

# COMP1901 Project1 Application Report

## Group 13 Time Memories Imager

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## 1. Problem-solving Elements

### a. Aim of developing this application

Nowadays, when people take photos after a long time, people may want to have viewed those photos. But some phones do not have a timeline function, which people cannot view those photos with time, which means those memories will be lacking. This application--- Time Memories Imager, will create the timeline photo for users, giving a good experience when users use it to record their lives. Users can also add notes to remind how happy they are to awaken their fond memories.

### b. Problems that this application solve

Nowadays, people will be forgetting which photos take in which years, and what places when they took. This application can make the time memories gallery for

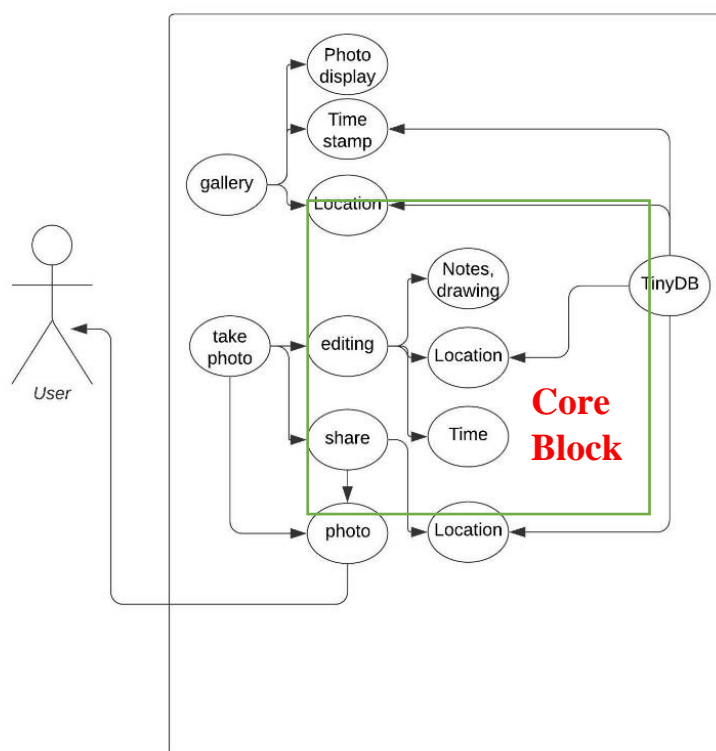
users, and also, when users want to share the photo with the contact person, they can share the file with location to the contact person. Users also can write some notes on photos which can remind them or record some ideas.

### c. Theoretical fundamental

All ideas in this application are original by our group members. With the background and some technical knowledge, we use books including App Inventor 2: create your own Android apps [1]. We also use some resources from the internet, like Android application timing format [2], the location function for MIT App Inventor [3], the Sensors function for MIT App Inventor [4], the Text Blocks for MIT App Inventor [5], the Storage function such as TinyDB for MIT App Inventor [6], and some function about load image by file location for MIT App Inventor [7].

## 2. Use Case Diagram

### a. Use Case Diagram



### b. Parts of Use Case Diagram

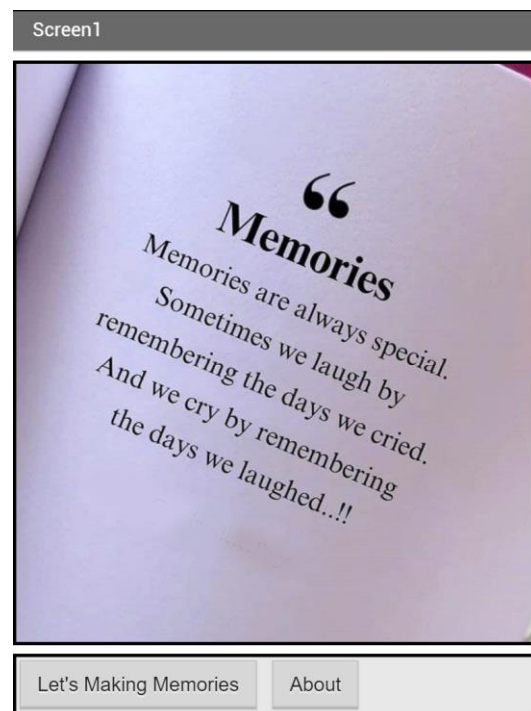
Two parts of Blocks from the Use Case Diagram, and the first core block part is the main parts of our application, which are the take photo function, file storing function, database function, timeline function, and gallery function. The second part is the additional part about the addition function, editing photos, sharing function, and

location function. Also, we decide to support two languages, English and Chinese, to be more global.

### 3. Application Functions

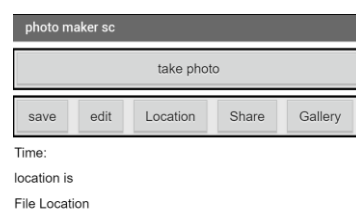
#### a. Core Functions

##### (i) Welcome screen



Welcome Screen can let users check the information about the application, and creators of this application. The button "Let's Making Memories" can let the user into the next screen.

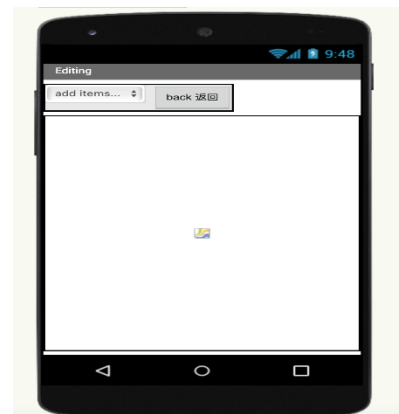
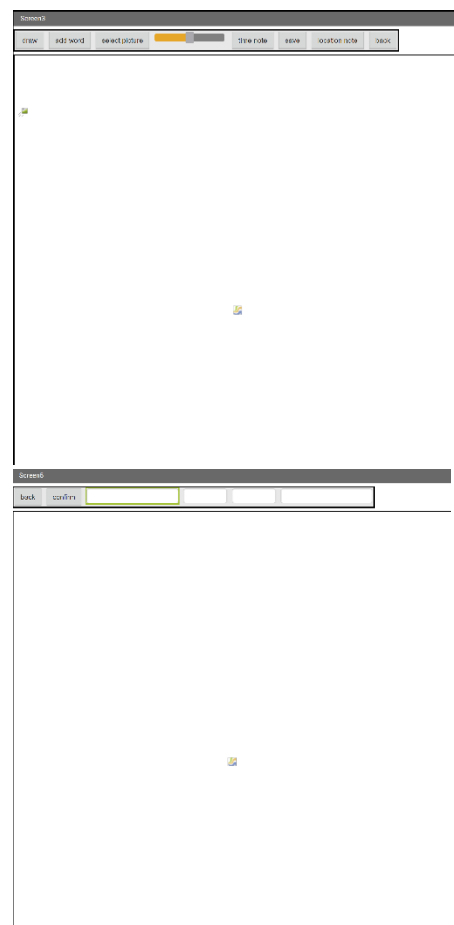
##### (ii) Take Photo Screen



The main functions of this take photo screen are taking the photo, displaying the photo,

location, and time. Also, clicking the button “edit” and “Gallery” will be going to other screens. In this screen, the application will be asking for the permissions of the storage, camera, and location GPS function. The location function needs a GPS function, which needs the user to click the “Location” button to display the location on this screen. The photo time and file location will be recorded when the user after taking the photo. Sharing function needs the user to click the “Share” button to wake up the sharing function of the phone and share the photo with the contact person with the location of that place.

### (iii) Editing Screen



The editing screen consists of the edit function and saves function.

The edit function includes ‘draw’, ‘add note’, ‘add picture’ and ‘add time’. Clicking ‘draw’ will turn the current screen to the drawing interface, where users can select the color of the pen to have a free drawing. Clicking ‘add note’ turns the noting interface to users. Users can add the (x, y) coordinates to decide where they want to note. They can also decide the size of letters by entering the figure. After the preparation, users need to click ‘confirm’ to show the note on the screen. There are ‘back’ buttons in these two extra screens that enable users to turn back to the main edit screen. Clicking ‘select picture’ enables users to select pictures from local files in their photos. After selecting, the picture will be presented on the screen. The user can drag the picture to

change the position of the picture. They can also slide the slider on the right side of 'select picture' to customize the size of the picture. Users can click 'time note' to present the current time, which is the same as the phone on the upper left corner of the screen.

The save function enables users to save the edited photo to the local file in their phone. When users click 'save', The File Manager which is the phone storage, will save the photo and a return notification to remind users that the photo has been saved successfully.

#### (iv) Gallery Screen



In this gallery screen, the application can display a maximum of four photos, and if the user takes the new photos, the new photos will replace the old photos. Moreover, the time will be shown on the top to know when users took the photos. After viewing those memories, the button "Back to Home" can remind people to take some photos now to record the new life.

### **b. Additional functions**

#### (i) Sharing

The sharing function can let users send the place location with the beautiful scenery photo to their friends to recommend them to join with this place.

#### (ii) Location

The location function can let users know the current place of this photo and share the location with friends.

#### (iii) New Photo Add-in

This function can let new photos replace the old photo automatically, and user can see their photos at the gallery screen, which displays a maximum of four photos of that year.

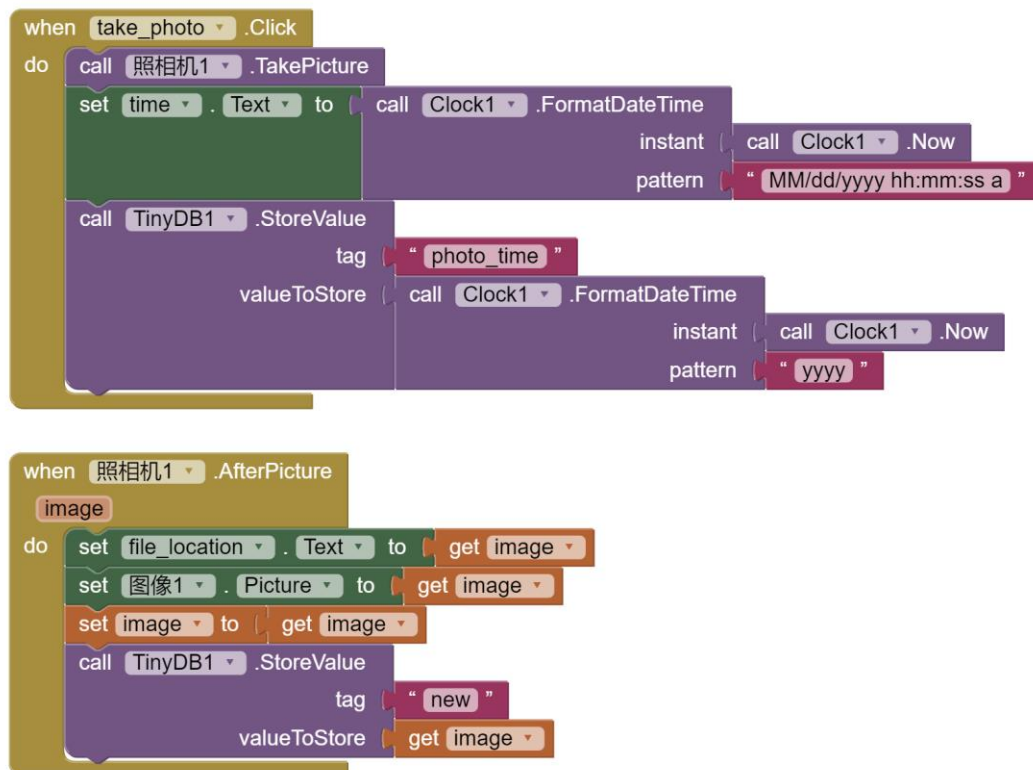
#### (iv) English and Chinese Language Support

The language support helps some people who don't know English to know how to use this application. But because we just know Chinese and English in this team, we only add these two supporting languages. Below is the part of the result:



## 6. Key Programming Blocks

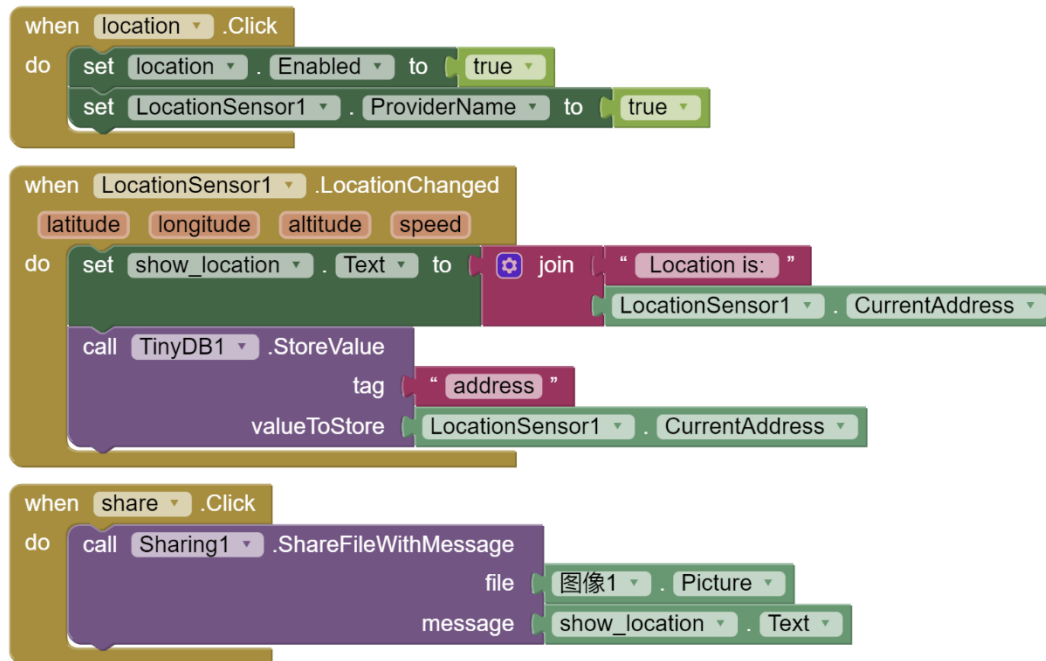
### a. The Camera Model from Taking, Time, and Saving



When the user clicks the “take\_photo” this button, the camera will be initial, and the time will be recorded to the TinyDB1 and displayed on the screen on the time label part. When the user takes a photo, the Label part will display the photo's location on

file\_location that label part, and the gallery will display the photo on the under area shown to the user. Also, TinyDB will store the file location text into the TinyDB1, which uses the tag “new” to help the subsequent pages call and adjust.

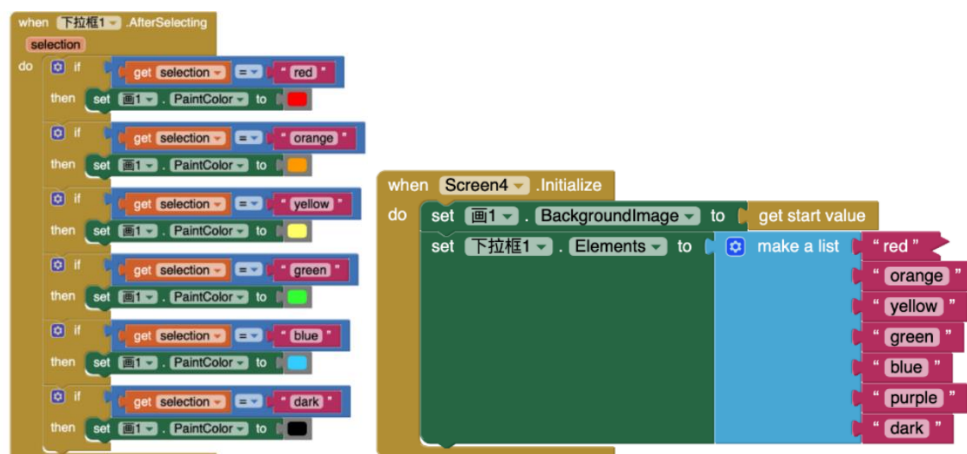
### b. The Part for Location Recording and Sharing



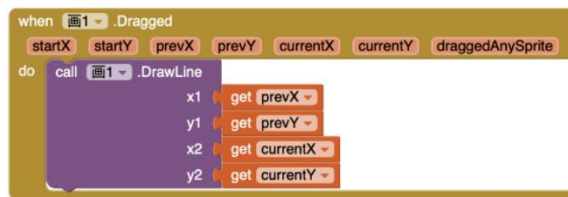
When the user clicks the button “Location”, the location needs to be enabled, and also, the Location Sensor needs to work in that time. When the device gets the GPS location, the label part “show\_location” will be shown the current address of this place and store the TinyDB1, which is tagged “address”. The sharing function needs the user to click the share button. When they click, the ShareFileWithMessage function will be called the Picture file and bring a location text message that is already recorded on the “show\_location” label part to the contactors.

### c. The Editing blocks

#### 1) Draw

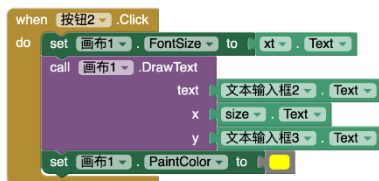


When ‘draw’ button is clicked, the screen will turn to screen 4 where elements in ‘spiner’ will be initialized as red, orange and so on. The logic block will recognize the elements users select and set the pen color to the corresponding element.



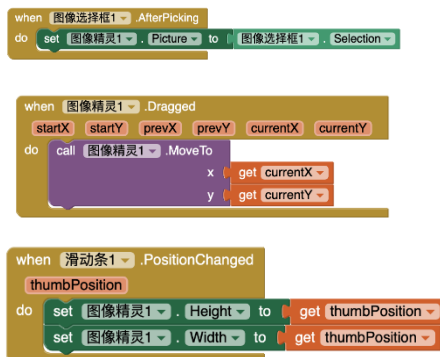
When users drag on canvas, the (x, y) coordinates will follow users' finger and call the draw line to delineate the trajectory of the finger.

## 2) add note



When ‘add note’ is clicked, a new screen will appear in the interface. In this screen, textboxes are applied to receive the input values from users. The values then will be used to set the feature of the note.

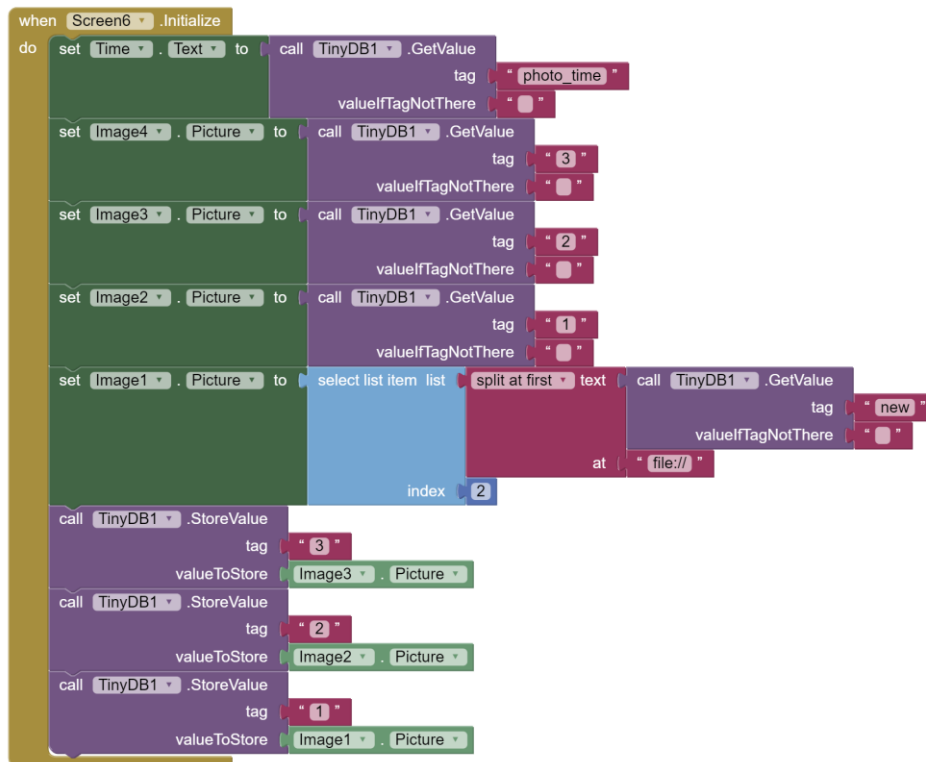
## 3) select picture



When users use ‘image picker’, the local file will be opened so that users can make the selection. After users finish selecting, the ‘image sprite’ will be endowed with the value. Users can drag ‘image sprite’ freely. The slider, which is set to correspond to the height and width of the image, can adjust the size of the picture.

## d. Photo Display Model





When the gallery screen is initial, the clock will be calling the tag “photo\_time” from TinyDB1 to get the time value, also setting the image1 picture to be the first photo or new photo, but here we need to call the file location value, which tags “new” from TinyDB1 because the file location of the recording looks like “file:///storage/emulated/0/Android/data/edu.mit.appinventor.aicompanion3/files/Pictures/app\_inventor\_1635520468718.jpg”, which the application cannot read. So, using a split function to cut the “file:///” will be ok to read. When the new image returns to the gallery, the old image1 will be transferred to image2, and the new image1 will replace the old image1. Because one page can only display four maximum image rules, when the new photos come to the gallery, the new photo will replace the old one.

## 5. Technical Challenges

### a. Member 1

The most difficult challenge I met is how to display multiple photos on the gallery screen, after I use the TinyDB to storage the file location and let it replace when I have a new photo location, and which need to connect to the time, and need to figure it out. I find every year tag will be storage the file location record in that year. So, this way, let the photo timeline become true.

### b. Member 2

One of the challenges I encounter is to transfer value. It is clear to find the control function which opens a new screen and initializes the value. But finding suitable

blocks that save the value of canvas and receiving the value in another screen is confusing at the beginning of the project. Fortunately, with inspiration from the save function, I apply 'canvas.save' to handle the issue. Another challenge is to realize the function of selecting picture and add it to canvas. It is inconvenient to directly apply 'image' to receive the value from what users select. 'image' is a visible component which occupies the space of canvas and cannot be edit on canvas. On contrast, 'image sprite' handle this problem. 'Image sprite' as an invisible component which can be edited on canvas enables users to drag it everywhere.

### **c. Member 3**

The most difficult part is testing the application and finding bugs that need to figure out, when I am testing the application, I use some testing screens to print out the content which storing in TinyDB, but sometimes difficult to correspond the tag from before, so I just formatting all the tags and tell the group members.

### **d. Member 4**

While doing the use case diagram, there may be times when I cannot think of the use cases. The use case diagram may have lacked many use cases at first, which took me some time to ensure that all use cases have been added to the use case diagram.

### **e. Member 5**

The first difficulty that I have encountered is letting the photo occupy the position of the previous one. To cope with this problem, we mainly use the functions of TinyDB and call it for few times to change the photos' positions.

The second difficulty that I have encountered is the access of the addresses of photos. The system cannot access the addresses of photos which include 'file://', and hence the functions of the gallery cannot run successfully. Fortunately, we found that a block can be used to separate 'file://' and the address of a photo. Therefore, the system can access the addresses of photos successfully.

### **f. Member 6**

When recording location was recorded, the location was not displayed. It can only display when it was put on a separate page. The bug was found through this little incident. The solution is the GPS tracking system was re-established with team members on a new page. After a series of tests were conducted, it worked success as we expected.

### **g. Member 7**

The most difficult challenge that I faced in this project was the storage problem. The problem was how to build a linkage between the local file and TinyDB. Lastly, I found the solution is to store the current location in the location file and use 'Time' to add different tags in TinyDB. Then I call back TinyDB to show the picture.

## 6. Conclusion

In this wonderful and meaningful project, all the members of our team make the first application for their own life, and we also learn a lot of knowledge not only about technology. After making this application, we found that from impossible to possible needs to be researched and work a long time, but in the way, always have the ways to solve those problems. Teamwork lets us face the difficulties together, we still will meet the problems, but the process of finding solutions which are more wonderful. Making this application also improves our self-studying abilities and research skills that cannot be trained if just learning from courses. We believe the knowledge that we learn in this class will make us go to a bright future.

## 7. References

- [1] D. Wolber, R. Roumeliotis, E. Volckhausen, and R. Demarest, *App inventor 2: create your own android apps*. Sebastopol, California: O'Reilly, 2014.
- [2] Google, "SimpleDateFormat: android developers," *Android Developers*. [Online]. Available: <https://developer.android.com/reference/java/text/SimpleDateFormat>.
- [3] D. Wolber, "Location Sensor," *Location sensor*. [Online]. Available: <https://appinventor.mit.edu/explore/content/location-sensor>.
- [4] MIT App Inventor, *Sensors*. [Online]. Available: <http://ai2.appinventor.mit.edu/reference/components/sensors.html>.
- [5] MIT App Inventor, "MIT App Inventor Text Blocks," *MIT app inventor text blocks*. [Online]. Available: <http://ai2.appinventor.mit.edu/reference/blocks/text.html>.
- [6] MIT App Inventor, *Storage*. [Online]. Available: <http://ai2.appinventor.mit.edu/reference/components/storage.html>.
- [7] MIT App Inventor, *Accessing images and sounds*. [Online]. Available: <https://appinventor.mit.edu/explore/content/accessing-images-and-sounds>.

## 8. Appendix

### a. Task distribution

Member 1: Jiang Guanlin (Photo Location, Timeline, research for photo display, deal with some difficult problems that group members meted, and research those problems)

Member 2: Huang Tianji (Photo Editing, Storage Photo, Rename Photo, Add notes and extra pictures to Photo)

Member 3: Hong Yuling (Gallery, testing whole application and reporting the errors)

Member 4: Lau Choi Yu Elise (Display, information research, Forming the Application, Use Case Diagram)

Member 5: Lam Wan Yuet (Gallery, information research)

Member 6: Yang Xiao Lin (Some Parts of location recording with Sharing function, Use Case Diagram, add English and Chinese languages supporting)

Member 7: Lam Ho Yan (Storage, Formatting the Application and display perfectly, Research the information about Clock, Location)

### b. Individual Report

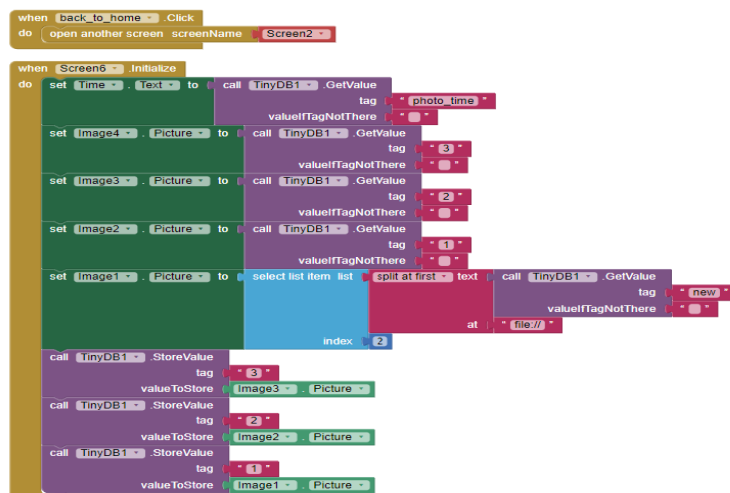
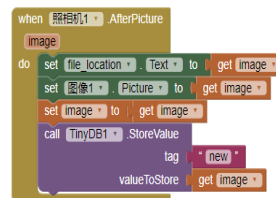
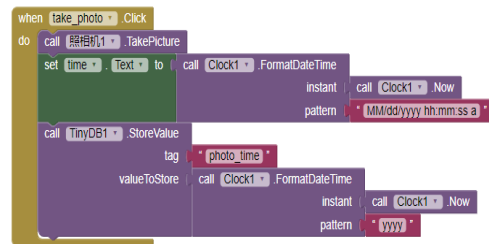
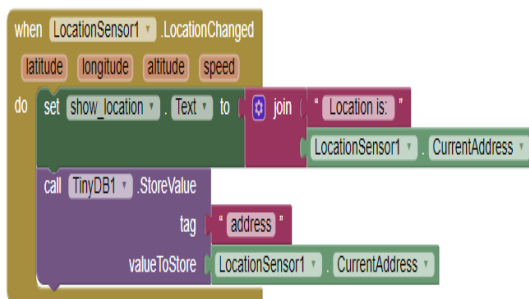
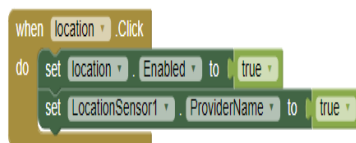
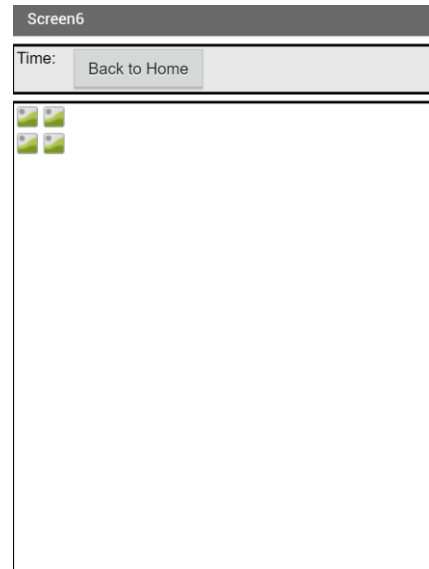
#### (i) Member 1: Jiang Guanlin

In this project, because I am the leader of Group 3, first group meeting, we talk about which topic we will choose to make this application. We brainstormed a lot but still used my idea in the end. Because everyone is offline now for our group, I make a WhatsApp Group be our group discussion and file upload place. Also, I let them four days be a range to give me some reports about their research and some ideas about additional functions. After, according to our voting, we made some decisions. Also, we used ZOOM Meeting software had an online meeting to discuss the use case diagram for our application which a member of our team drew.

After this meeting, I started to plan the parts that everyone will be doing in this application. We, in the report, met with the professor and confirmed the feasibility of this application. So, we started it, also make sure the application useage range and the how many functions we have to make.

In this project, we used aia file to transfer the parts to group members. Still, after, we found that way was so slow and not suitable for teamwork, so thanks Huang Tianji, he provided his Google Account to us, so I moved some parts of the programming blocks to the new account. After the first version of the application, we found a lot of bugs in there, so I decided to redesign the programming blocks, and some people reformed the application display to be more beautiful and easier to use.

In this project, I develop the functions of location, timeline, and storing those data into TinyDB. Below is the code blocks and some parts of screens which I contribute (some shared blocks are not displayed here, also exclude the blocks help members):



The location and timeline functions are not complex parts for me, but I still spent some time figuring out the location problem. The GPS location is so slow, but after I found that is not the application problem (MIT AI2 Companion Application make it slow). Also, I used the exact time to show on the application, but I decided to store it twice on TinyDB because the precise time is not suitable for the gallery timeline. In this gallery section, the label on this screen just shows the year. Also, I put the website link that I found into the discussion part on Blackboard.

<input type="checkbox"/>	10/30/21 9:29 AM	MIT APP INVENTOR cut string	 Guanlin JIANG	Published			1
	10/22/21 1:03 PM	Share a way for map and location	 Guanlin JIANG	Published			1

To be the group 3 team leader, I take the responsibility to solve complex problems if they cannot solve them. Every week I will recover some problems members cannot solve to ask the professor or student helpers and figure out those problems to help members. Also, I must encourage team members when they meet some difficulties, and I need to make sure everyone finishes their jobs and check all blocks are suitable for our application.

For testing those functions, I especially add some screens to display the information to make sure those functions are working correctly. I remember when I finally tested the gallery block, I found the bug and also contacted the member who developed this block to figure out the problems. In the end, we found that when the function initial, the string split is not correct, and we fixed that problem. When I developed the location function, I also started a new project to test it ok for display or not.

Also, in this project, I know a group leader must not panic when a team meets some problems. A group leader needs to be organized matters methodically, also make some stable or responsible decisions to make sure the group is not unstable. The best feeling is to work with group members to figure out those difficulties and test the application to make sure no bugs exist.

### **My Reflection:**

Every week, sometimes every day, we will discuss in our WhatsApp group, and every week I will receive some difficulties from members to figure out if they cannot solve. Also, I collected all the team members free time to So that everyone could meet and work together.

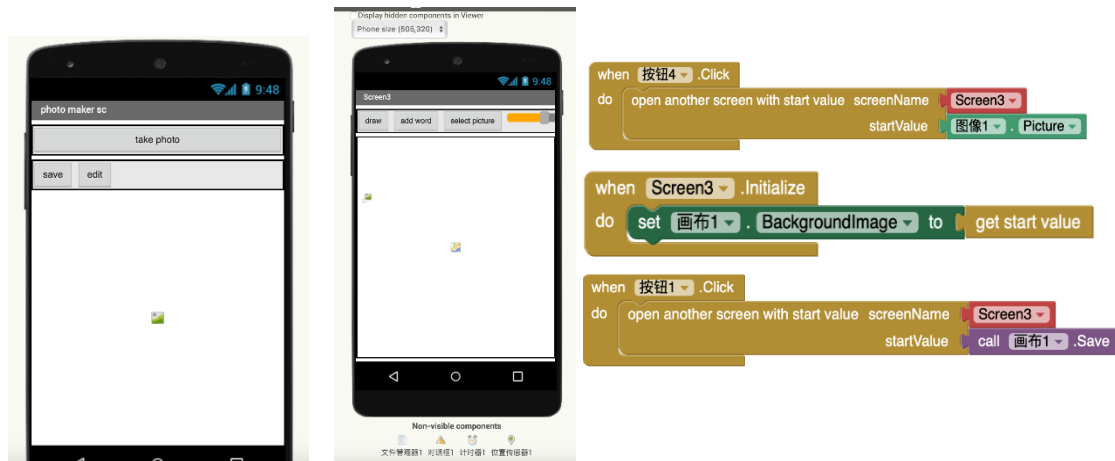


Overall, the experience of this project made me feel very happy to be in a team and work together to figure out the difficulties. Teamwork skill is very important for my whole life, also pass through this project, I am thrilled to cooperate with those members. To be the team leader for this project, this project also makes me and teach me how to be a leader and lead the whole team and self.

## (ii) Member 2: Huang Tianji

### My contributions

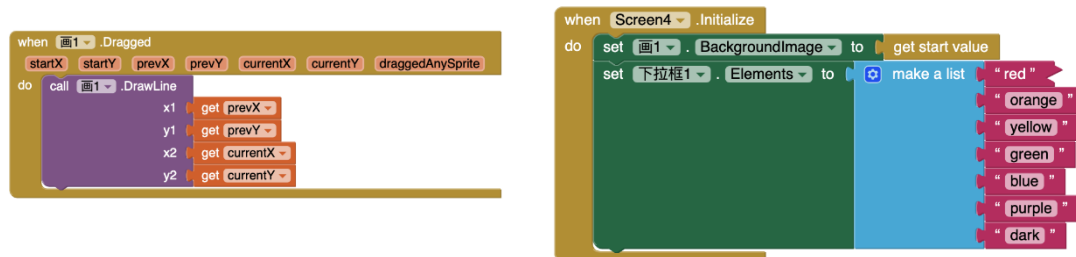
At the beginning of the project, I create the draft structure of the application so that our team can create blocks more logically based on the structure. To realize the shifting among different screens, I try on the value pass blocks. However, at first there are several bugs on the value passing. For example, when I take the photo in screen 2 and press the shift button to screen 3 expecting to see the photo presenting in screen 3, unfortunately, there's nothing there. I figure out that I didn't apply the blocks to receive the value. Therefore, I add a button in screen 3 which is used to receive the value when being clicked. Nevertheless, after conducting several trials on the screen 3, I find the button is inconvenient for user to edit since we sometimes directly press the edit button without press the value-receiving button. Thus, I try the initialization blocks which enables the photo to present itself automatically. In addition, to simplify the editing process I apply 'back' button so that we can send the picture edited in different screens back to one screen to save.





I also contribute the function of editing include adding picture, adding note, drawing with color pen, printing time on picture. To freely editing the picture, I apply the canvas blocks. After this, all the save functions, editing functions and shifting functions are working based on canvas.

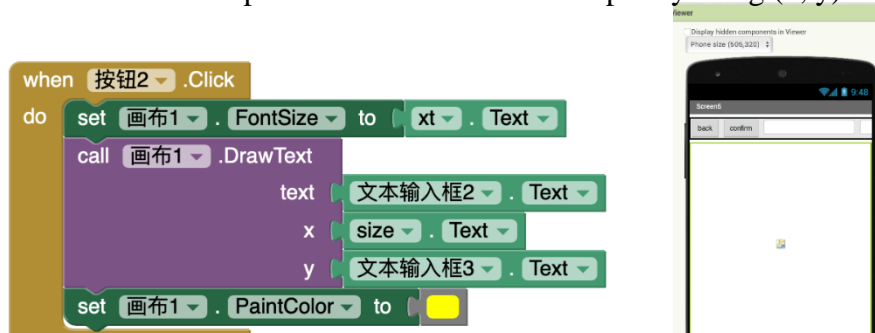
To realize the function of selecting pen color, I apply the spinner. However due to the bugs in input, I fail to set the options in designer section. Therefore, I apply the initialized blocks to define the options as values when the new screen is called.



After the options are defined, I start to set the color of pen by using logic blocks and math blocks.



To realize the function of adding notes, apply the textbox. The textbox decides the size of the letter and the place where the note can be put by using (x, y) coordinate.



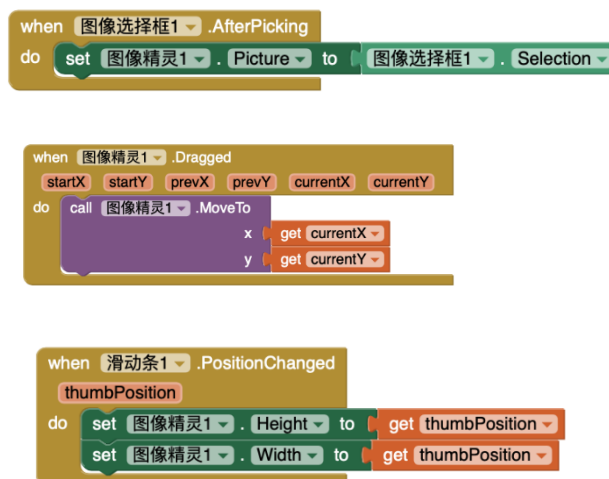
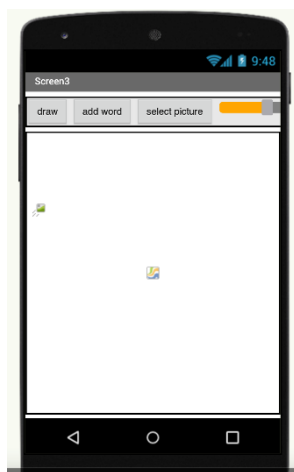


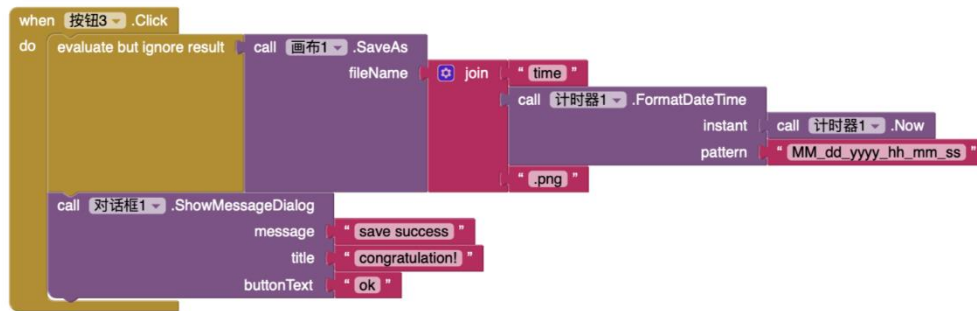
To realize the function of adding time to the photo, I apply the clock. I use the button to call the clock and return the time as text on the canvas.



It is approximately smooth to realize the functions above. However, when I try to add pictures to the canvas, I encounter some challenges. First, I have to create a function to select pictures from local files. This process is simple, I apply the image picker so that I can do the selection. Nevertheless, how to receive the image and present it on canvas is challenging. I initially try the image component to receive photo. However, I find it hard to add the image component on canvas. Worse still, the image is a visible component which will occupy the space of canvas regardless of whether the image is uploaded. I've tried several ways to handle this problem. Eventually, I decide to apply imagesprite. There are several advantages of it. First of all, the imagesprite can be added to the canvas. Secondly, the imagesprite is an invisible component which will not occupy the space. Thirdly, the imagesprite is flexible. It has a built-in function which enables the user to move it. Although the imagesprite has solved the challenges above, it creates new confliction with the drawing function. When I drag the imagesprite, I will create a chaotic pen line at the same time. This is because I set the same trigger condition for drawing function and adding picture function. Therefore, to avoid them acting at the same time, I move the draw function to another screen.

Meanwhile, to enable the user freely to change the size of image, I apply the slider to control.





I also contribute to the local saving function. To enable the gallery function to arrange the order of photo by name, I call the clock to access time and named the photo with time. In addition, to remind the user the saving is successful, I apply notifier.

To enable teammates to carry out the application more conveniently, I contribute my Gmail account so that we can do the project without packing the APK file. Document.



## Reflection

I have learned a lot from the project. I used to work on the project on myself in the past, but this application program changes some of my views. I realize the importance of sharing ideas with others. In the past, I always got stuck on the progress since I have no idea of what to do. But from this learning process, I find the obstacle I used to find hard to overcome becomes easy. The team members' concepts are sometimes inspiring, they offer new angles for me to rethink the problems. Additionally, I also realize the power of unity. When facing a huge project, it is of great difficulty for one to handle within a limited time. Therefore, the teamwork shows its great power for it enables us to gather the strength of every individual. Meanwhile, I also reflect some deficiencies in the teamwork. At the beginning of the project, we did not make a clear direction for our project which lead to the argument in the middle stage of the project. Fortunately, we gathered in time and discuss the methodology to handle the issue patiently. This lesson tells me that we should make full preparation before we start the program. We need to build a frame at first so that we can follow the frame to consummate the details. There are deficiencies in work distributions as well. Due to the inconvenience of sharing the process using app inventor, we cannot share our new functions to each other which caused us do not know what to do. Therefore, some team members did not fully participate since they do not have clear aims of their work. This teaches me that we

need to bond the relationship with team members and increase the opportunities of communication so that we can discuss the solution in time and sharing ideas to prepare for the brainstorm.

Apart from the precious lessons from teamwork, I also gain the ability of collecting information, solving problems and self-study. Although the project workshops have taught me many useful skills to develop apps, there are still some knowledges that cannot gain from class. Therefore, using the internet source is a considerable solution. I also join some online class to gain the inspiration from different people. During this process, I learn how to learn by analogy. I realize that every block can have the corporation. The methodology used for drawing picture can be also used for saving the picture. Additionally, when I encounter the challenges, I will not be at a loss. On the contrast, I will become active to find the resources and solutions from internets and books. The power of an individual is unlimited only if we borrowed the power from the group.

I blindly emphasized the importance of function in the past, now I realize that what determine a good application are not only the comprehensive functions, but also the convenience and practicality for the users. In the future development, I need to put myself in users' shoes to examine the meaning of existence of my project.

To conclude, I have learned to familiarly use the app inventor, to overcome the obstacles with confidence and to work with others with passion. This project is a precious experience, for it not only broadens my horizons but also promotes myself to a new stage.

### **(iii) Member 3: Hong Yuling**

In this project, the function I made is the Gallery. When the user takes a photo and clicks "save" button, this photo will be stored in local album and Gallery. If the user wants to evoke memories about their photos, they can open the Gallery.

In this page, it only can display up to four photos. The latest photos will be shown at the front of the old photos automatically. If Gallery is filled with four photos, the earliest photo will be deleted when the latest one was put in. In addition, the time will be displayed at the top left corner of the screen so that users can remember when those photos were taken. The blocks are as follows.



After saving photos, I use TinyDB to transfer the photos to the screen. There is a problem about the format of the file name. So, I need to delete the previous part which is “[file://](#)” and choose the second part as new file address. Then the photos can be displayed on the screen because of the correct file address. I also use TinyDB to show the time which has been stored in TinyDB. As mentioned before, the old photo will be replaced when the TinyDB detects a new one. TinyDB changes the file address correctly again and transfers the original photo to the second one. It repeats in this way when new photos are taken.

There is also a return key, the users can click “Back to Home” button and the screen will go to the home page. Then the users can take new photos if they want to create a new memoir. The users sometimes may want to change some of the photos in Gallery, they also can back to the home page and retake a new photo. The blocks are shown as below.



I am also responsible for testing the whole application and reporting the errors. We have encountered many problems and we try to solve them together. Moreover, we also modify our project many times because of the limitation. For example, the maximum photo saved only allows four of them. Even though there are many obstacles and strictions, we all try our best to make the project better.

### My reflection

From this group project, I have learnt a lot. Not only did I gain knowledge about computing, but I also learnt how to cooperate with my groupmates. At the beginning of the project, I searched for a lot of information. Our starting point is camera, and it is similar to the general camera function. So, we need to add other functions to make this application special. Then, I searched for what other cameras lack and discussed with my groupmates what we can add. Therefore, there are various functions like Edit, time record and Location. During design, apart from what I learn from lectures, I also search for other learning resources from the

Internet like YouTube or Google. It improves my critical thinking and problem-solving skills. I am also very grateful for my group leader and groupmates. They help me to figure out many ways to solve problems.

#### **(iv) Member 4: Lau Choi Yu Elise**

Start of the app:

During the lesson, after knowing that we have to develop an app, we started thinking about what to do. We would like to make an app that is user-friendly and that everyone would like to use it. Upholding our aim, we think that photo sharing with timeline is an app that can attract people to use. As people like to use their phone to capture their precious moments, it is attractive to people who like to go everywhere and enjoy taking photos. However, one main problem is that people may forget where they have gone and what they have done. After taking those pictures, most people do not look back and it becomes a waste of storage and a loss of memory.

Information research process:

After knowing the aim of our app, we try to research the functions that can be added to our app. We asked people around us and looked at the using habits of many people on social media. As a result, we found out that people who take many photos like to edit their photos and add words or drawings to their picture. Therefore, we added this function to our app and grouped it into the main function. Besides, to enhance the usage of the app, we added the timeline and location function. This can help solve the problem of not looking back at the photos and not remembering where and when they have been. Furthermore, most people use social media nowadays, and the main function of photo sharing is added as an additional function in our app.

Use case diagram:

In this project, the main part I contribute to is the use case diagram. Thinking about the main functions of the app, I developed the case diagram by listing the few functions and the included part. In addition, I added the extra functions in the block and tried to link them together. After linking all the functions, I draw the primary and secondary actors outside the system, which is one main difficulty I have encountered. After finishing the case diagram, I then share the case diagram with my group mates and we modify them so that more detailed functions are added.

Reflections:

After finishing the app, I think that the best thing we have done in this group project is that we have good communication. This is an important skill while doing a group project as good

communication can help increase the efficiency of the group. In our group, we used different communication platforms to connect to each other, despite the circumstance now. This is one of the main ways why we can cooperate effectively.

However, I think that I can work more on the development of the app. My group mates helped me a lot while developing the app, and I learnt a lot on the functions and developments of the app. I hope that after learning the uses, I can have more contributions in other occasions.

Although I did not contribute much to the development of the app, I put more effort on the information research part and the 'use case diagram' part. This gives me an opportunity to be more involved and understand more on the process of this project.

#### **(v) Member 5: Lam Wan Yuet**

### **Individual Report**

#### Overall

During the preparation stage, I proposed the design directions of this program actively. For example, I suggested designing an app for those who take care of the elderly. The app can record the diaper usage rate, wake intake and dosage of the elderly. Analyzing charts and graphs will be generated automatically. It can help caregivers to have a better understanding of the situations of the elderly. In addition, the program will include an emergency location function. However, after considering the feasibility and coverage level, we decided to create another app, Time Memories Imager. Time Memories Imager allows users to take and save photos in real-time. Users can edit the photos, like adding notes, on the user interface and review them in the gallery.

Also, we always exchange our ideas through online discussion platforms, such as Zoom and Whatsapp. Since it is my first time using MIT App Inventor, I am not familiar with its functions. I spent a lot of time exploring the use of it. Also, I created a new MIT App Inventor account for attempting the edition of the built-in blocks. It is because I am afraid that my attempts will bring irreversible effects to the whole program accidentally. I moved the sets of blocks to the group account after ensuring that the app could run the blocks successfully. I have encountered different difficulties during the process, and I am very grateful to David for every help.

#### Contributions

I am responsible for doing information research and designing the sets of blocks to establish the gallery. First, I collected the ideas of the functions of Time Memories Imager from the discussion on Whatsapp. Then, I did some researches on whether the pictures could be realized and asked for suggestions. For example, I tried to figure out how we could use TinyDB to save the addresses of photos and realize the function of displaying them through researches. Apart from the lectures, I have watched different tutorials on YouTube to learn more techniques in developing an app in MIT App Inventor, hoping that its functions could be more diverse and attractive.

Next, we have designed the part of the gallery. For the user interface, there is a maximum of four photos will be displayed in the gallery. The second early photo will replace the storage of the earliest image if the user takes the fifth photo through this

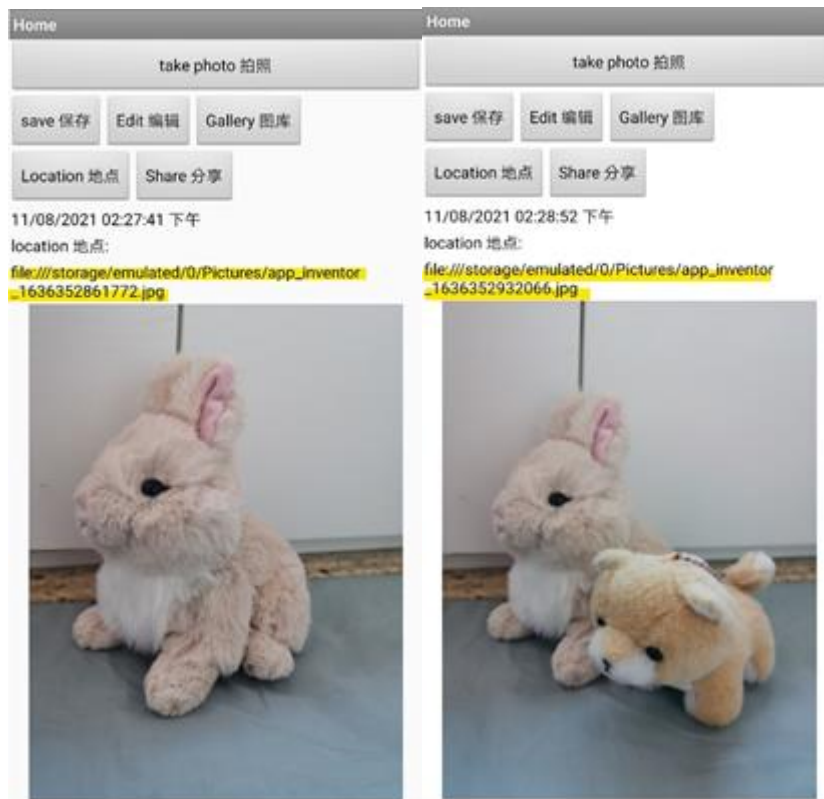
program. The top left-hand corner of the page will show the year of the photographs. It can help the user to recall their memories. Also, the user interface will show the address of the photo after photographing. We also designed the "Back to Home" button to return to the home page.

Furthermore, it takes a lot of time for me to complete the assembly of the blocks. We need to design sets of blocks to call TinyDB three times and attach a tag to each TinyDB. In this way, the photo will occupy the position of the previous one after each time a picture is taken. These procedures form a circulation of saving photos. In addition, I used a block to separate "[file:///](#)" and the address. Therefore, the addresses of the photos can be recognized by the program. Finally, the part of the gallery can function smoothly.

*This is the user interface of the gallery.*



*The text highlighted in yellow colour is the address of the photo.*



*The text highlighted in blue and red is the year the photos and the limitations of the number of photos, respectively. The pink numbers are listed in the order in which the photos were taken. Also, the white numbers represent the positions of the storage of photos.*





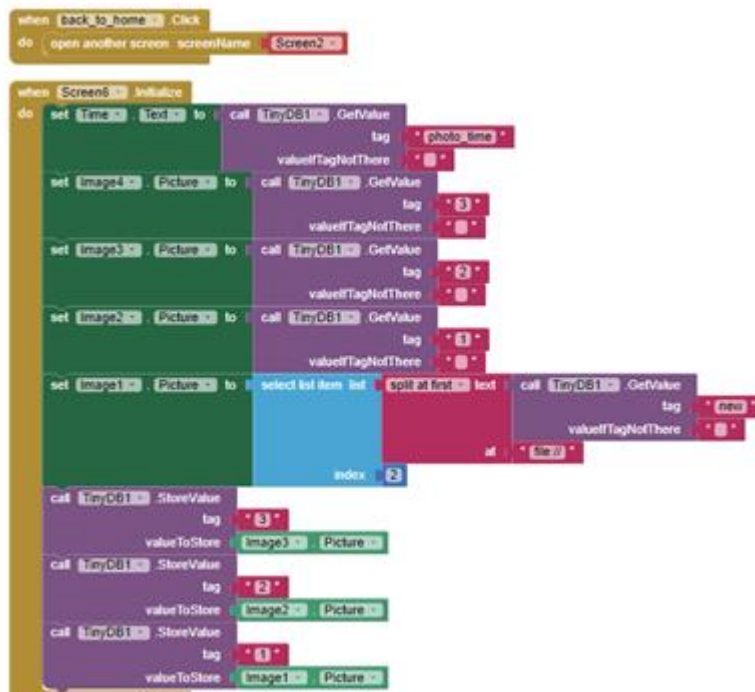
*This is the fifth photo.*



*Then, the photo will occupy the position of the previous one.*



*These are the blocks designed for the operation of the gallery.*



Reflection

It is my first-time attempt to design the sets of blocks in MIT App Inventor. In continuous practice, I am more and more able to grasp the application between blocks, mainly the functions of TinyDB, which is the primary component of the gallery's operation. Although I have encountered many difficulties in this project and felt frustrated sometimes, I realised the importance of practice. Only by attempting and practising can success be possible. I got a great sense of accomplishment after finishing this project. Furthermore, it is riveting. We can develop an app by assembling blocks, and the interface shows the logic clearly. MIT App Inventor is suitable for beginners to get into the field of computing.

Moreover, I learnt that communications between group members are very vital in the accomplishment of this project. We need to communicate with our team members as early as possible if we encounter difficulties that are hard to solve by ourselves. Because we are a team and we need to ensure the project can be completed efficiently and effectively. Although the responsibilities are assigned to different members, we are willing to help each other because we understand teamwork is essential. Also, we can improve our problem-solving skills during the process. For example, we need to identify the problem, analyse it, research it, and solve it using our knowledge and creativity.

Finally, I would like to thank every groupmate for their active participation and the teacher's suggestions at the weekly meeting.

#### **(vi) Member 6: Yang Xiao Lin**

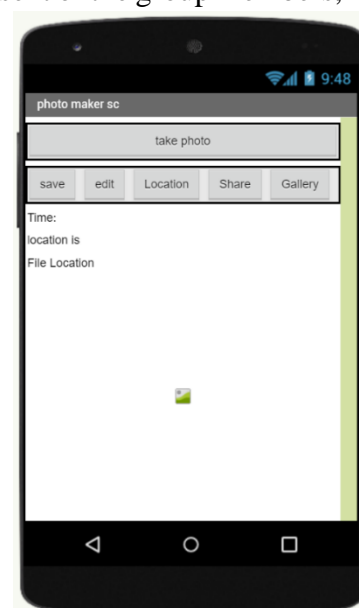
In this project, I was responsible for develop some parts of location recording with sharing function and Use Case Diagram.

After deciding to do a photo memoir, I came up with the idea of sharing. That means user can share photos of the landscape with others, and those who shared them could also know where the landscape was. With the unanimous consent of the group members, I started working on it.

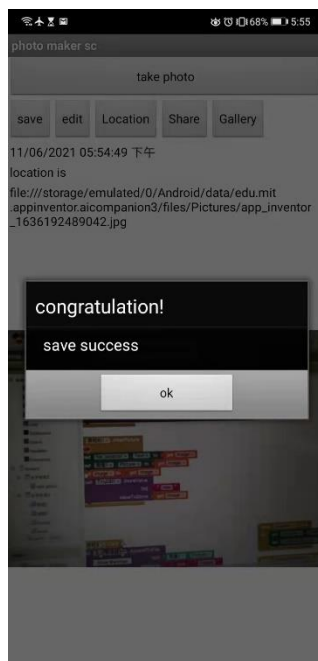
In order to let new users know about this feature, I placed the 'Share' button under the 'take photo' button on the Screen 2, as the photo on the right, so that users can clearly know the function of sharing after taking a photo.

After users click "take photo", The interface will be connected to the camera of the system.

After the user takes a photo and save success, click "Share"



and the following screen will appear.

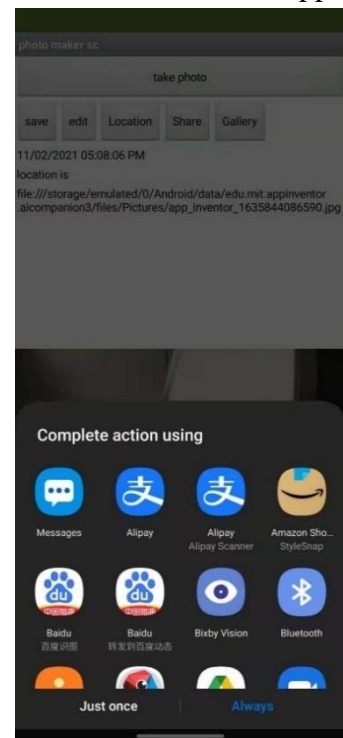


Users can share to other platforms on mobile apps immediately, include Bluetooth, google

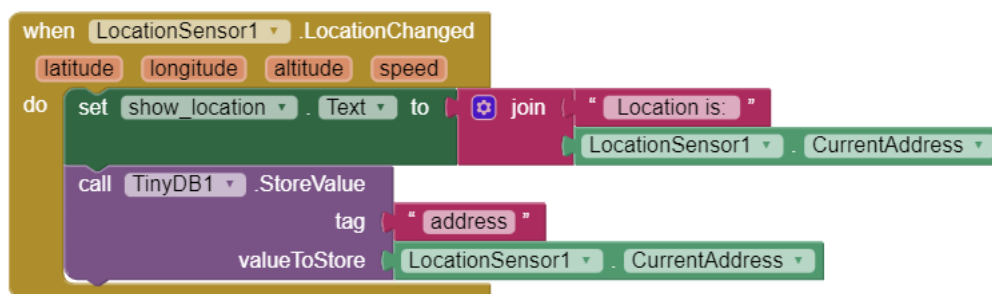
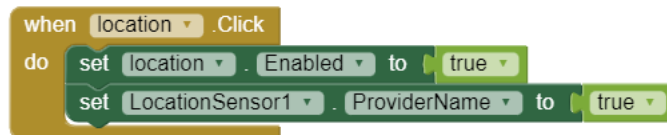
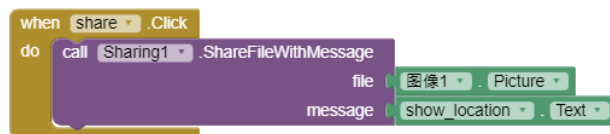
drive, zoom and so on.

In the interface of sharing, users can input the location of taking the photo by themselves.

After clicking "confirm", the photo and location will be shared to other platform and person that the user wants to send to through this mobile app.



Below is the code blocks :



For users of different languages, I added Chinese and English language support, so that more users can easily use this app.



### My reflection

As a person with little knowledge of ICT, I never failed to learn during the process of developing this program.

At the first group meeting we all presented our expectations and suggestions for the program and tried to add innovative elements. To make the app unique in the marketing, we combined photos with time and place.

I encountered logical difficulties in the location section I was in charge of. After searching online for solutions and teaching videos, I sent the questions to the group and asked the other team members for help. After their advice and instruction, I also successfully completed my own small task and made my own contribution to the project. When other members of the group have difficulties, we will discuss together and decide the best solution. This atmosphere of mutual learning and mutual progress is perhaps the greatest benefit of group work.

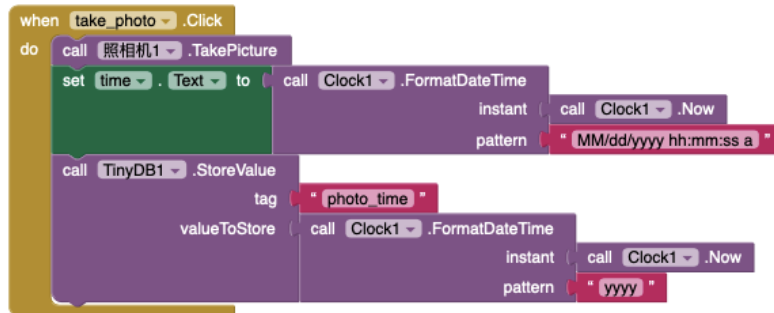
Although my contribution may be insignificant compared with that of the team leader and other team members, this project gave me a new experience and learning process. I not only gained more knowledge of creating applications and improved my self-study ability, but also developed innovative thinking and broke through myself. Most importantly, I gained the friendship of working together. Thanks to the group leader for his planned leadership and other group members for their encouragement and support. It will be a valuable learning experience for me.

### (vii) Member 7: Lam Ho Yan

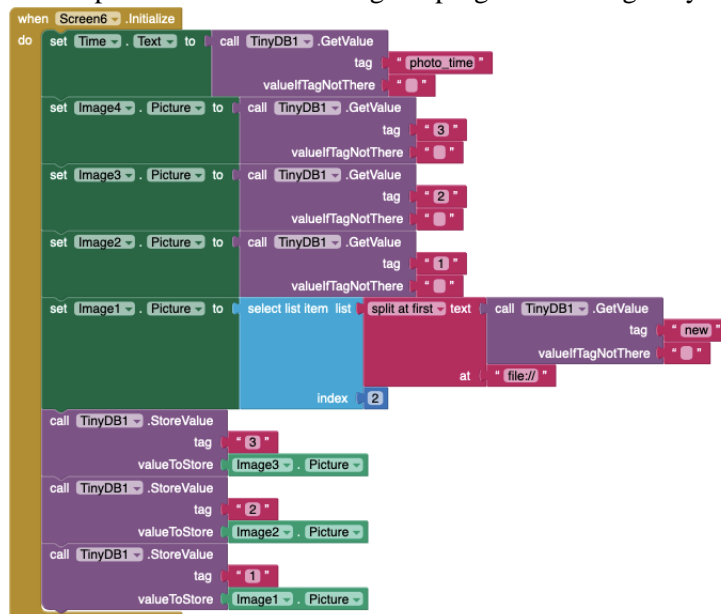
I was responsible for the storage, formatting the application and display ideally, and researching the clock and location information in this project.

For storage, a TinyDB was built up to store the pictures taken by the mobile phone.

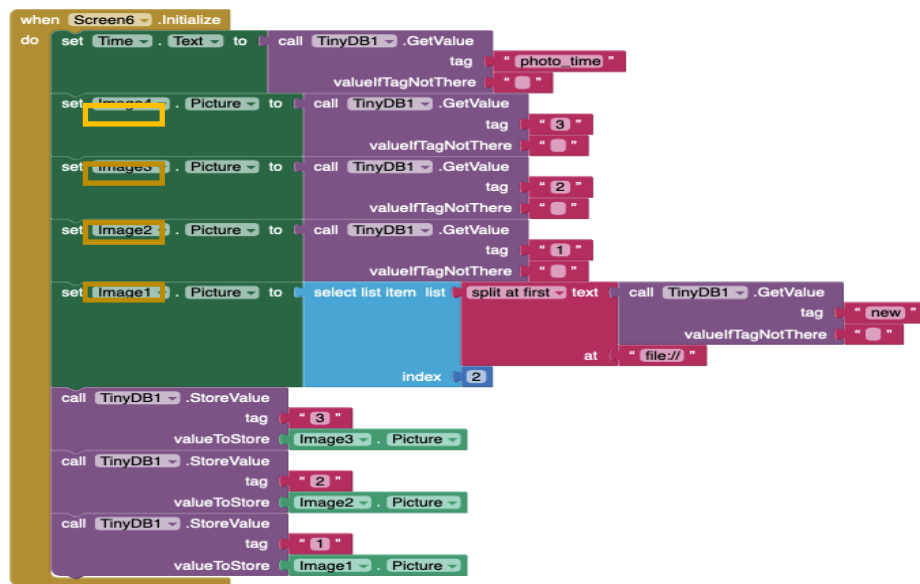
To display the photos in the app, TinyDB is needed to access the photos taken by the user. When the user takes a picture, it will eventually store in local. TinyDB will call back the photo file kept in local and get the image to show on the screen.



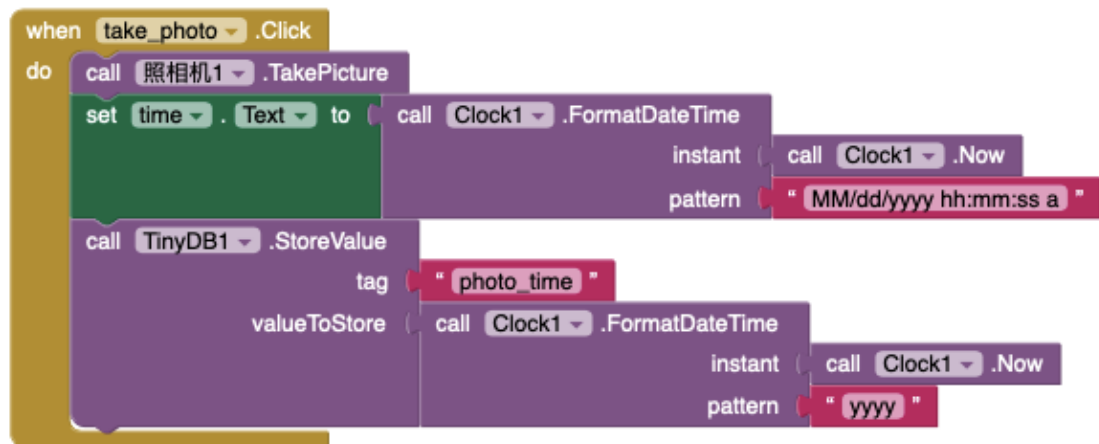
This is part of the code showing the progress of using TinyDB to call back the photo file.



Other than the storage part of the app, I have also done the role of formatting and application to let the app display to users perfectly. My groupmates could easily find the usage and function of the code after I reformatted the application. The code is more straightforward and neat with the changes of name. The fluency and efficiency of teamwork were thus enhanced.



I renamed the images and gave numbers to them.



I have given the name 'clock1' to the clock button.

These are examples of the changes in the name of code done by me.

Besides, I did formatting in this app. SimpleDateFormat is used to formatting and get the time information from local. The letter 'y', 'M', 'd' are used to present 'year', 'Month in year' and 'Day in month' respectively. The sample is shown above.

Something about the APP:

The tentative idea of Time Memories Imagers is to make a photo gallery with a function that can save some detailed information. For instance, the time and the date will show next to the taken photo. The aim of creating this APP is to provide a place for people to store their memories. Time Memories Imagers also act as a diary that users can write down their own stories by taking pictures. This APP may become a

new trend of writing a journal as we can use our phone to take a shot anytime. It is convenient and efficient. A timeline that a photo can place in the sequence was proposed in the beginning. However, due to some limitations, this timeline is unable to achieve in this project. So we have more discussion for the function design of the app. After a few time of editions, Time Memories Imagers becomes the final version.

My reflection:

This is my first experience developing a mobile app. It is a wonderful experience that we create an app from ideation to an actual functioning app. Our teams have faced many difficulties and challenges in this project. But we solve all problems under our collaboration.

I have learned quite a lot from this project. To start with, the experience of developing a mobile app would be the most significant benefit. The progress from deciding the type and topic of the app to the time we start to code in MIT app inventor gives me a taste of being an app inventor. Although I did not have any computer background, I am willing to get in touch with new things. I also enjoy participating in the discussion in the group. All the group members were trying to give their suggestions and idea to make this project being perfect. My communication skill thus enhanced with this group project.

Next, my self-learning ability is also improved after this project. App inventing is a new experience to me. I do not have enough knowledge to support me in finishing my part of the work. I need to seek help from my group members or search for the necessary information online. The skill of searching for helpful information has been a lot better now.

This project was an eye-opening experience for me. My communication skills, self-learning skills and interest in app inventing all enhanced in the project.