

Introduction to Design (Track 3)

8.2 Hands-on: Audio Player App

Zilu Liang

www.zilu-liang.net/id3

Important!!

Please disinfectize your hands before entering the classroom!

入室前にアルコールを使用して手指消毒を行ってください。

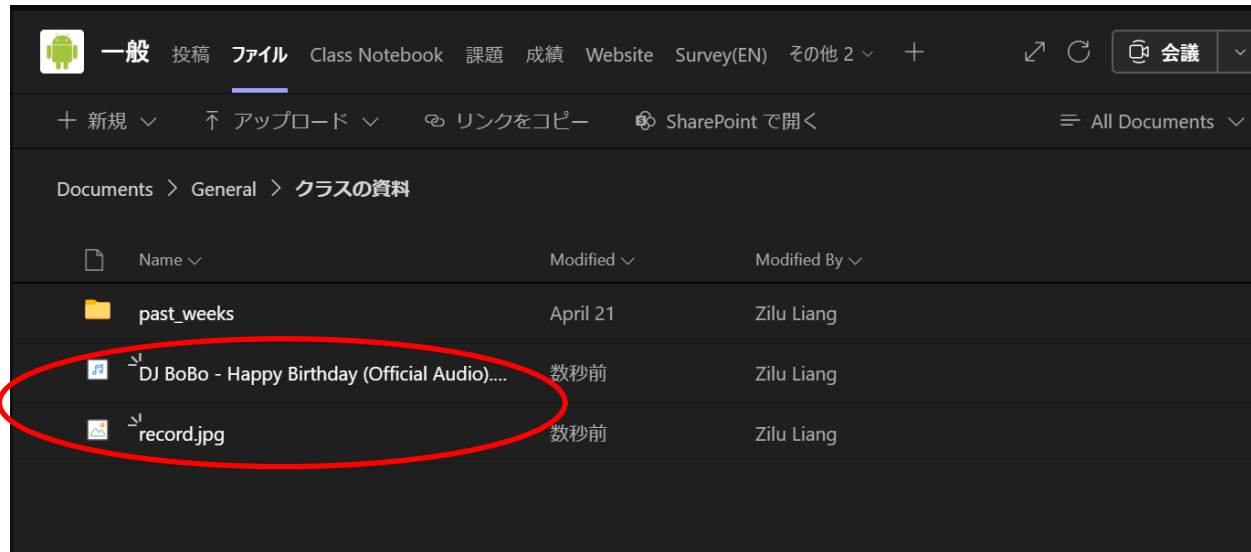
Please disinfectize your chair and table!

- ①ペーパーにアルコールを噴霧してください。
- ②アルコールが噴霧されたペーパーで、使用箇所（テーブル、椅子など）を拭き取ってください。
- ③使用済のペーパーは廊下のごみ箱に捨ててください。



Download Media Files

Download the image and audio from Teams. You can also prepare your original image and audio.



Add Canvas

The screenshot shows the IDE interface with four main panels: Palette, Viewer, Components, and Properties. In the Palette, the 'Canvas' component is highlighted with a red oval, and a red arrow points to it. In the Properties panel, the 'Height' and 'Width' properties are also highlighted with a red oval, and their values are set to 'Fill parent...'. A blue callout box with white text points to these properties.

Resize the canvas by setting the Height and Width to 'Fill parent'

Add ImageSprite

Palette

Search Components...

User Interface

Layout

Media

Drawing and Animation

- Ball
- Canvas
- ImageSprite**

Maps

Sensors

Social

Storage

Connectivity

LEGO® MINDSTORMS®

Experimental

Extension

Viewer

Display hidden components in Viewer

Phone size (505,320)

Screen1

Canvas1

ImageSprite1

Components

Screen1

Canvas1

ImageSprite1

Rename Delete

Media

record.jpg

Upload File ...

Properties

ImageSprite1

Enabled

Heading 0

Height 320 pixels...

Width 320 pixels...

Interval 100

Picture record.jpg...

Rotated

Speed 0.0

Visible

X 0

Y 0

Z 1.0

Resize ImageSprite by setting the Height and Width to '320 pixels'

Upload the image file

Set the X and Y to 0

Add Buttons

The screenshot displays a software development environment with four main panels: Palette, Viewer, Components, and Properties.

- Palette:** The "User Interface" section is expanded, and the "Button" component is highlighted with a red circle. A red arrow points from this circle to the "Play" and "Stop" buttons on the mobile screen.
- Viewer:** Shows a mobile phone screen with a vinyl record image. At the bottom of the screen, there are two buttons labeled "Play" and "Stop", both of which are circled in red.
- Components:** A tree view shows the hierarchy of the application. Under "Canvas1", there are two buttons: "playButton" and "stopButton", both circled in red.
- Properties:** The "playButton" properties are visible, including "BackgroundColor", "FontSize" (14.0), "FontTypeface" (default), "Height" (Automatic...), "Width" (Automatic...), "Image" (None...), "Shape" (default), "ShowFeedback" (checked), "Text" (Play), and "TextAlignment" (center: 1).

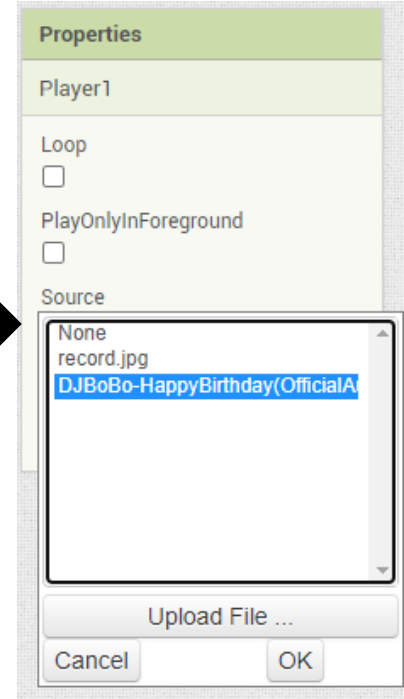
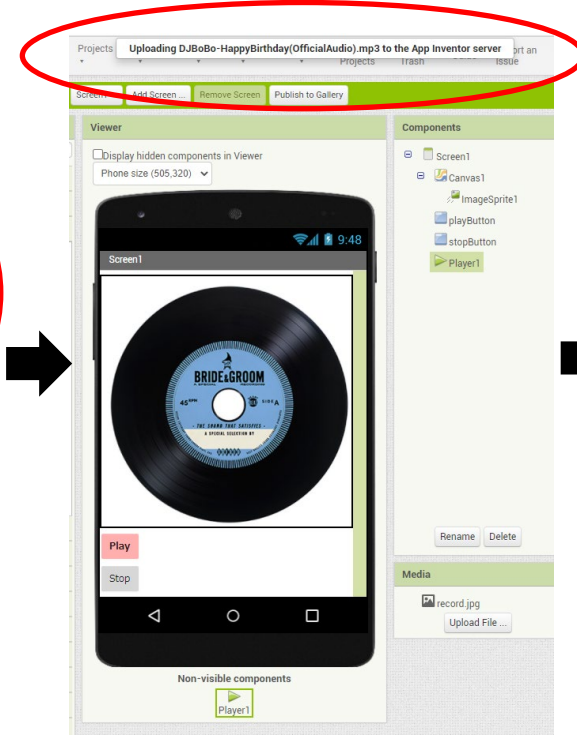
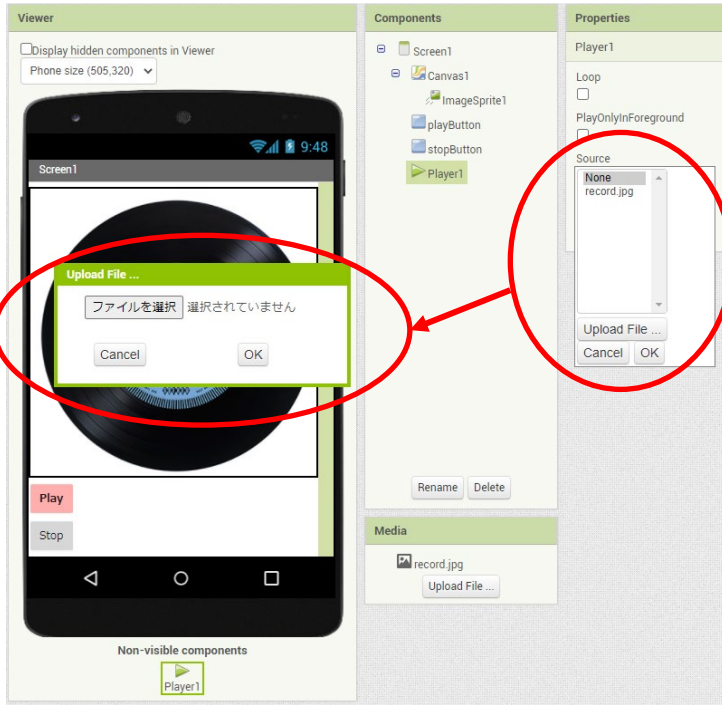
A blue callout box with white text says: "Rename the buttons properly".

Add Player

Because we need to play long audios, we should use 'Player' instead of 'Sound'

The screenshot displays the Android Studio interface with three main panes: Palette, Viewer, and Components. In the Palette, the 'Media' section is expanded, and the 'Player' component is highlighted with a red circle. A red arrow points from this circle to a 'Player1' component in the 'Non-visible components' area at the bottom of the Viewer pane. The Viewer pane shows a mobile phone screen with a vinyl record image and 'Play' and 'Stop' buttons. The Components pane on the right shows a hierarchy of components including 'Screen1', 'Canvas1', 'ImageSprite1', 'playButton', 'stopButton', and 'Player1'.

Upload Audio File



Add 'Clock' for animating the ImageSprite

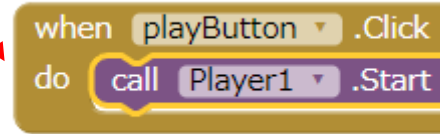
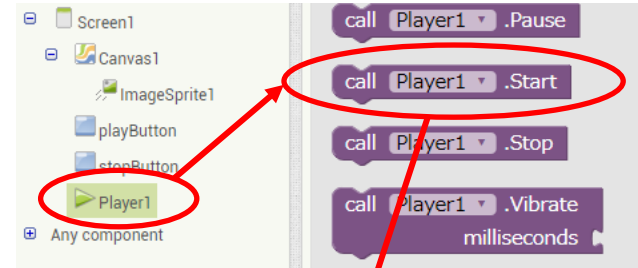
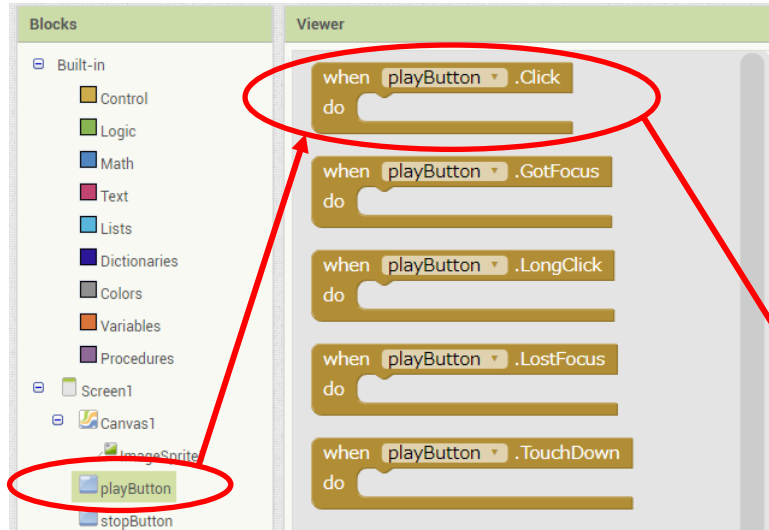
The screenshot displays the Android Studio IDE with the following components:

- Palette:** A list of components under the 'Sensors' category. The 'Clock' component is highlighted with a red oval. A red arrow points from this oval to the 'Clock1' component in the Components panel.
- Viewer:** A central window showing a mobile phone screen with a vinyl record image. Below the screen, there are 'Play' and 'Stop' buttons. At the bottom, there is a 'Non-visible components' section containing 'Player1' and 'Clock1', with 'Clock1' also highlighted by a red oval.
- Components:** A panel on the right showing the hierarchy of components: Screen1, Canvas1, ImageSprite1, playButton, stopButton, Player1, and Clock1.
- Properties:** A panel on the far right showing the properties for the selected 'Clock1' component. The properties include: TimerAlwaysFires (checked), TimerEnabled (checked), and TimerInterval (set to 1000).

Switch to blocks view

The screenshot displays the 'counterApp' interface. At the top, a green header bar contains the app name 'counterApp' on the left and a navigation area on the right with buttons for 'Screen1', 'Add Screen ...', 'Remove Screen', 'Publish to Gallery', 'Designer', and 'Blocks'. The 'Blocks' button is circled in red. Below the header, the interface is split into two main sections: 'Blocks' on the left and 'Viewer' on the right. The 'Blocks' section lists various categories: 'Built-in' (Control, Logic, Math, Text, Lists, Dictionaries, Colors, Variables, Procedures) and 'Screen1' (click_button, label). At the bottom of the 'Blocks' section is an 'Any component' option. The 'Viewer' section shows a large empty canvas. On the right side of the canvas, there is a vertical toolbar with icons for a blue backpack, a target, a plus sign, a minus sign, and a trash can. At the bottom of the viewer, there are two warning icons (a yellow triangle with an exclamation mark and a red circle with an X) and a 'Show Warnings' button.

Add click handler to 'playButton'



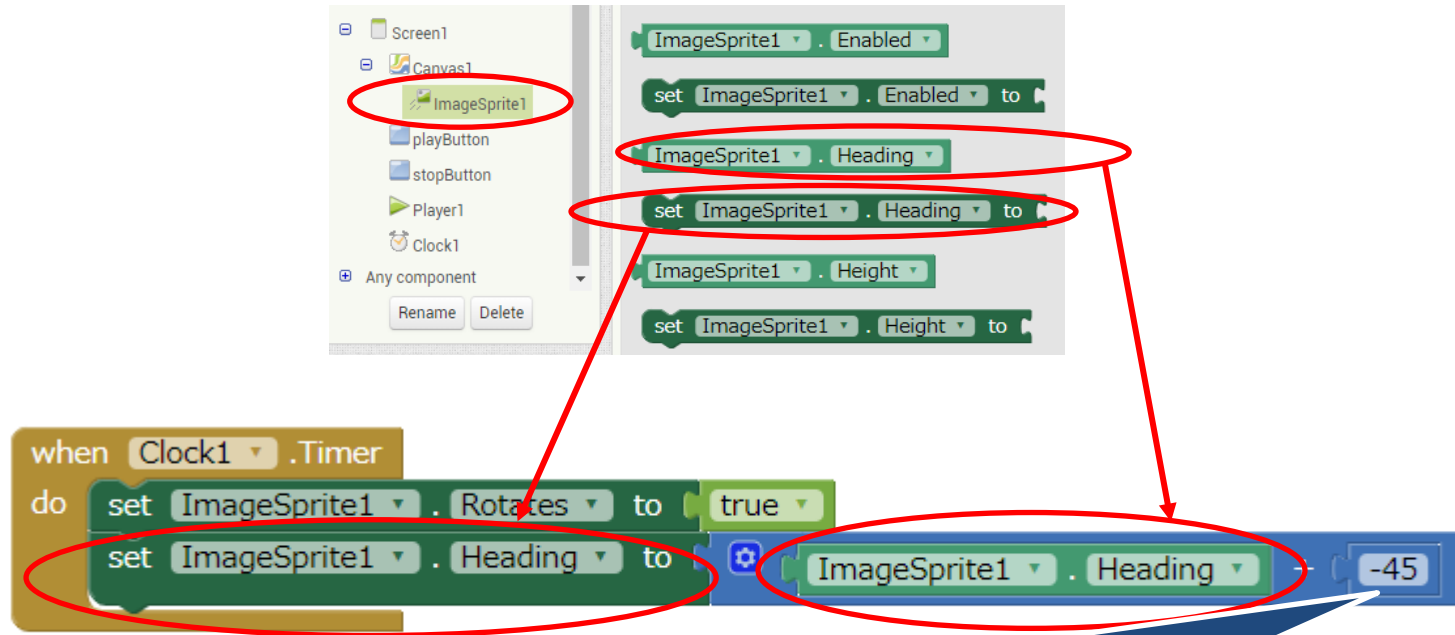
Make the record image rotate

The image consists of three screenshots from a visual programming environment, illustrating the steps to make a record image rotate. Red circles and arrows highlight the key components being modified.

- Left Screenshot:** Shows the 'Blocks' palette on the left and the 'Viewer' on the right. A 'when Clock1.Timer' block is circled in red. Below it, several 'call Clock1.Add' blocks (Days, Duration, Hours, Minutes, Months) are visible. In the 'Viewer', an 'ImageSprite1' component is circled in red.
- Middle Screenshot:** Shows the 'ImageSprite1' component in the 'Viewer' with its properties being edited. The 'Rotates' property is set to a dropdown menu, which is circled in red. Other properties like 'Speed', 'Visible', and 'Vible' are also visible.
- Right Screenshot:** Shows the 'Blocks' palette on the left and the 'Viewer' on the right. A 'true' value is circled in red in the 'Viewer', indicating the value being set for the 'Rotates' property.

The final result is shown in the bottom center, where the 'when Clock1.Timer' block is connected to a 'do set ImageSprite1.Rotates to true' block. The 'true' value is highlighted with a yellow box.

Make the record image rotate



Rotate the image clock wisely by 45 degree

Test App on Emulator

Click on the aiStarter on your computer, you should see the following window open.

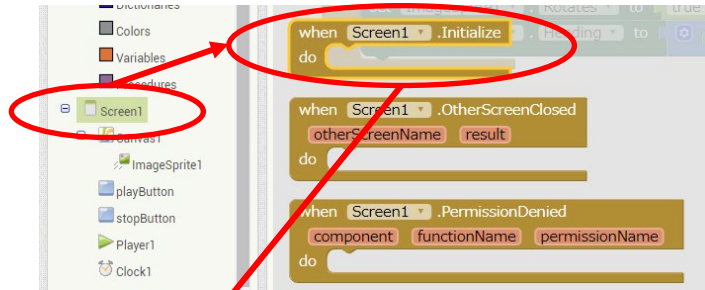
```
aiStarter
127.0.0.1 - - [21/Apr/2021 17:00:23] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:23] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:24] "GET /start/ HTTP/1.1" 200 0
127.0.0.1 - - [21/Apr/2021 17:00:24] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:24] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:24] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:24] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:24] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:24] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:25] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:26] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:27] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:28] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:29] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:30] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:31] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:32] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:33] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:34] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:35] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:36] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:37] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:38] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:39] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:40] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:41] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:42] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 - - [21/Apr/2021 17:00:43] "GET /echeck/ HTTP/1.1" 200 67
Device = emulator-5554
127.0.0.1 - - [21/Apr/2021 17:01:09] "GET /restart/emulator-5554 HTTP/1.1" 200 0
```

Did you notice any problem?

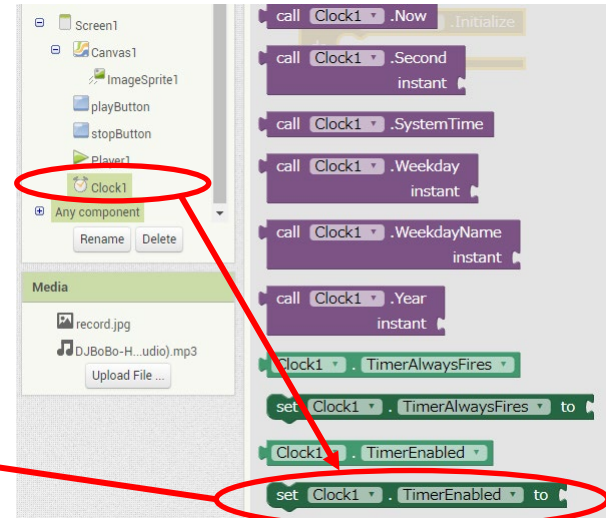
The image is rotating all the time!

What if we only want it to rotate after the
playButton is licked?

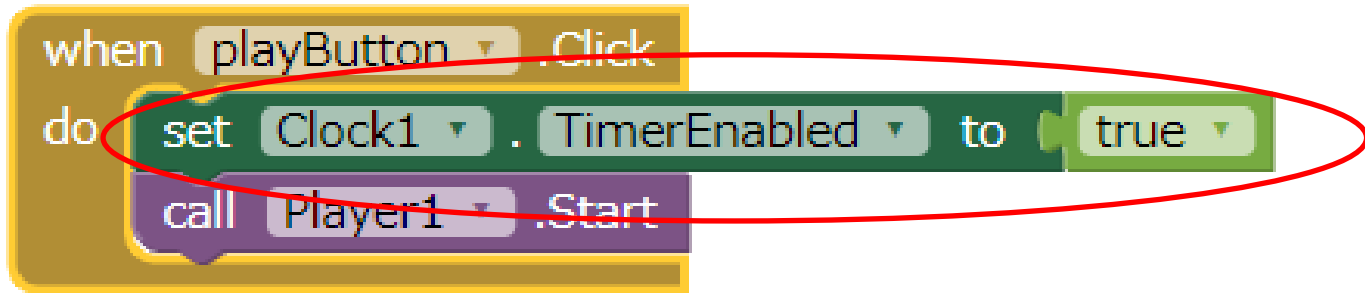
Disable the clock when app starts



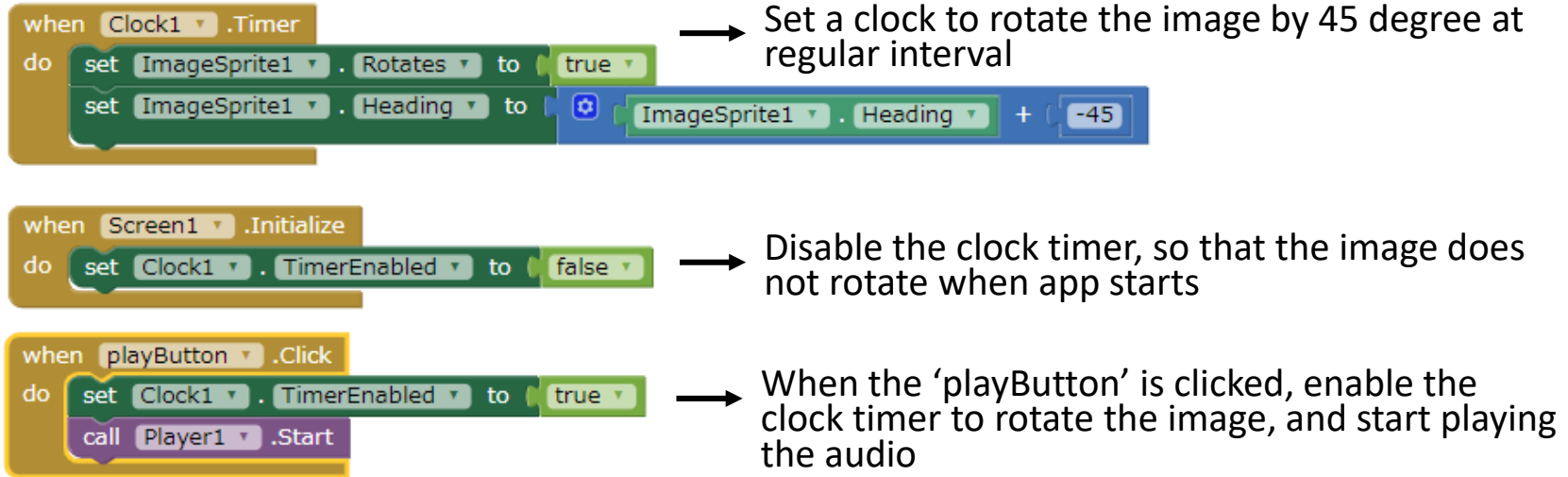
```
when Screen1 .Initialize  
do set Clock1 . TimerEnabled to false
```



Enable the clock only when 'playButton' is clicked



Code Anatomy: Audio Player App



The image displays three blocks of Scratch code, each with an explanatory text block and an arrow pointing to the code. The first block is a 'when Clock1 .Timer' event, followed by two 'do' blocks: 'set ImageSprite1 . Rotates to true' and 'set ImageSprite1 . Heading to ImageSprite1 . Heading + -45'. The second block is a 'when Screen1 .Initialize' event followed by a 'do' block: 'set Clock1 . TimerEnabled to false'. The third block is a 'when playButton .Click' event followed by two 'do' blocks: 'set Clock1 . TimerEnabled to true' and 'call Player1 .Start'.

when `Clock1` .Timer
do
 set `ImageSprite1` . Rotates to `true`
 set `ImageSprite1` . Heading to `ImageSprite1` . Heading + `-45`

→ Set a clock to rotate the image by 45 degree at regular interval

when `Screen1` .Initialize
do
 set `Clock1` . TimerEnabled to `false`

→ Disable the clock timer, so that the image does not rotate when app starts

when `playButton` .Click
do
 set `Clock1` . TimerEnabled to `true`
 call `Player1` .Start

→ When the 'playButton' is clicked, enable the clock timer to rotate the image, and start playing the audio

Assignment

8.1 Complete the hands-on tasks in the tutorial

- ✓ If you finish all the steps in class, show your Audio Player App to one of the instructors before you leave
- ✓ If you cannot finish all the steps, you can work on them after class and show your app to one of the instructors in the class next week

Assignment (Optional)

If you have time, why not adding more features to the app?

8.2.1 Make the 'Stop' button work: when the 'Stop' button is clicked, the audio player will stop playing and the image will stop rotating.

8.2.2 Add a 'Pause' button on the UI; when the 'Pause' button is clicked, the audio player will pause, and the image will stop rotating.

KUAS

KYOTO UNIVERSITY of ADVANCED SCIENCE

京都先端科学大学