Cloud computing services II

Cloud Based Attendance System

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Introduction

In every educational institution, the attendance of students is considered as an important factor for both the student and the teacher. The consistent absence of a student increases the risk of failure. Checking an attendance is the most effective way to improve a student’s attendance rate in a class.

There are two kinds of attendance checking system an institute can choose from:

- Traditionally, the manual attendance system
- Automated attendance system

Most of the educational Institutions use the manual attendance checking system. This current method of checking students' attendance by calling names or passing around a sign-in sheet emerges these following difficulties:

- Taking too much time.
- Requires a lot of effort especially for large classes.
- Affects negatively on both teacher and student's concentration.
- Might cause incomplete or incorrect attendance checking.
- It is open to easy fraud.
- Damage or loss of the attendance-checking sheet.

In order to solve all these problems, different types of automated attendance systems have been developed using different technologies such as using fingerprints, Internet of things, RFID-based attendance system or QR codes. Nowadays, face recognition based automated attendance systems are getting more popularity.

In this documentation, I proposed face recognition based cloud attendance system that can identify students and store their face images into Azure Blob Storage. Azure Blob storage is Microsoft's object storage solution for the cloud. Blob storage is optimized for storing massive amounts of unstructured data.

The main working principle of the proposed project is that video captured data is converting into images in order to detect and recognize the faces and the collected images will be storing in azure blob storage. Later, the system marks attendance with the student's recognized image; otherwise, the system marks the student's attendance to the database as absent.

Used tools and technologies

TECHNOLOGIES:

- Python
- Keras
- TensorFlow
- OpenCV
- Django
- NumPy
- SciPy
- Azure

PLATFORMS:

- Windows/Linux

SOFTWARE REQUIREMENTS:

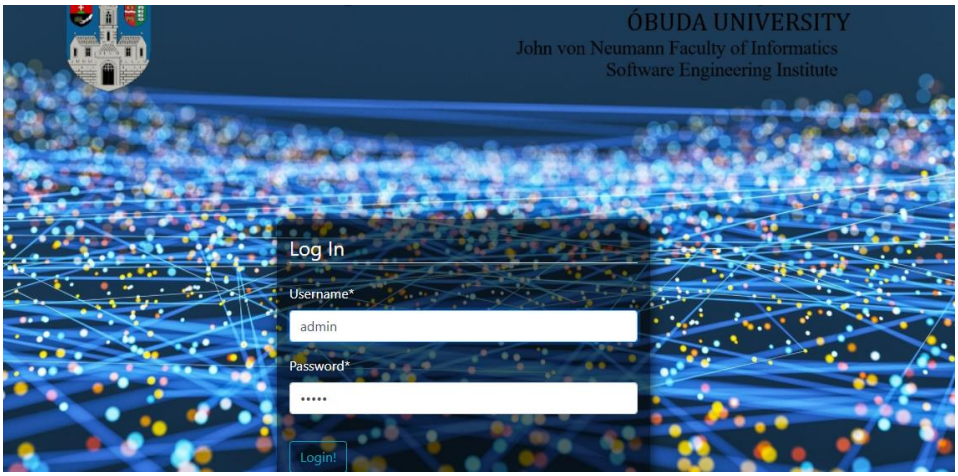
- Windows 10 or above
- Visual Studio Code / Jupyter / PyCharm
- Azure Cloud

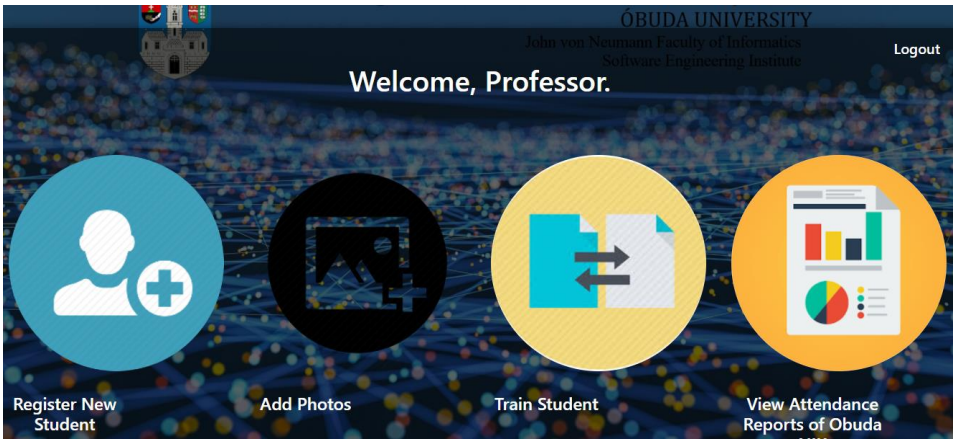
HARDWARE COMPONENTS:

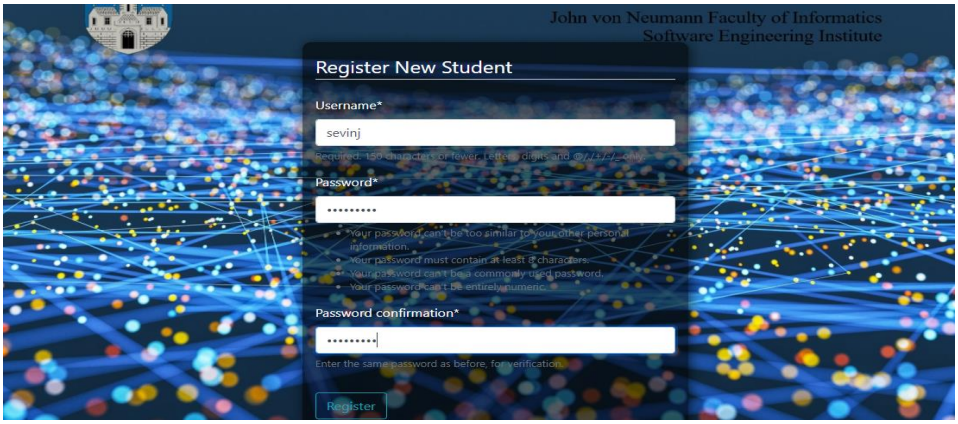
- Processor Intel(R) Core(TM) i5-7200U CPU @ 2.50GHz 2.70 GHz
- Installed RAM 12.0 GB
- Device ID E13E2BA5-B8E5-491E-BE9C-F1F770DF856D
- System type 64-bit operating system, x64-based processor

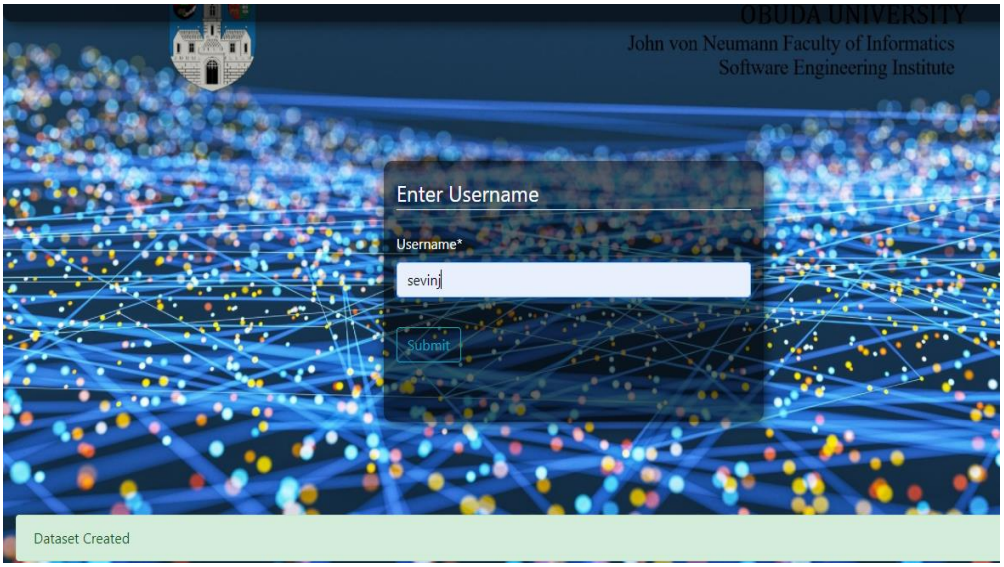
Implementation

First, the admin of the system; a teacher can add new student by registering the new student, filling up their registration details and collect their face data.





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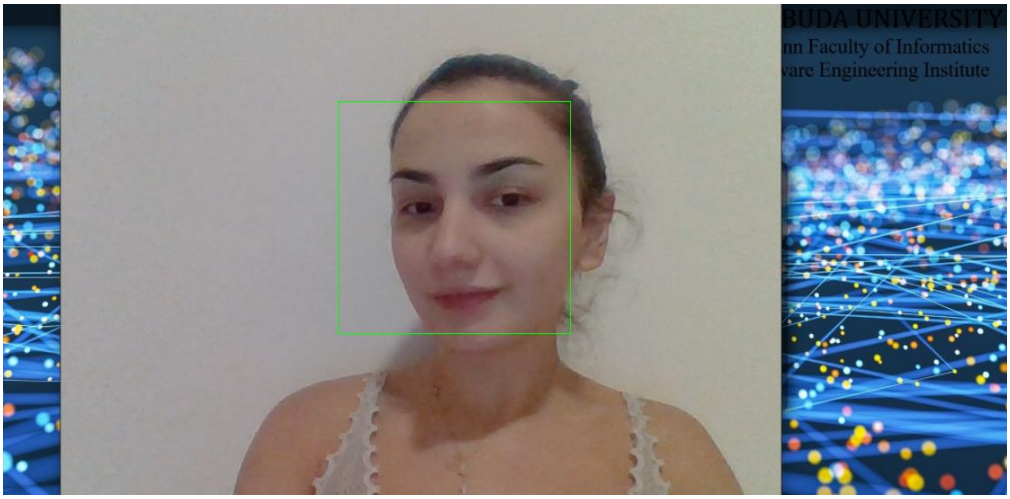
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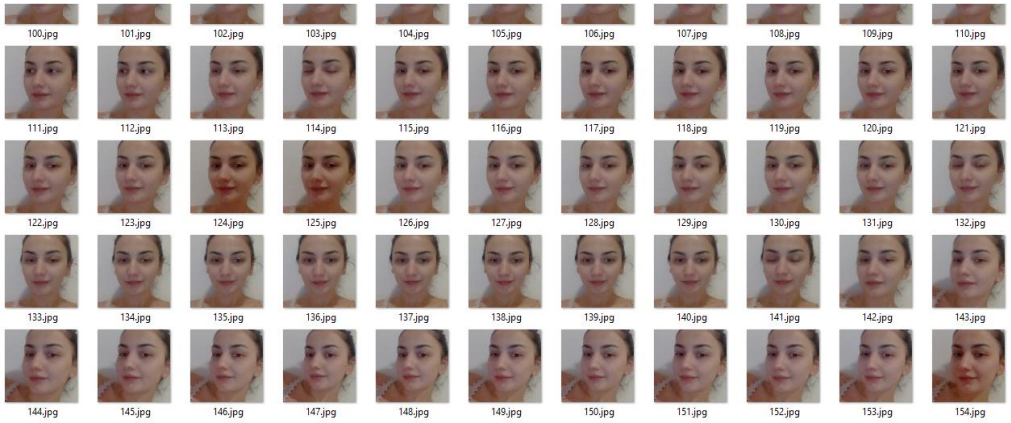
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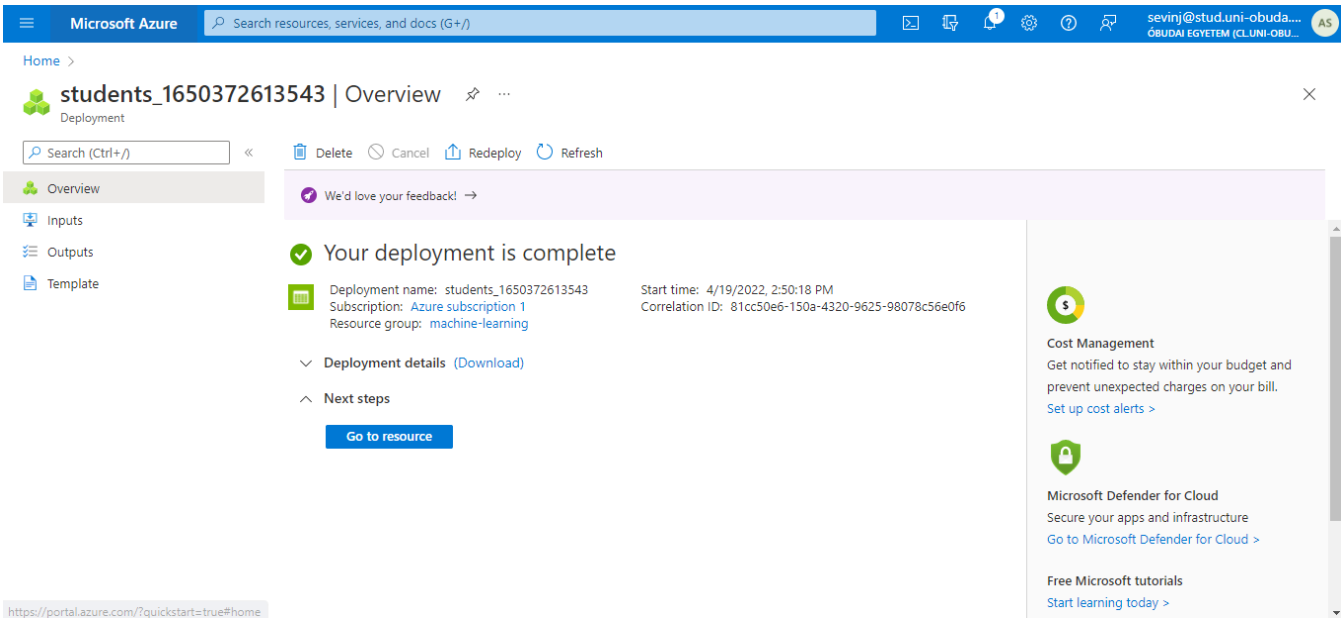
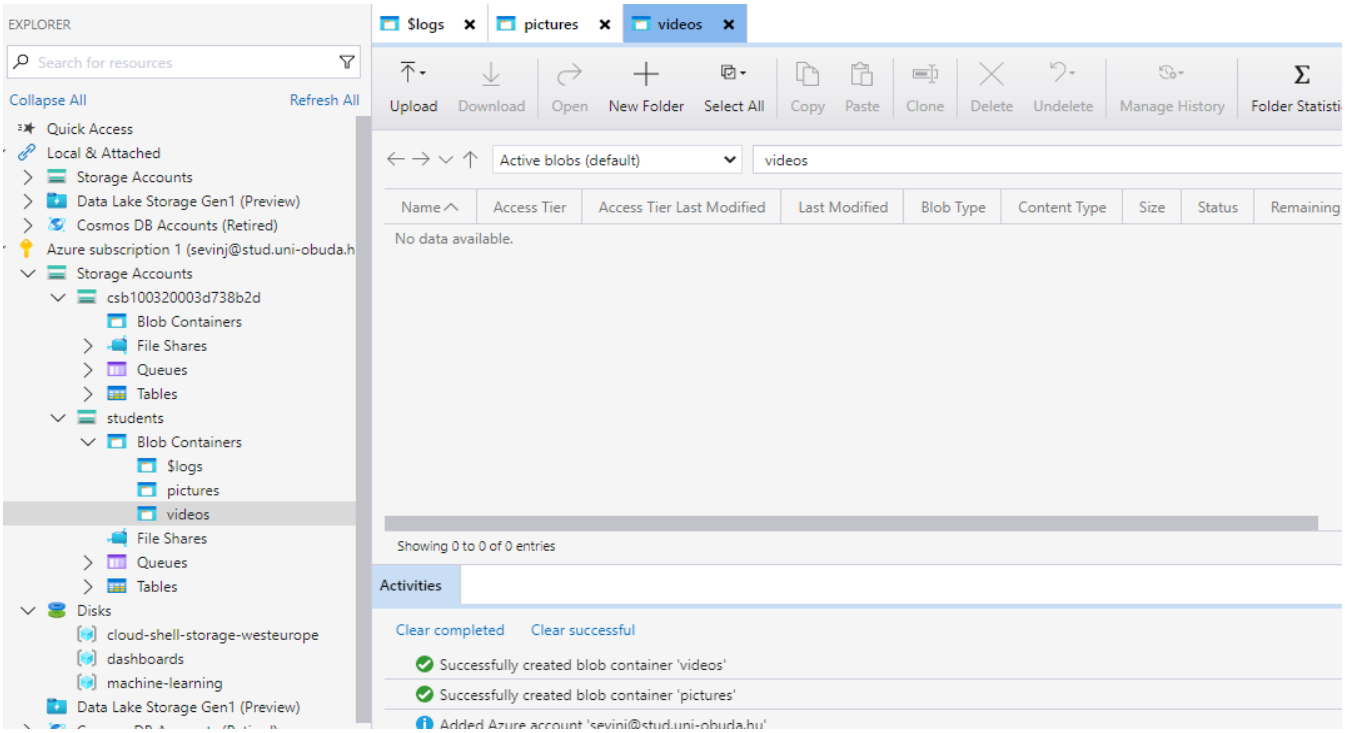
As face images has been collected, the student's face images will be stored into the azure blob.

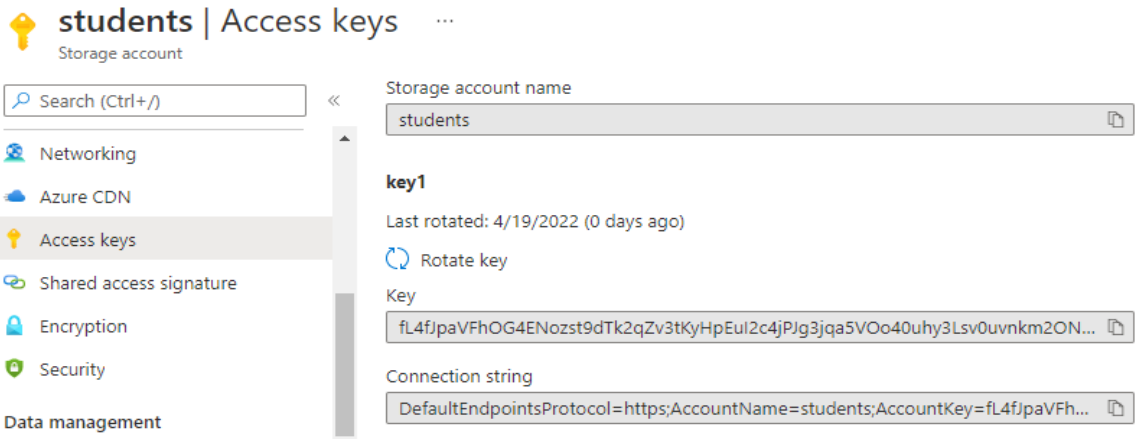
1. The first step in using Azure Storage is to create a storage account.

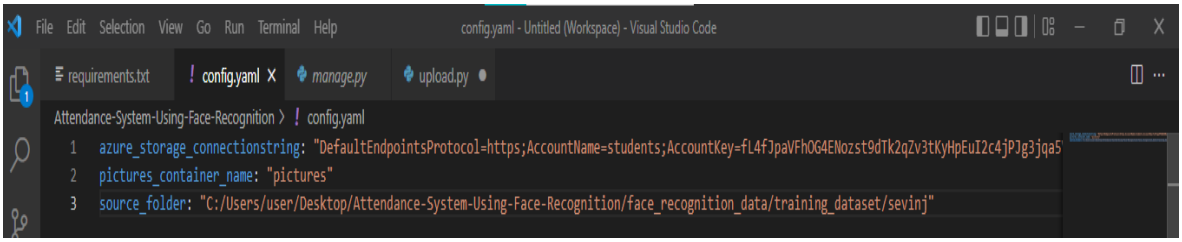


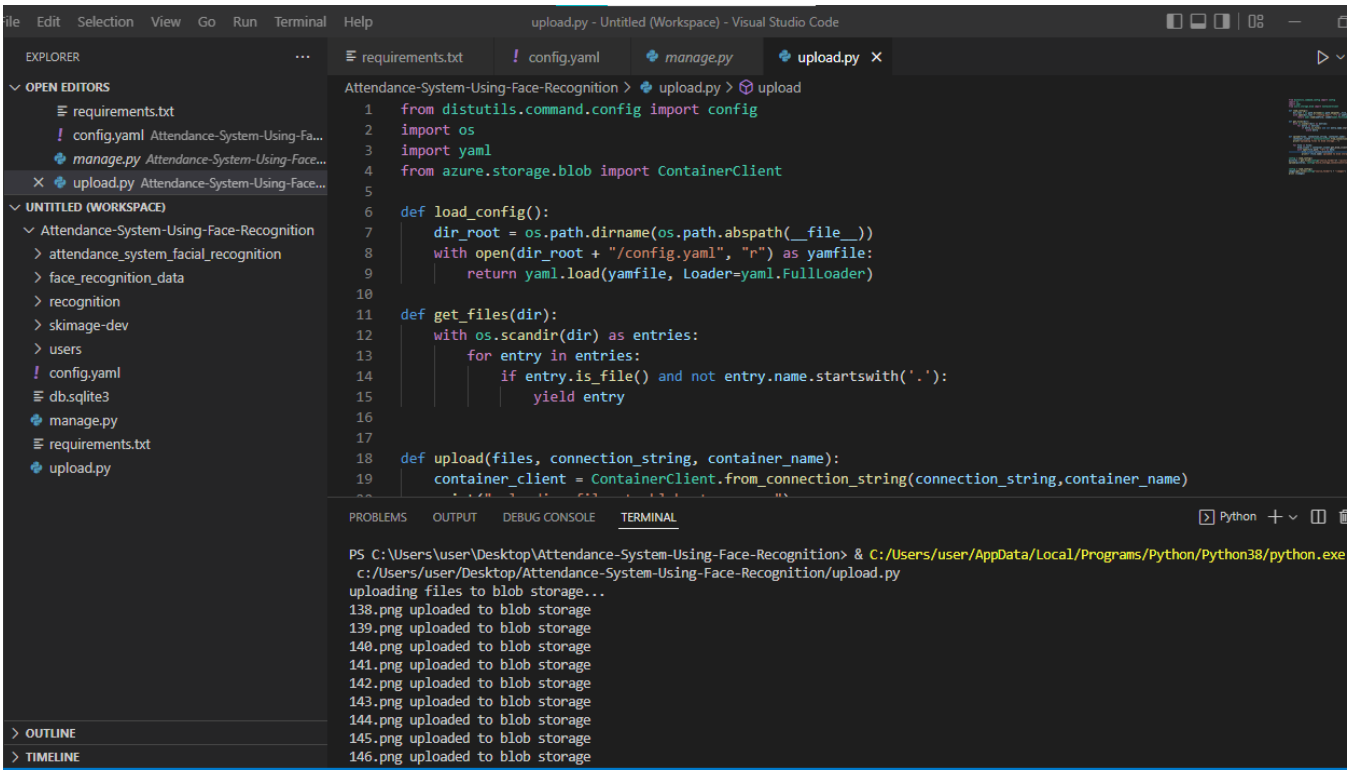
2. Before we create a blob, we must create a container to store it in.



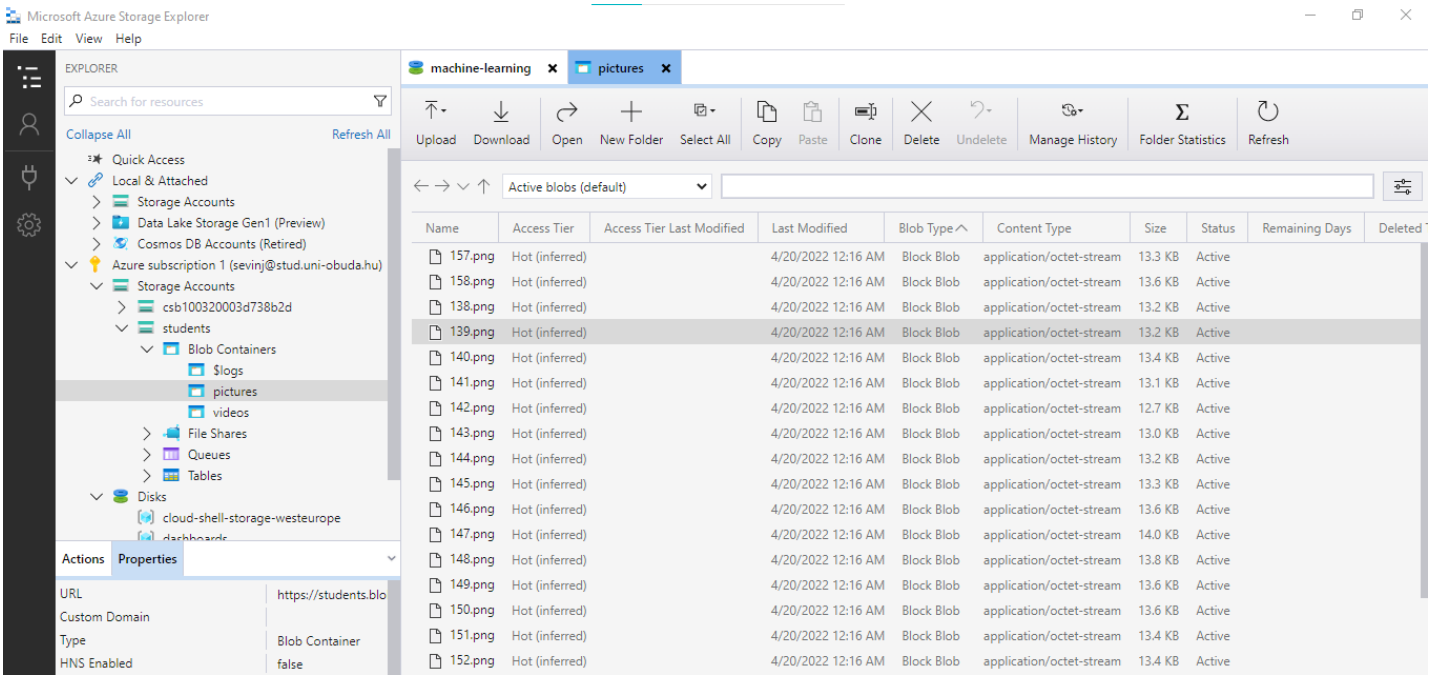
3. And we can finally Upload Collected Images to Azure Blob Storage



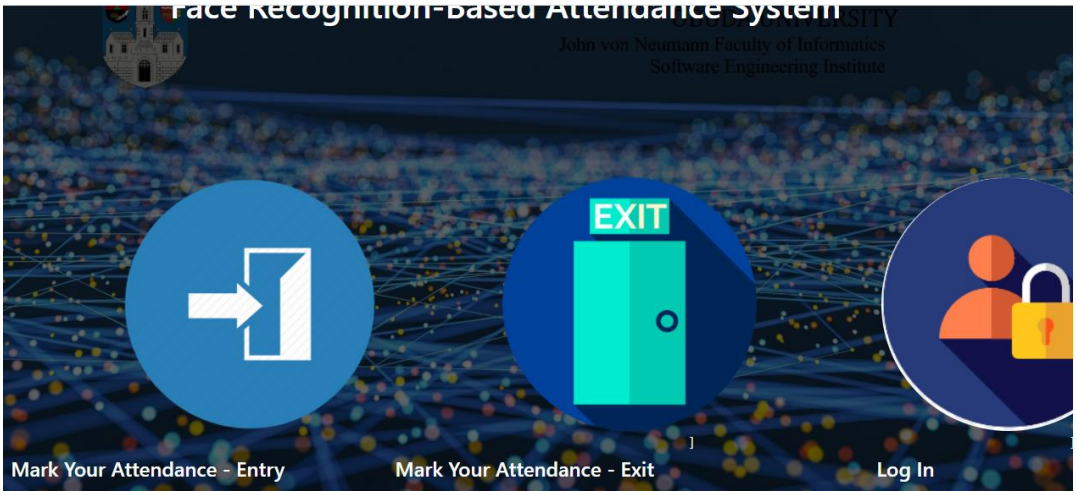




4. Now we can return to the Microsoft Azure Storage Explorer, click the “pictures" container under the storage account we created and see the uploaded pictures here. We can also download the blobs and see the pictures stored in the blob.



Later, the student has to login and record their faces to mark their attendance. The admin is authorized to view the records of all the students. This system allows to keep up to date record of the students.



Conclusion

- **Advantages:**

  - The database is secured as it is stored in an Azure BLOB storage.
  - You can add/remove/change data transactionally.
  - Backups encompass the whole dataset, including the BLOBs.

- **Disadvantages:**

  - Needs active internet connection.

When we are finished using the site, we should delete the resource group containing it. Deleting the resource group deletes all of the resources inside it including the storage account, the blobs uploaded to it, and the App Service, removes all traces of this lab from our account, and prevents any further charges from being incurred for it.