titleText2: {
    fontSize: RFValue(30),
    fontWeight: "bold",
    color: "white",
    fontStyle: 'italic',
    textShadowColor: 'rgba(0, 0, 0, 0.75)',
    textShadowOffset: { width: -3, height: 3 },
    textShadowRadius: 1
},
subheading1: {
    fontSize: RFValue(20),
    color: "#efb141",
    fontStyle: 'italic',
    textShadowColor: 'rgba(0, 0, 0, 0.75)',
    textShadowOffset: { width: -3, height: 3 },
    textShadowRadius: 1
},
subheading2: {
    fontSize: RFValue(20),
    color: "white",
    fontStyle: 'italic',
    textShadowColor: 'rgba(0, 0, 0, 0.75)',
    textShadowOffset: { width: -3, height: 3 },
    textShadowRadius: 1
},
```

Now we can add the reference to these styling containers, **headingContainer** **titleText1**, **titleText2**, **subHeading1** and **subHeading2** in the **<View>** and **<Text>** component inside the **return()** method of the **Main** component.

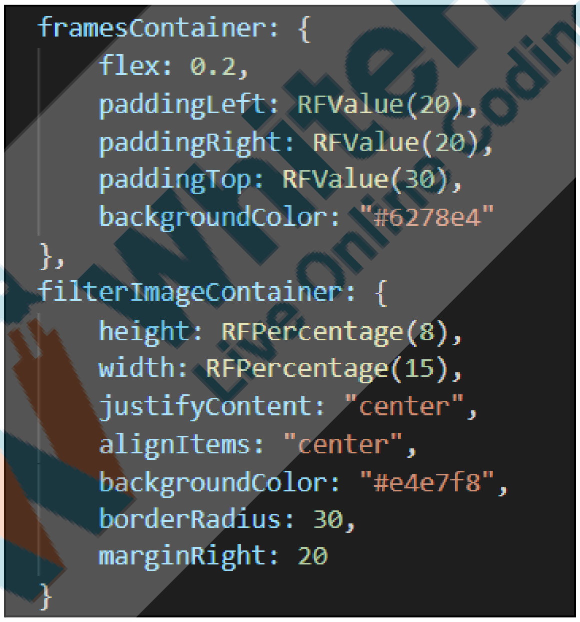
./screens/Main.js



```
<View style={styles.container}>
    <SafeAreaView style={styles.droidSafeArea} />
    <View style={styles.headingContainer}>
        <View style={{ flexDirection: 'row', flexWrap: 'wrap' }}>
            <Text style={styles.titleText1}>FR</Text><Text style={styles.titleText2}>APP</Text>
        </View>
        <View style={{ flexDirection: 'row', flexWrap: 'wrap' }}>
            <Text style={styles.subheading1}>Try Our</Text><Text style={styles.subheading2}> Cool Frames</Text>
        </View>
    </View>
```

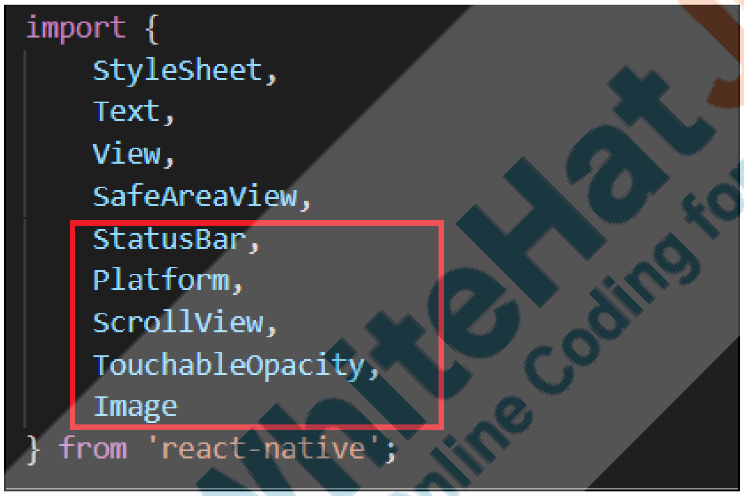
	Now let's add the image container, called **filterImageContainer**, for styling of the two filters that we created in the previous class.	

./screens/Main.js

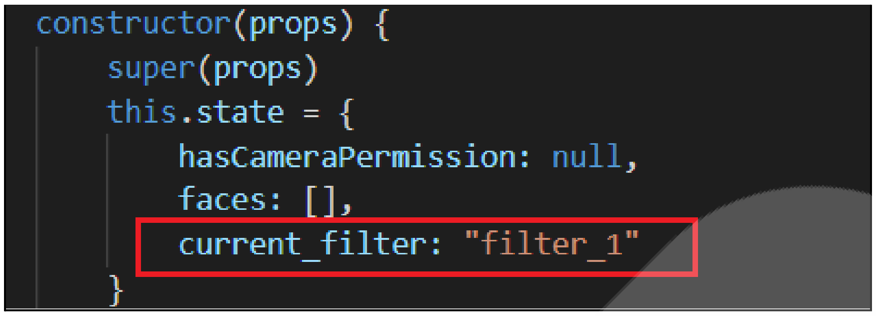


```
framesContainer: {
    flex: 0.2,
    paddingLeft: RFValue(20),
    paddingRight: RFValue(20),
    paddingTop: RFValue(30),
    backgroundColor: "#6278e4"
},
filterImageContainer: {
    height: RFPercentage(8),
    width: RFPercentage(15),
    justifyContent: "center",
    alignItems: "center",
    backgroundColor: "#e4e7f8",
    borderRadius: 30,
    marginRight: 20
}
```

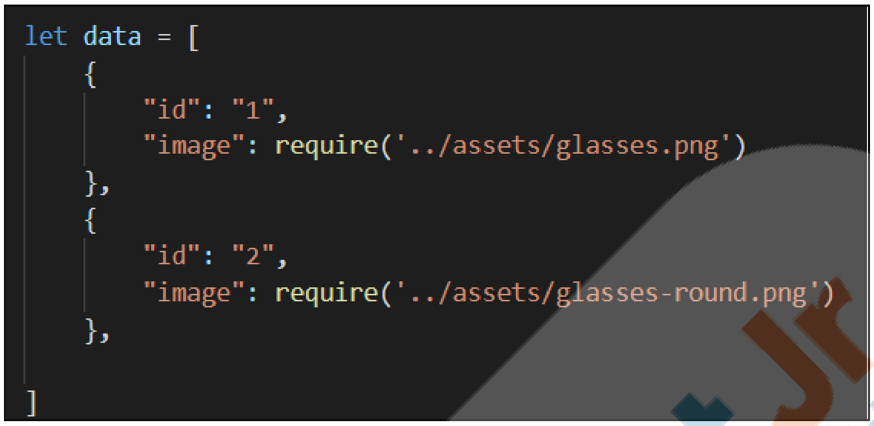
	Since we want to add many filters, we should be able to scroll through all the filters to choose. Then we can tap on the filter image to try that filter out.	

	Can you tell me which react components can be used for this? Superb! Let's import these components.	**ESR**: We can <ScrollView> and <TouchableOpacity>.
./screens/Main.js		
		
	Now let's take a **state variable**, **current_filter**, to keep a track of which filter is being rendered on the face. By default we will use the first filter. So let's keep the value of the variable as "**filter_1**".	
./screens/Main.js		

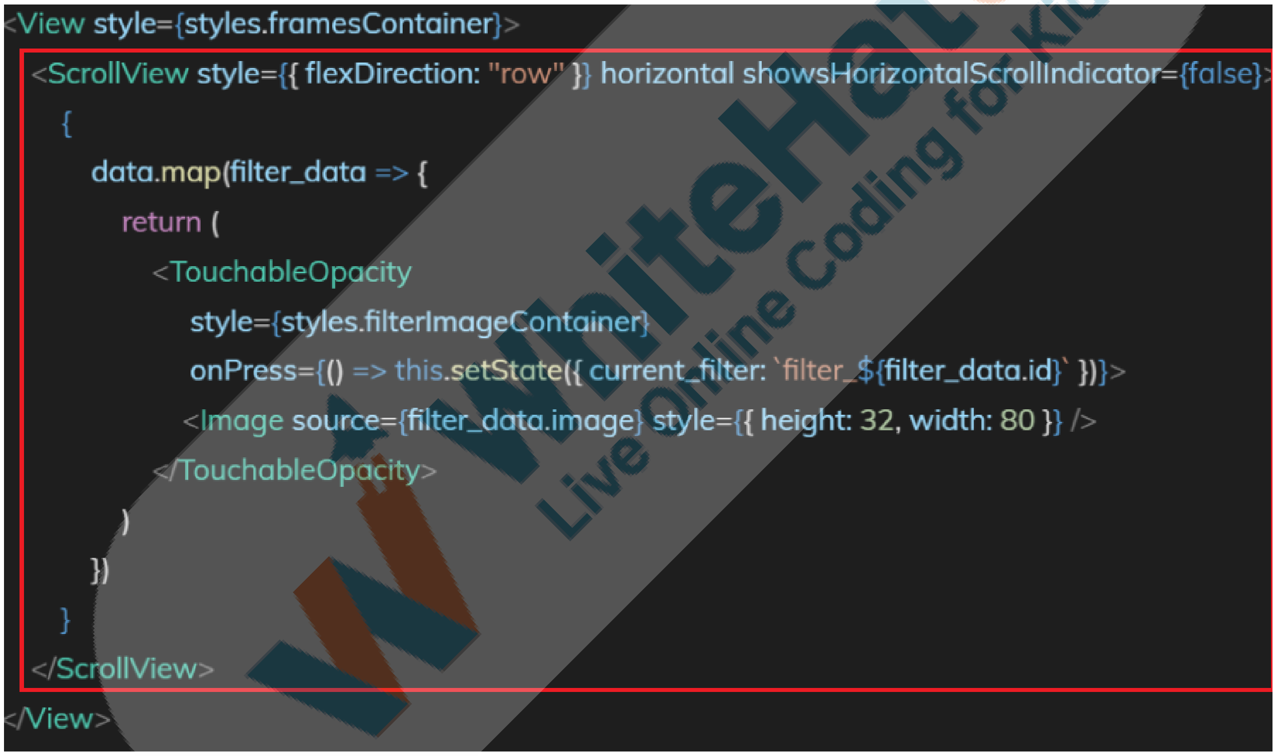
```
import {
    StyleSheet,
    Text,
    View,
    SafeAreaView,
    StatusBar,
    Platform,
    ScrollView,
    TouchableOpacity,
    Image
} from 'react-native';
```

 ```constructor(props) { super(props) this.state = { hasCameraPermission: null, faces: [], current_filter: "filter_1" }```		
	Now we will have to **update** the **value of the state variable** based on which image filter is tapped so that its respective filter can be rendered. For this we will: ● Take a **data** object to assign a unique id to each image source that can be used to update the state variable value. ● Add the **<ScrollView>** with **flexDirection** as "**row**" which will help us scroll from right to left horizontally. ● Loop through the **data** object to add **<TouchableOpacity>** component: ○ Add the style using **filterImageContainer** style. ○ Add **onPress()** method to set **current_filter** state value using **setState()** method. ○ Add the image source.	

./screens/Main.js



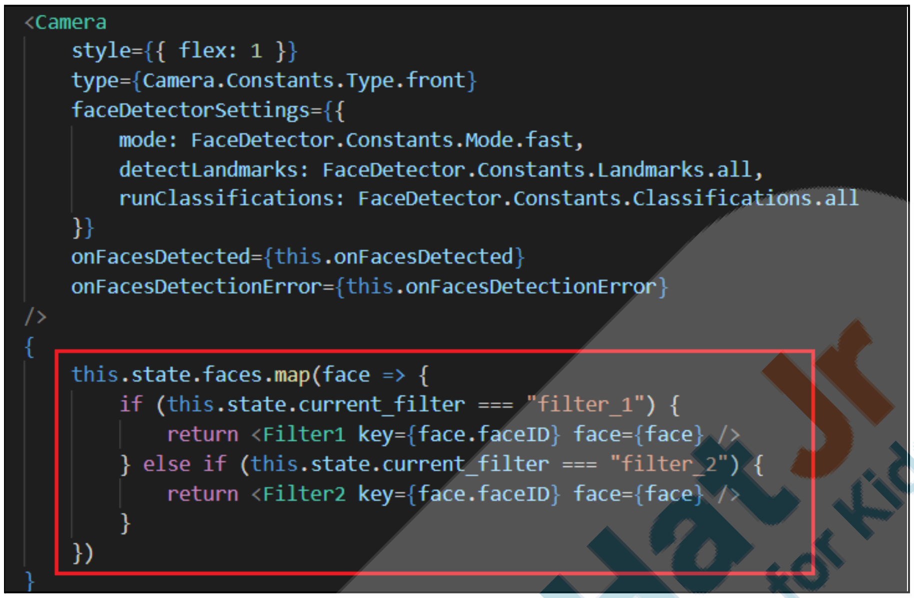
```
let data = [
    {
        "id": "1",
        "image": require('../assets/glasses.png')
    },
    {
        "id": "2",
        "image": require('../assets/glasses-round.png')
    },

]
```



```
<View style={styles.framesContainer}>
  <ScrollView style={{ flexDirection: "row" }} horizontal showsHorizontalScrollIndicator={false}>
    {
      data.map(filter_data => {
        return (
          <TouchableOpacity
            style={styles.filterImageContainer}
            onPress={() => this.setState({ current_filter: `filter_${filter_data.id}` })}>
            <Image source={filter_data.image} style={{ height: 32, width: 80 }} />
          </TouchableOpacity>
        )
      })
    }
  </ScrollView>
</View>
```

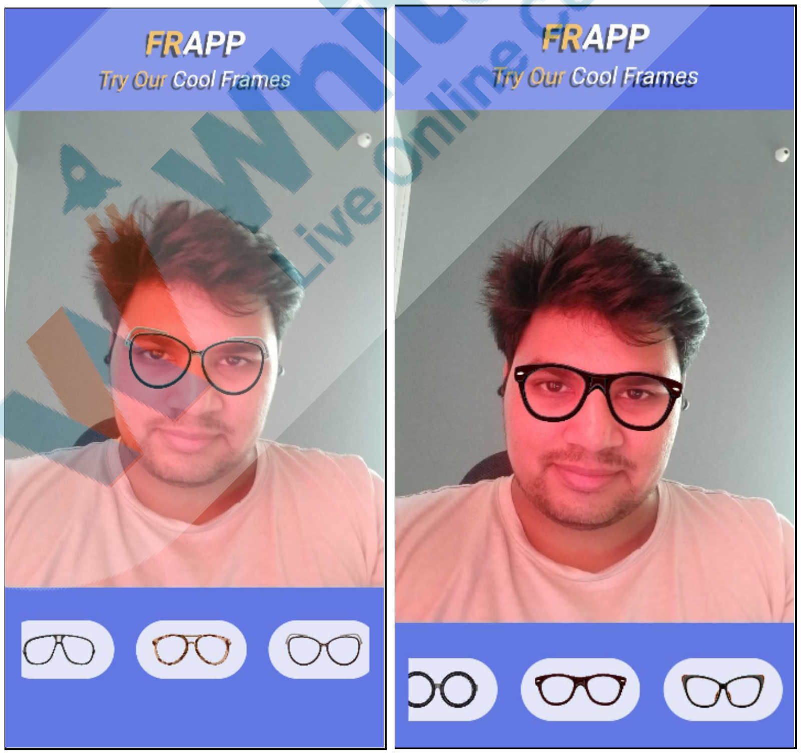
Now we will return the **Filter1** and **Filter2** components (created in the previous class) based on the value of the **current_filter** state variable.

./screens/Main.js



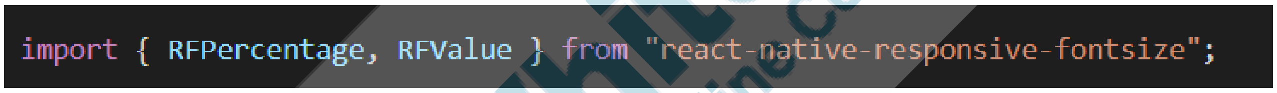
```
<Camera
    style={{ flex: 1 }}
    type={Camera.Constants.Type.front}
    faceDetectorSettings={{
        mode: FaceDetector.Constants.Mode.fast,
        detectLandmarks: FaceDetector.Constants.Landmarks.all,
        runClassifications: FaceDetector.Constants.Classifications.all
    }}
    onFacesDetected={this.onFacesDetected}
    onFacesDetectionError={this.onFacesDetectionError}
/>
{
    this.state.faces.map(face => {
        if (this.state.current_filter === "filter_1") {
            return <Filter1 key={face.faceID} face={face} />
        } else if (this.state.current_filter === "filter_2") {
            return <Filter2 key={face.faceID} face={face} />
        }
    })
}
```

Now let's test the output using expo.

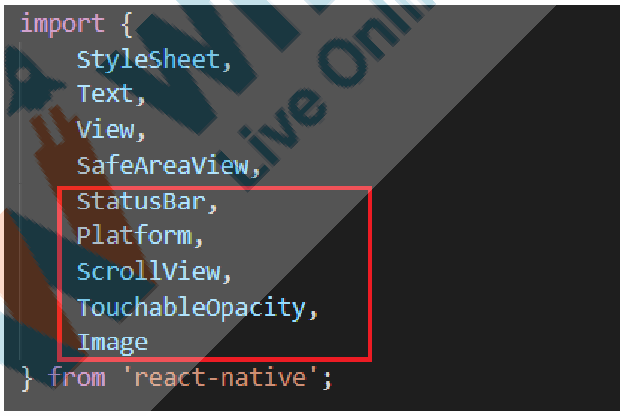


	That's really amazing! We added multiple glasses filters. We can try out any filter just by tapping on it. Now you will have to add multiple filters in the app. Are you excited?	**ESR**: Yes!
Teacher Stops Screen Share		
	Now it's your turn. Please share your screen with me.	
Teacher Starts Slideshow **Slide 11 to 12** Refer to speaker notes and follow the instructions on each slide.		
We have one more class challenge for you. Can you solve it? Let's try. I will guide you through it.		
Teacher Ends Slideshow		
STUDENT-LED ACTIVITY - 20 mins		
● **Ask the student to press the ESC key to come back to the panel.** ● **Guide the student to start screen share.** ● **Teacher gets into fullscreen.**		

ACTIVITY		
● **Design the app UI.** ● **Add multiple filters in the app.**		
Step 3: **Student-led Activity** **(20 mins)**	*The teacher guides the student to clone the code from Student Activity 1.* ***[Student Activity 1]*** ***Note**: The student will repeat teacher activity for different filter images.* *Guide the student to create and set up the react project.*	
	Guide the student to import library components.	



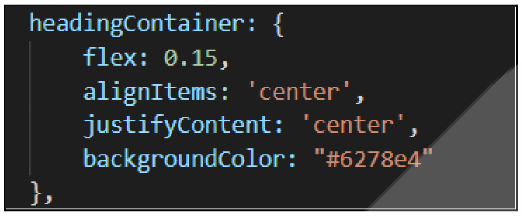
```
import { RFPercentage, RFValue } from "react-native-responsive-fontsize";
```



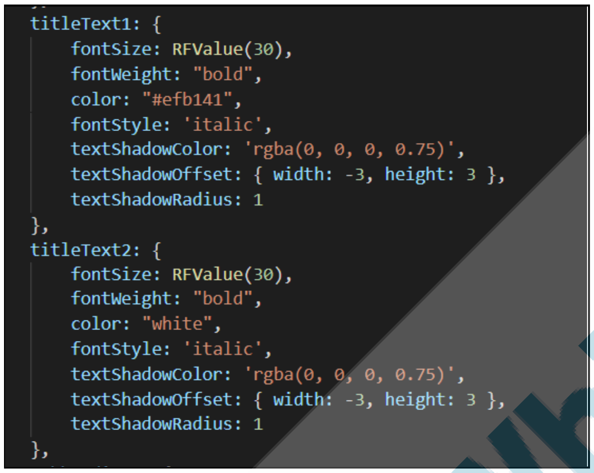
```
import {
    StyleSheet,
    Text,
    View,
    SafeAreaView,
    StatusBar,
    Platform,
    ScrollView,
    TouchableOpacity,
    Image
} from 'react-native';
```

	Guide the student to add the style for each container: ● *Heading* ● *App name text 1* ● *App name text 2* ● *Subheading text 1*	

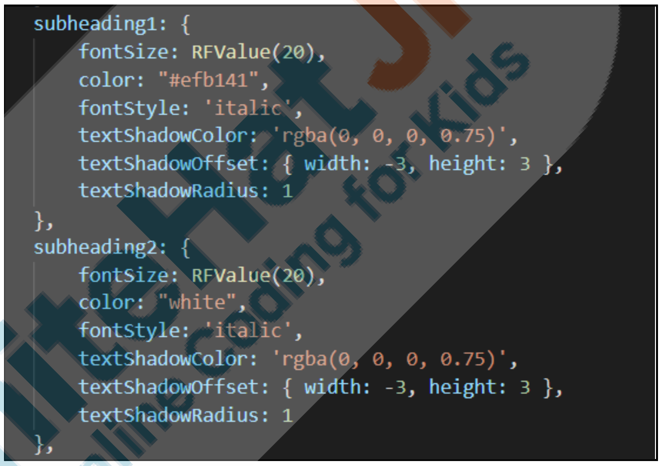
	• *Subheading text 2* • *Frames container* • *Images container*	



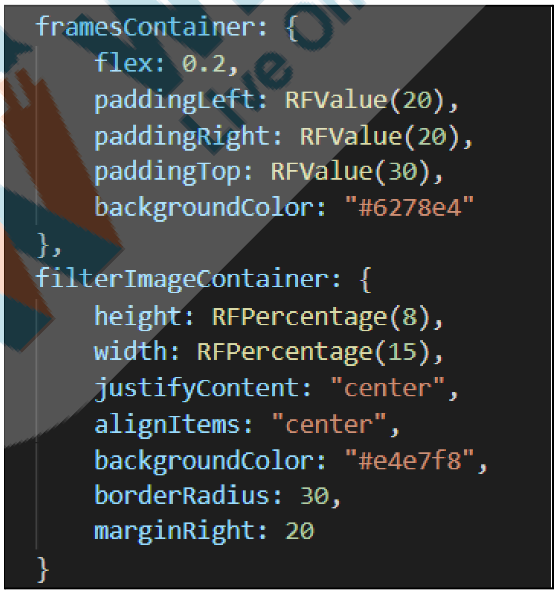
```
headingContainer: {
    flex: 0.15,
    alignItems: 'center',
    justifyContent: 'center',
    backgroundColor: "#6278e4"
},
```



```
titleText1: {
    fontSize: RFValue(30),
    fontWeight: "bold",
    color: "#efb141",
    fontStyle: 'italic',
    textShadowColor: 'rgba(0, 0, 0, 0.75)',
    textShadowOffset: { width: -3, height: 3 },
    textShadowRadius: 1
},
titleText2: {
    fontSize: RFValue(30),
    fontWeight: "bold",
    color: "white",
    fontStyle: 'italic',
    textShadowColor: 'rgba(0, 0, 0, 0.75)',
    textShadowOffset: { width: -3, height: 3 },
    textShadowRadius: 1
},
```

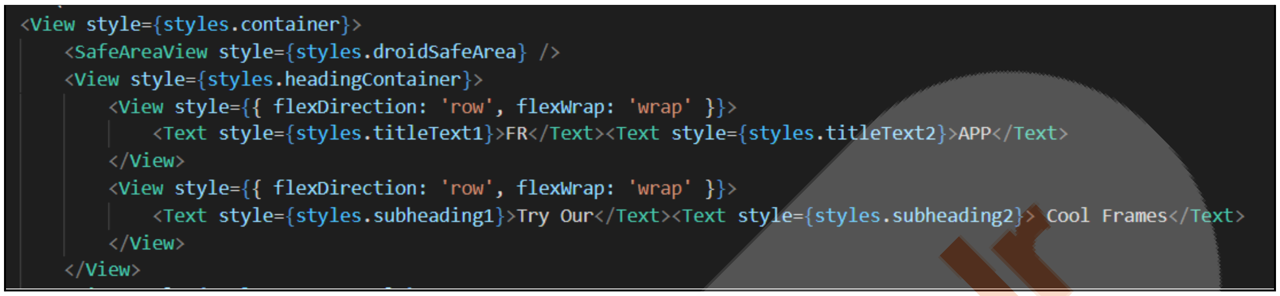


```
subheading1: {
    fontSize: RFValue(20),
    color: "#efb141",
    fontStyle: 'italic',
    textShadowColor: 'rgba(0, 0, 0, 0.75)',
    textShadowOffset: { width: -3, height: 3 },
    textShadowRadius: 1
},
subheading2: {
    fontSize: RFValue(20),
    color: "white",
    fontStyle: 'italic',
    textShadowColor: 'rgba(0, 0, 0, 0.75)',
    textShadowOffset: { width: -3, height: 3 },
    textShadowRadius: 1
},
```



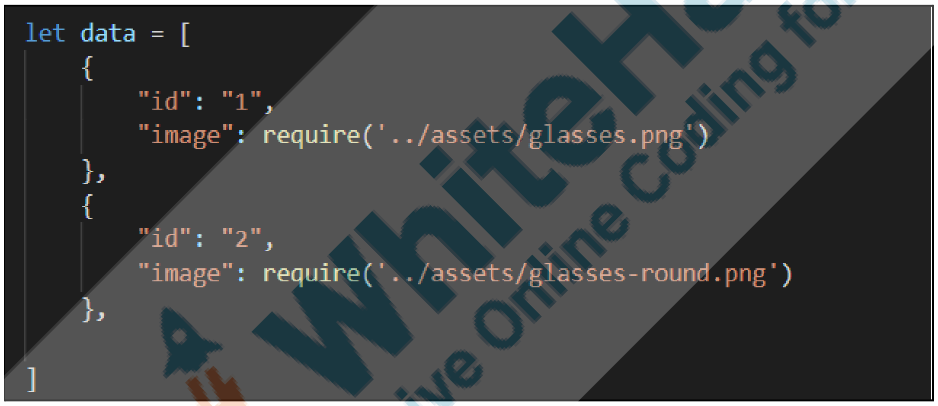
```
framesContainer: {
    flex: 0.2,
    paddingLeft: RFValue(20),
    paddingRight: RFValue(20),
    paddingTop: RFValue(30),
    backgroundColor: "#6278e4"
},
filterImageContainer: {
    height: RFPercentage(8),
    width: RFPercentage(15),
    justifyContent: "center",
    alignItems: "center",
    backgroundColor: "#e4e7f8",
    borderRadius: 30,
    marginRight: 20
}
```

Guide the student to write a return method to render text.



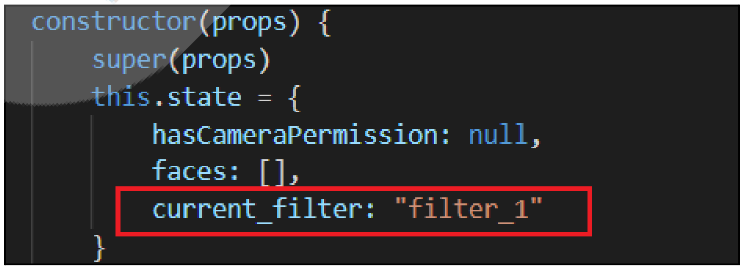
```
<View style={styles.container}>
    <SafeAreaView style={styles.droidSafeArea} />
    <View style={styles.headingContainer}>
        <View style={{ flexDirection: 'row', flexWrap: 'wrap' }}>
            <Text style={styles.titleText1}>FR</Text><Text style={styles.titleText2}>APP</Text>
        </View>
        <View style={{ flexDirection: 'row', flexWrap: 'wrap' }}>
            <Text style={styles.subheading1}>Try Our</Text><Text style={styles.subheading2}> Cool Frames</Text>
        </View>
    </View>
```

Guide the student to add an image data object.



```
let data = [
    {
        "id": "1",
        "image": require('../assets/glasses.png')
    },
    {
        "id": "2",
        "image": require('../assets/glasses-round.png')
    },

]
```

*Guide the student to **add** a state variable **current_filter** to change image filter value and **update** the state variable value in the render() method.*



```
constructor(props) {
    super(props)
    this.state = {
        hasCameraPermission: null,
        faces: [],
        current_filter: "filter_1"
    }
```

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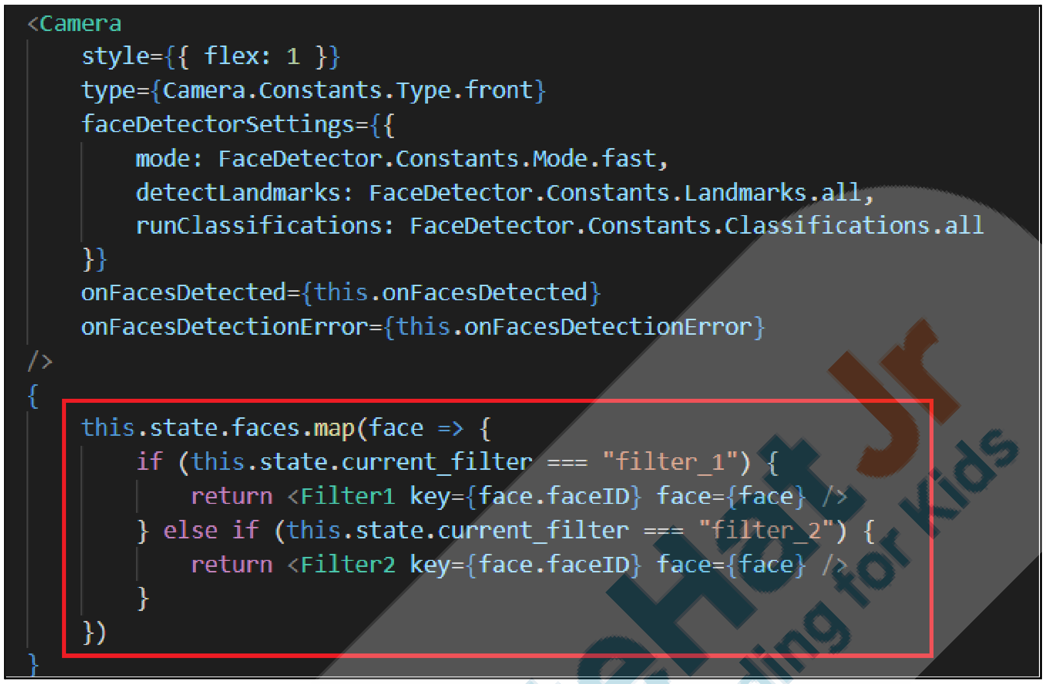
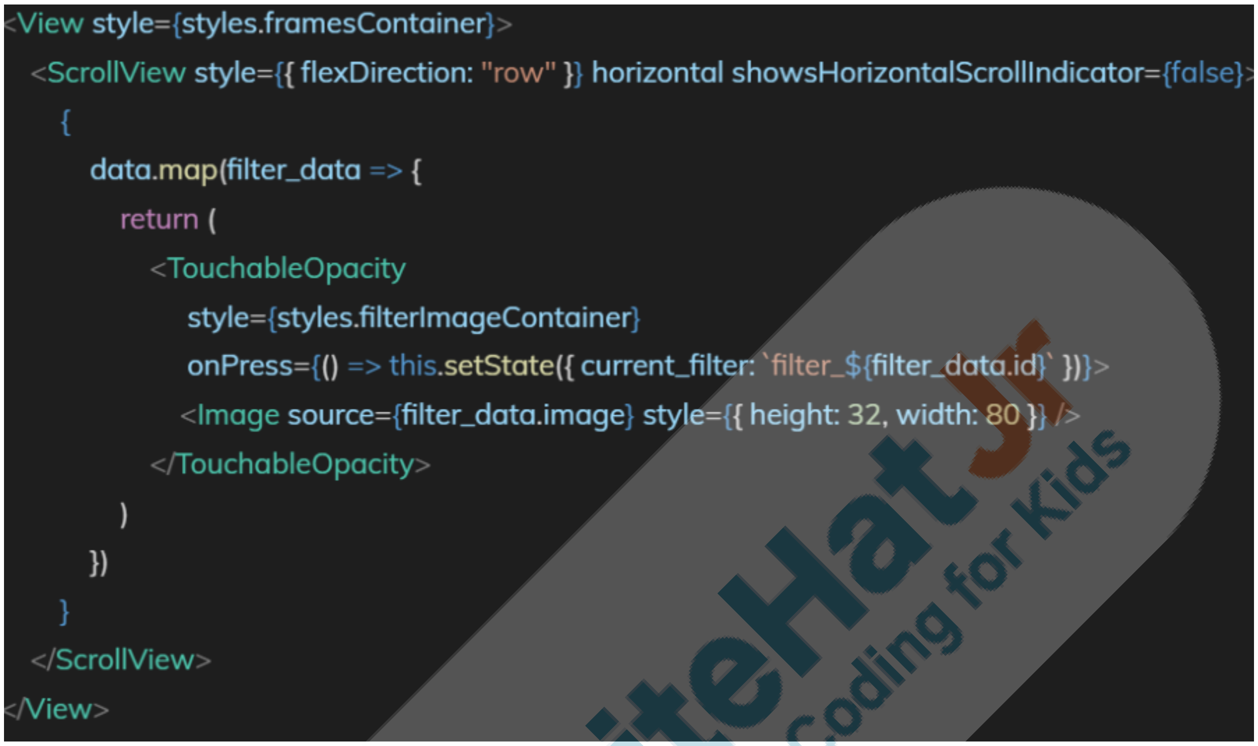


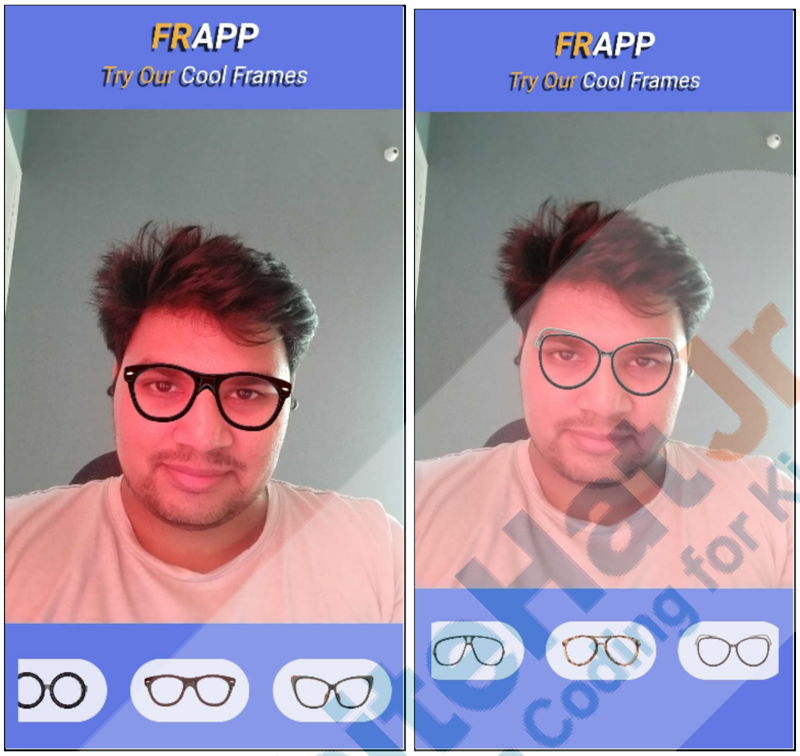
```
<Camera
    style={{ flex: 1 }}
    type={Camera.Constants.Type.front}
    faceDetectorSettings={{
        mode: FaceDetector.Constants.Mode.fast,
        detectLandmarks: FaceDetector.Constants.Landmarks.all,
        runClassifications: FaceDetector.Constants.Classifications.all
    }}
    onFacesDetected={this.onFacesDetected}
    onFacesDetectionError={this.onFacesDetectionError}
/>
{
    this.state.faces.map(face => {
        if (this.state.current_filter === "filter_1") {
            return <Filter1 key={face.faceID} face={face} />
        } else if (this.state.current_filter === "filter_2") {
            return <Filter2 key={face.faceID} face={face} />
        }
    })
}
```

	Guide the student to write a return method to render images.	



```
<View style={styles.framesContainer}>
  <ScrollView style={{ flexDirection: "row" }} horizontal showsHorizontalScrollIndicator={false}>
    {
      data.map(filter_data => {
        return (
          <TouchableOpacity
            style={styles.filterImageContainer}
            onPress={() => this.setState({ current_filter: `filter_${filter_data.id}` })}>
            <Image source={filter_data.image} style={{ height: 32, width: 80 }} />
          </TouchableOpacity>
        )
      })
    }
  </ScrollView>
</View>
```

	Guide the student to test the output. ***Note**: Ask the student to add the other 8 filters in the app. Filter images can be found in the **assets** folder.*	



Teacher Guides Student to Stop Screen Share
WRAP UP SESSION - 5 mins
Teacher Starts Slideshow Slide 13 to 16
Activity details **Following are the WRAP-UP session deliverables:** ● Appreciate the student. ● Revise the current class activities. ● Discuss the quizzes.
WRAP-UP QUIZ Click on In-Class Quiz

Continue WRAP-UP Session
Slide 17 to 22

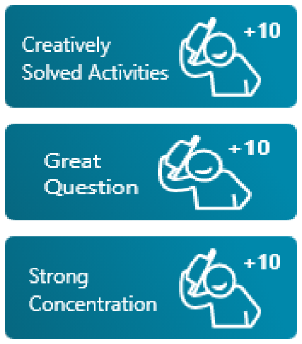
Activity Details

Following are the session deliverables:

- Explain the facts and trivia
- Next class challenge
- Project for the day
- Additional Activity (Optional)

FEEDBACK

- **Appreciate and compliment the student for trying to learn a difficult concept.**
- **Get to know how they are feeling after the session.**
- **Review and check their understanding.**

Teacher Action	Student Action
You get Hats off for your excellent work!	*Make sure you have given at least 2 Hats Off during the class for:*  Creatively Solved Activities +10 Great Question +10 Strong Concentration +10

PROJECT OVERVIEW DISCUSSION
Refer the document below in Activity Links Sections

Teacher Clicks ✖ End Class		
Additional Activities	*Encourage the student to write reflection notes in their reflection journal using markdown.* Use these as guiding questions: ● What happened today? ○ Describe what happened. ○ The code I wrote. ● How did I feel after the class? ● What have I learned about programming and developing games? ● What aspects of the class helped me? What did I find difficult?	*The student uses the markdown editor to write their reflections in a reflection journal.*

Activity	Activity Name	Links
Teacher Activity 1	Previous Class Code	https://github.com/whitehatjr/PRO-C182-Code-Ref
Teacher Activity 2	FRAPP Design Model	https://s3-whjr-v2-prod-bucket.whjr.online/9d54bf86-a6e0-4f66-b8fa-16e547591311.png
Teacher Activity 3	Final Reference Code	https://github.com/whitehatjr/PRO-C183-Code-Ref
Student Activity 1	Previous Class Code	https://github.com/whitehatjr/PRO-C182-Code-Ref
Teacher Reference 1	Project Document	https://s3-whjr-curriculum-uploads.whjr.online/fbb3f090-eef6-4569-a9c7-cbb099c5a236.pdf

Teacher Reference 2	Project Solution	https://github.com/whitehatjr/AR-PRO-C183
Teacher Reference 3	Visual-Aid	https://s3-whjr-curriculum-uploads.whjr.online/9e1b3b2f-607f-4acb-ba64-ebdab12b9362.html
Teacher Reference 4	In-Class Quiz	https://s3-whjr-curriculum-uploads.whjr.online/8061c620-ad45-46ae-bd86-b93d08238e23.pdf