Modern Topics in IT

Assignment 3

Batch: IT -

Weekend **4th**

Year – 1st

Semester 2021-

Aprill - 24

Declaration:

We hold a copy of this assignment that we can produce if the original is lost or damaged.

We hereby certify that no part of this assignment has been copied from any other group's work or from any other source. No part of this assignment has been written / produced for our group by another person except where such collaboration has been authorized by the subject lecturer/tutor concerned.

Group Members:

IT18153750	Herath H.M.R.K.R.
IT18378658	Perera A.P.A.D.
IT18107210	D.P. Seekkubadu
IT18147988	Suraweera R.R.

Introduction

In software development circles, augmented reality (AR) is an intriguing topic that helps to step into the future of technological developments. This is a technology that works on computer vision-based recognition algorithms to augment sound, video, graphics and other sensor based on inputs on real world objects using the camera of the user's device. This helps to render the real-world information and present them in an interactive way so that virtual elements become one with your own surroundings.

This technology captures the image of a real world object, and the underlying platform where this AR technology runs detects a marker, which triggers it to add a virtual object on top of the real world image and displays on the camera screen.

There are many real world uses for this AR technology such as in the education industry, advertising industries, traveling industries, to develop translation and location based apps and in gaming industries. In this article we are focusing on an app that is simmilar to the picitionary game that is played by students within the age group 8-12. This helps to develop both cognetive and non-cognetive skills in the user. To deveop this we mainly focused on marker based AR technology.

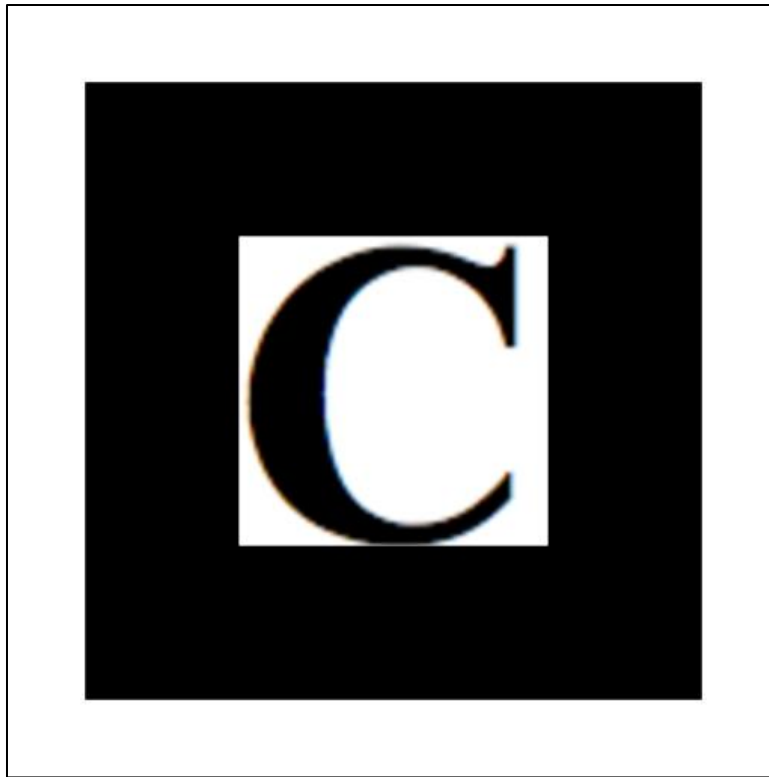## 1. IT18153750 - Herath H.M.R.K.R.
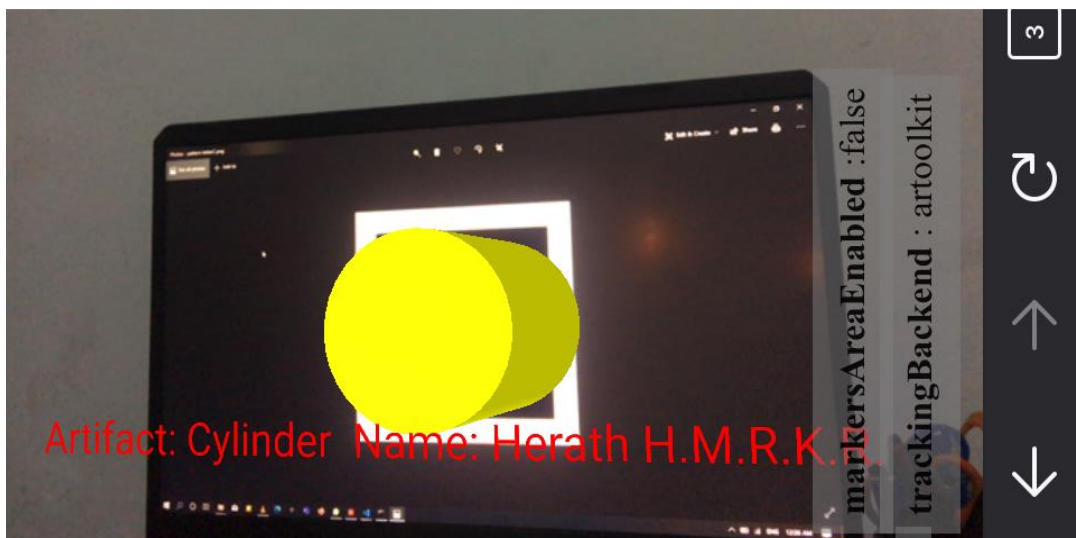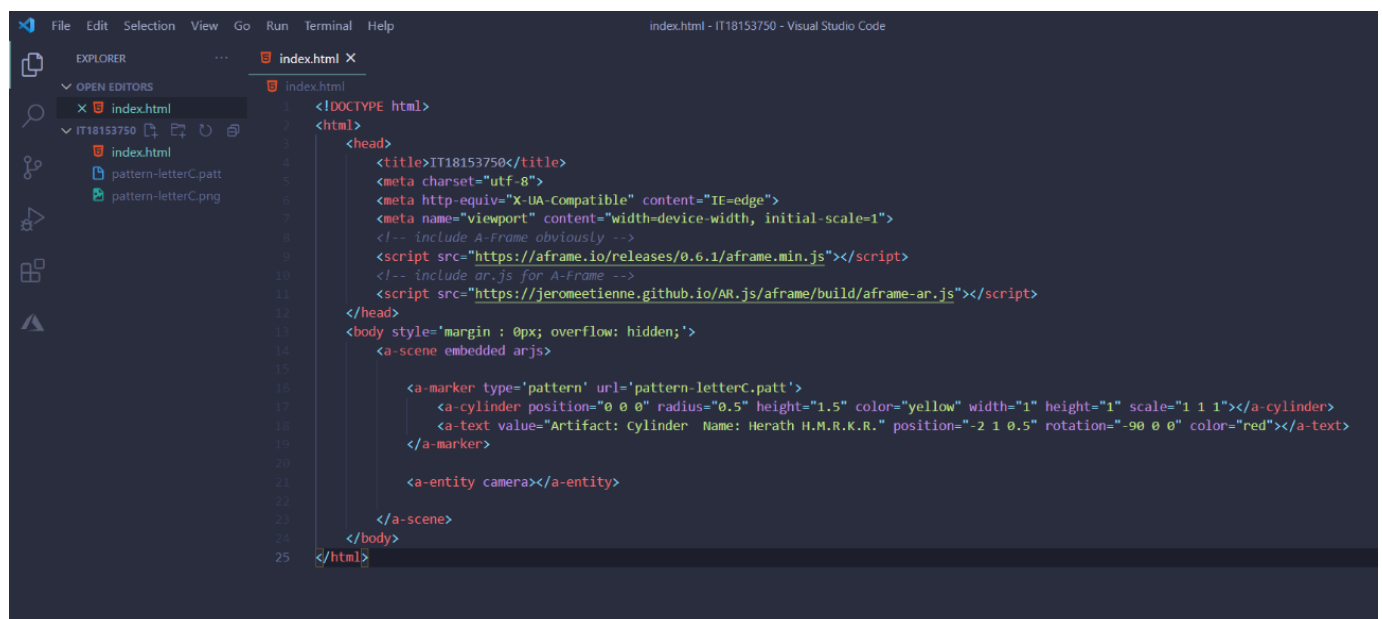

Figure 1.1 – Marker 'C'

Figure 1.2 – Cylinder Artifact

As shown in figure 1.1 I use 'C' marker to show the cylinder artifact using augmented reality. In here I had to use 'pattern-letterC.patt' file to initialize my marker image. This file contains the encoded marker that I reused in the code. For this process I used online marker generator tool: Marker Generator.

To make the cylinder artifact I used <a-cylinder> tag that enables me to show a cylinder in augmented reality that is shown in figure 1.2. Within that tag I used position to determine the exact location of the artifact in the AR environment. Also, with radius and scale I was able to determine the exact size of the artifact. To show the name below in a text form I used <a-text>.

In the figure 1.3, you can see that how I have used URL (location of the patt file) within the <a-marker> tag to link marker pattern with the index.html file.

Figure 1.3 – Cylinder Artifact Code Segmentation

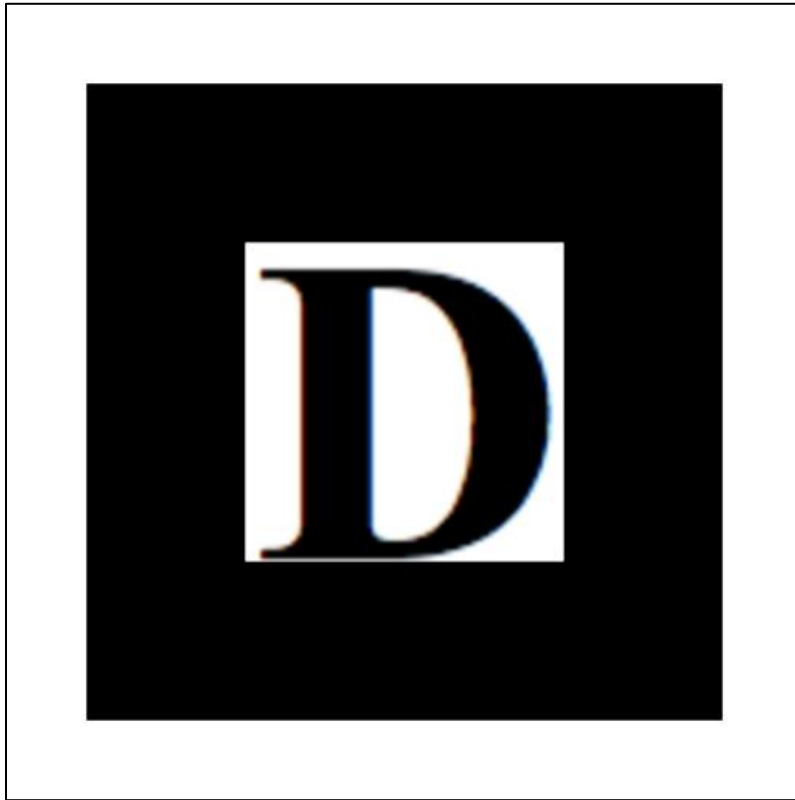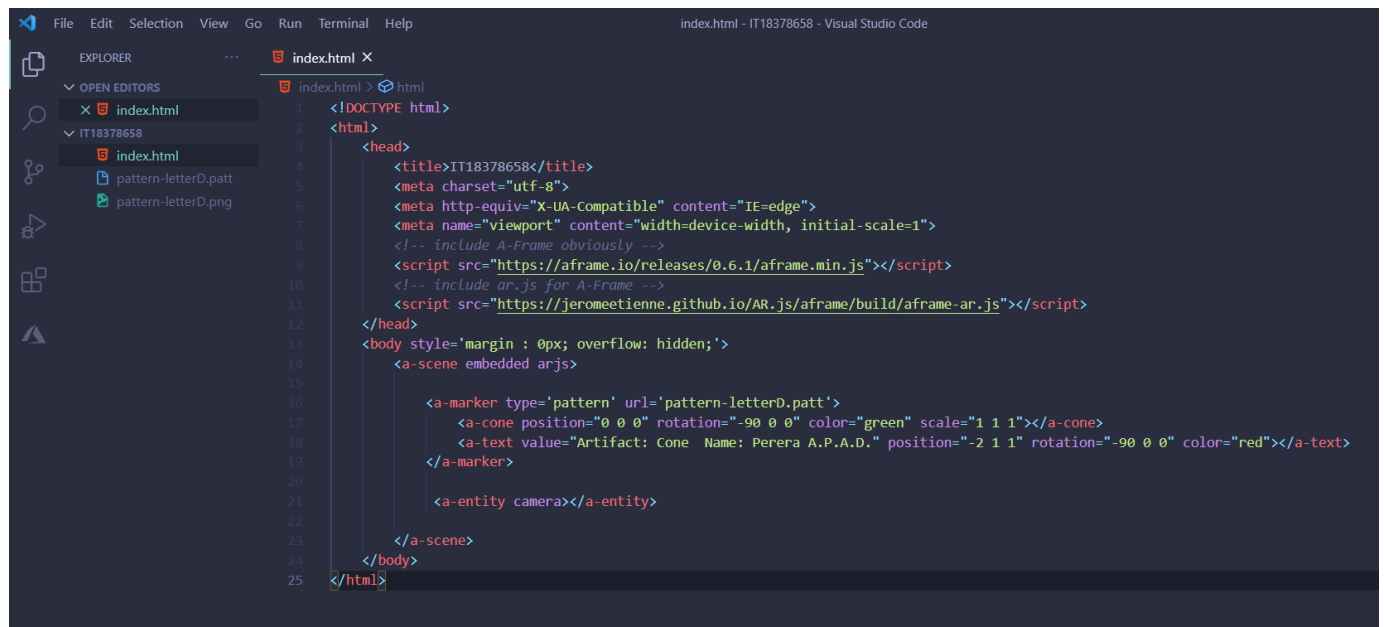## 2. IT18378658 - Perera A.P.A.D.

Figure 2.1 – Marker 'D'

Figure 2.2 – Artifact Cone

As shown in figure 2.1 I use 'D' marker to show the cone artifact using augmented reality. In here I had to use 'pattern-letterD.patt' file to initialize my marker image. This file contains the encoded marker that I reused in the code. For this process I used online marker generator tool: Marker Generator.

To make the cone artifact I used <a-cone> tag that enables me to show a cone in augmented reality that is shown in figure 2.2. Within that tag I used position to determine the exact location of the artifact in the AR environment. Also, with scale I was able to determine the exact size of the artifact. To show the name below in a text form I used <a-text>.

In the figure 2.3, you can see that how I have used URL (location of the patt file) within the <a-marker> tag to link marker pattern with the index.html file.

Figure 2.3 – Cone Artifact Code Segmentation
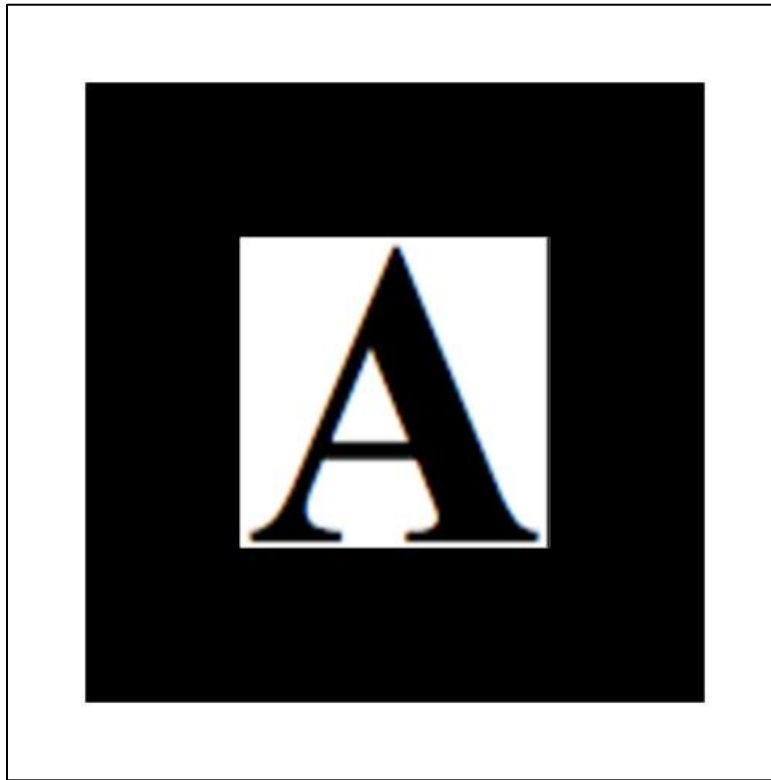
3. IT18107210 - D.P. Seekkubadu
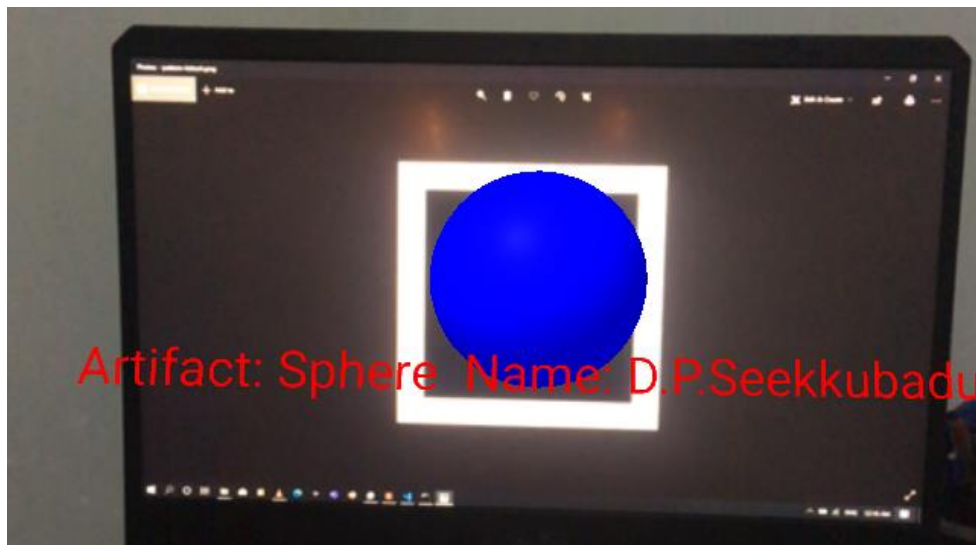

Figure 3.1 – Marker 'A'

Figure 3.2 – Artifact Sphere

As shown in figure 3.1 I use 'A' marker to show the sphere artifact using augmented reality. In here I had to use 'pattern-letterA.patt' file to initialize my marker image. This file contains the encoded marker that I reused in the code. For this process I used online marker generator tool: Marker Generator.

To make the sphere artifact I used <a-sphere> tag that enables me to show a sphere in augmented reality that is shown in figure 3.2. Within that tag I used position to determine the exact location of the artifact in the AR environment. Also, with radius and scale I was able to determine the exact size of the artifact. To show the name below in a text form I used <a-text>.

In the figure 3.3, you can see that how I have used URL (location of the patt file) within the <a-marker> tag to link marker pattern with the index.html file.

Figure 3.3 – Sphere Artifact Code Segmentation
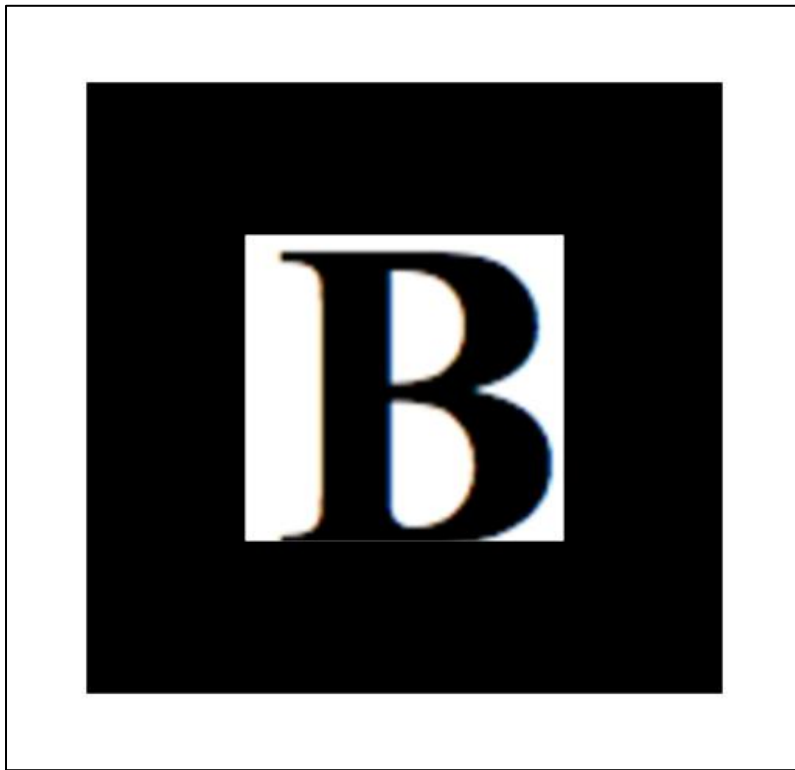
4. IT18147988 - Suraweera R.R.
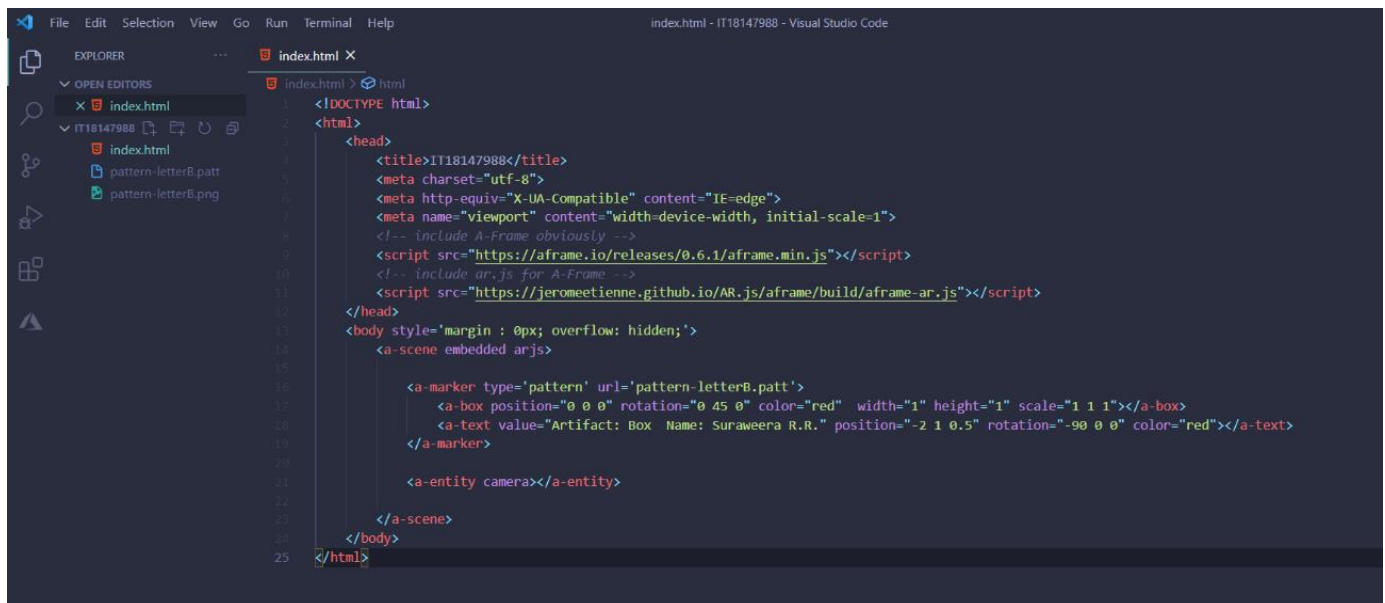

Figure 4.1 – Marker 'B'

Figure 4.2 – Artifact Box

As shown in figure 4.1 I use 'B' marker to show the box artifact using augmented reality. In here I had to use 'pattern-letterB.patt' file to initialize my marker image. This file contains the encoded marker that I reused in the code. For this process I used online marker generator tool: Marker Generator.

To make the box artifact I used <a-box> tag that enables me to show a box in augmented reality that is shown in figure 4.2. Within that tag I used position to determine the exact location of the artifact in the AR environment. Also, with scale I was able to determine the exact size of the artifact. To show the name below in a text form I used <a-text>.

In the figure 4.3, you can see that how I have used URL (location of the patt file) within the <a-marker> tag to link marker pattern with the index.html file.

Figure 4.3 – Box Artifact Code Segmentation
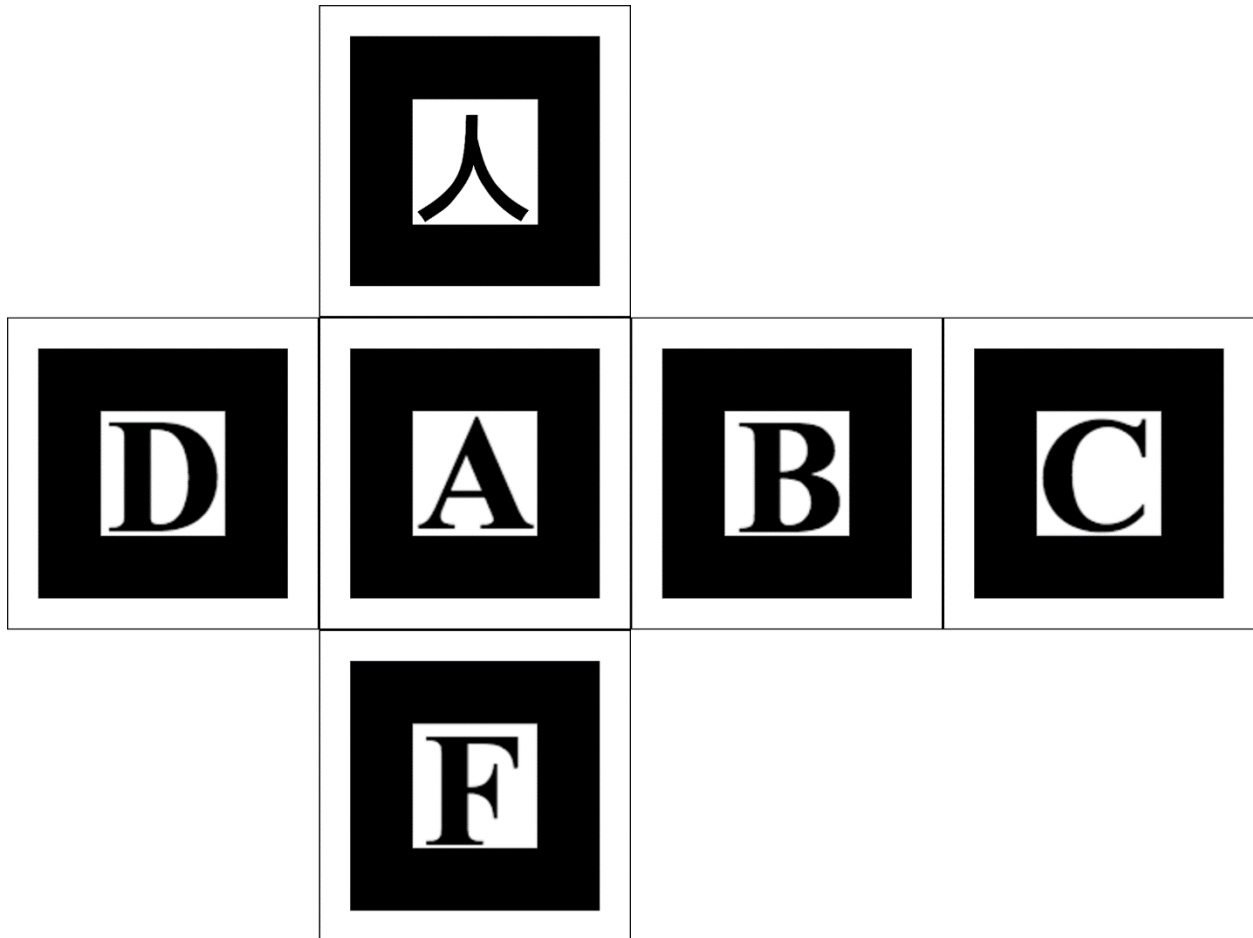
5. Final Product

Figure 5.1 - Marker 'marker-colage'

When making a Pictionary app in AR first I had to make our own marker that contains multiple markers as a one image. As shown in the figure 5.1 markers 'D','A','B' and 'C' are gathered from the work in the individual sections. The 'kanji' and 'F' letter markers are newly added.

In here from 'kanji' marker it shows an object that has a collection of shapes such as box, sphere and a cylinder. It also shows a text indicating a question to the user that to choose the shapes that the object is consist with. In the marker 'F' it shows an image that indicating the app name 'Pictionary'. This is shown in the below figure 5.2.
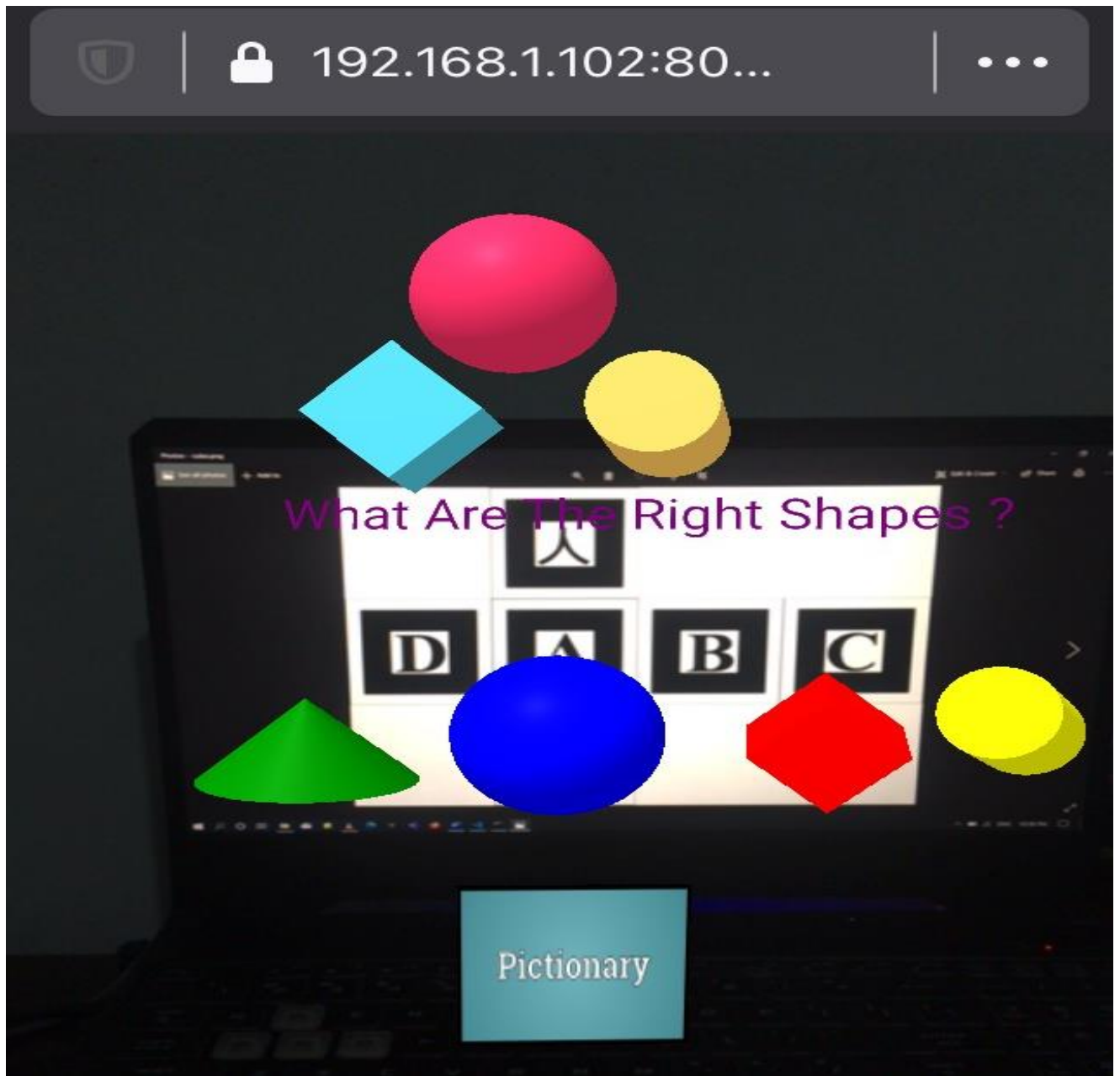
Figure 5.2 – Final Product in AR

Figure 5.3 – Final Product Code

6. Real Life Problem

Speaking of the past and present, the technological advancement in the world over the past century has been rapid and today the technology has reached its peak. There is a lot to talk about in the field of education and its use of technology.

Many students today study only on the theory of the subject. They do not have the space to learn about the practicality of the subject. Here students do not need any practical knowledge during the learning period. However, the main problem that students face after completing their education and going to work is that they have no practical knowledge of the field in which they were educated. Here they get in big trouble.

The following are the problems in the field of modern education.

1. Education is based on teachers.

Here, in the teaching done by every teacher, if all the students who are learning are not able to understand the subject as taught by the teacher, then if they continue to teach in that way, the students will not learn anything. It is also impossible to pay attention to every student here. So the solution to this is to focus on creating a reality that students can see on the subject individually.

2. It lacks visuals

Research has shown that visual processing is 60,000 times faster than text processing.
So the human brain is set up to process every piece of information visually, and why force students to read everything?

3. Education misses the experience.

The experience factor is almost completely omitted from current education. Even so, owning one is still beyond the reach of the average student. Experienced learning helps students adjust their weak learning parts correctly. But this method has been largely avoided by the modern education system.

4. It is Uninspiring

The problem with current education is that teachers are still teaching, using old methods. They still do all the teaching orally. As a solution to this they are able to do the relevant teaching using visual media. But the problem is that it doesn't happen...

7. Solution Using AR Technology

A 2010 study confirmed that students who learned using reality-based mouse and keyboard-based learning performed significantly better academic performance than students who were educated using traditional methods.
It is essential to learn the concept of reality that comes here before finding information on how the modern education system can benefit from it.

Below is how reality can help teachers and students in their teaching.

Figure 7.1 – AR in the field of Education

1. It comes from visuals.

It first focuses on how visually enhances the speed of learning and visually helps students better understand the concepts of learning.

2. It does away with uninspiring leaning

Learning another language can be very difficult and can also be difficult when studying through traditional methods. The present reality is a very unattractive teaching process. There are no more lectures and boring teachings here and learning can be done through animation.

3. It provides experiential learning

Experiential learning is the process of improving students' level of education through the experience of becoming an outsider. Here students can get an experienced education through AR technology. They are able to collide with the tasks in that virtual environment in the environment in which the learning process takes place. This shows a great tendency to develop their practical abilities. It Lets Students Learn Their Way.