

CSCI4180 Tutorial-9: Assignment 3 Review (Part-2)

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Content

- Azure for Students
- Azure Blob Storage Service
- VM time sync
- Java APIs for Azure Storage

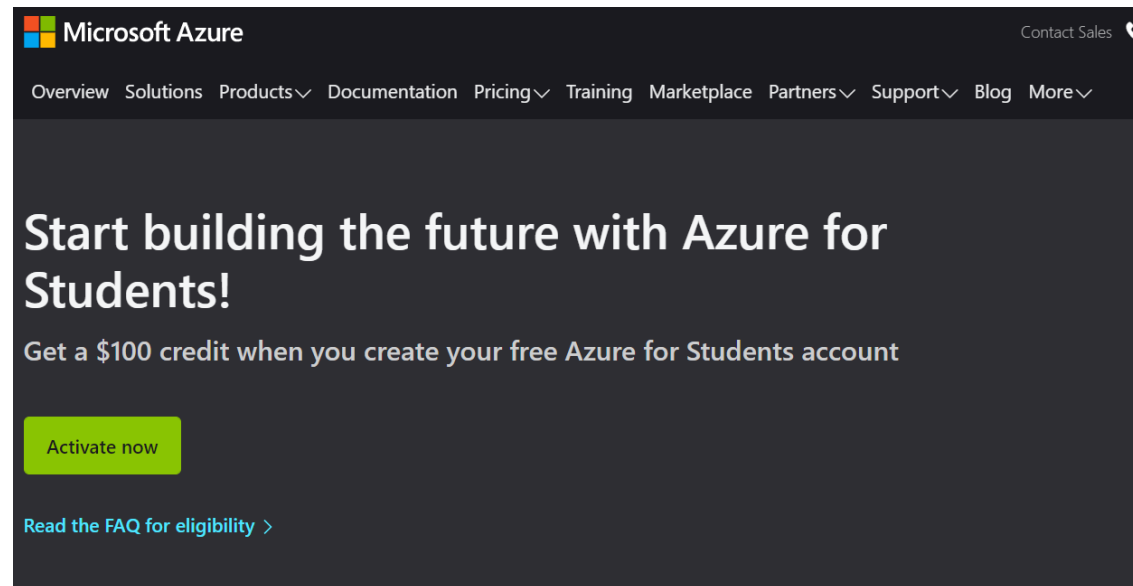
Azure for Students

➤ What is Azure for students?

- Start with **\$100** in Azure credits
- The first 12 months
- Without requiring a credit card

➤ Register link

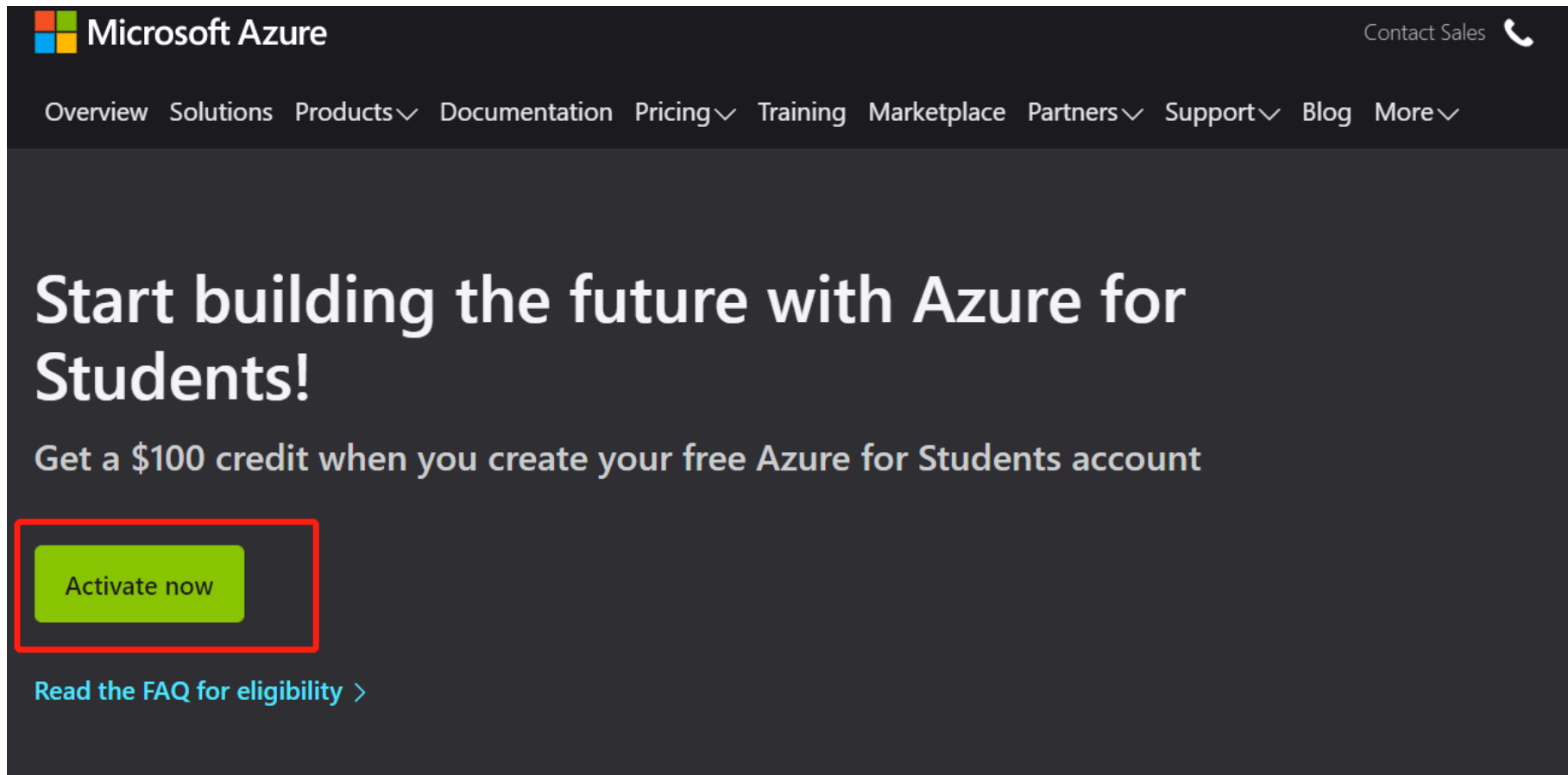
- <https://azure.microsoft.com/en-us/free/students/>



Azure for Students (Cont.)

➤ Register link

- <https://azure.microsoft.com/en-us/free/students/>
- Click “Activate now”



Azure for Students (Cont.)

➤ Log in with CUHK email

- SID@link.cuhk.edu.hk
- Password: Your CUHK Onepass password

CUHK LOGIN
For Office 365, @Link, LibrarySearch and more

Login with
Student: *Student-ID@link.cuhk.edu.hk*
Staff: *alias@cuhk.edu.hk*
Alumni: *alumni-ID@link.cuhk.edu.hk*
Password: OnePass Password

1155*****@link.cuhk.edu.hk

.....

Sign in

Azure for Students (Cont.)

➤ Verification

- Choose “Text me”
- It will send a verification message to your phone

1 Identity verification by phone

Country code

Hong Kong SAR (+852)

Phone number

Text me

Call me

Azure for Students (Cont.)

➤ Verification

- Input your personal information
- Click “Next”

Your profile

Country/Region ⓘ
Hong Kong SAR

Choose the location that matches your billing address. **You cannot change this selection later.** If your country is not listed, the offer is not available in your region. [Learn More](#)

First name
Zuoru

Last name
YANG

Email address for important notifications ⓘ

Phone
Example: 6123 4567


Azure for Students


Get \$100 in Azure credits and free access to popular cloud services plus developer tools like Visual Studio Code

Azure for Students (Cont.)

➤ Agreement

- Choose this option
- And click “sign up”

Your profile 

Agreement 

☒ I agree to the [subscription agreement](#), [offer details](#), and [privacy statement](#).

☐ I would like information, tips, and offers about Azure, including Azure Newsletter, Pricing updates, and other Microsoft products and services.

☐ I would like Microsoft to share my information with select partners so I can receive relevant information about their products and services.

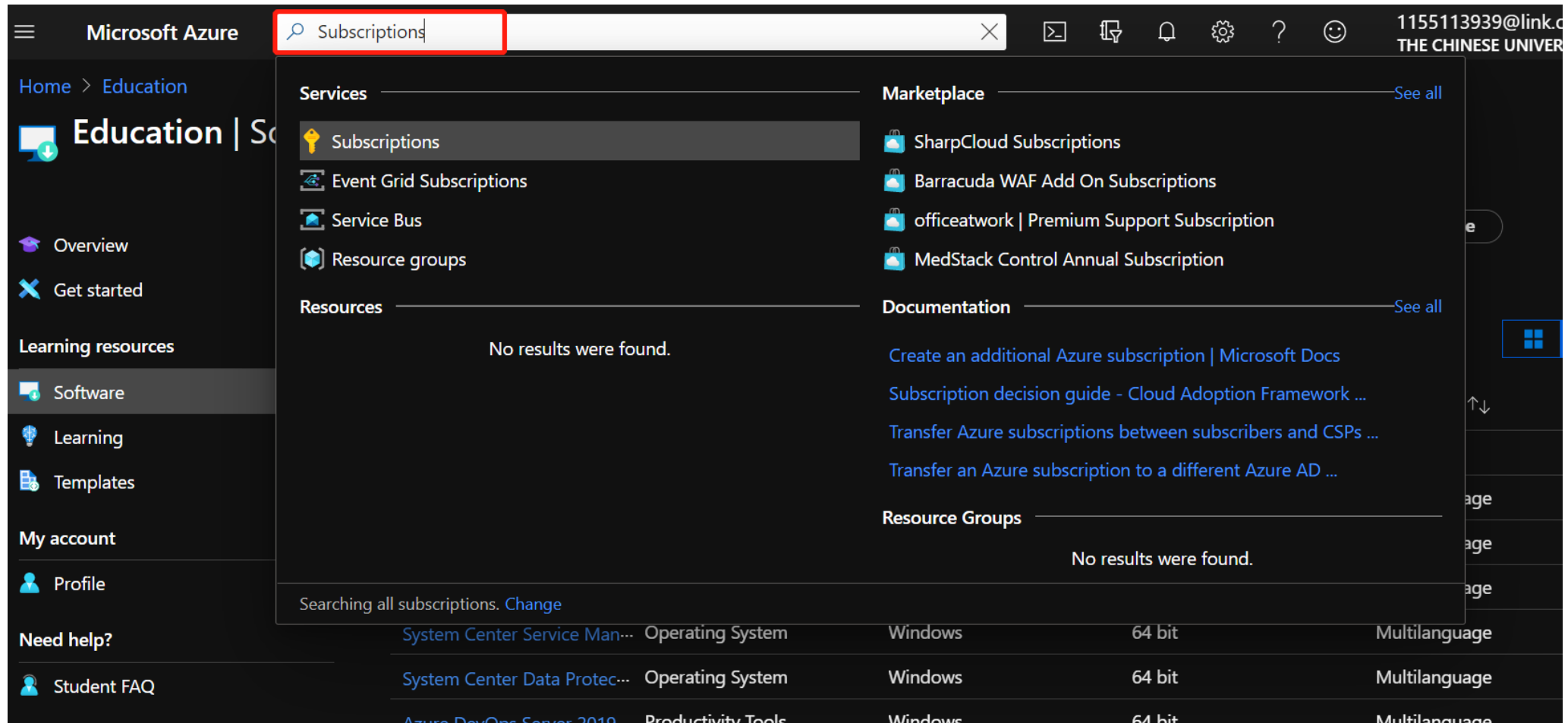
Sign up

Azure for Students

Get \$100 in Azure credits and free access to popular cloud services plus developer tools like Visual Studio Code

Azure for Students (Cont.)

- Check student subscription
 - Search “subscription” to enter the subscription section



Azure for Students (Cont.)

- Check student subscription
 - Search “subscription” to enter the subscription section
 - Make sure the status is “**active**”

Home >

Subscriptions

The Chinese University of Hong Kong

+ Add

View list of subscriptions for which you have role-based access control (RBAC) permissions to manage Azure resources. To view subscriptions for which you have billing access, [click here](#). Showing subscriptions in The Chinese University of Hong Kong directory. Don't see a subscription? [Switch directories](#)

My role ⓘ Status ⓘ

8 selected 3 selected

Apply

Showing 1 of 1 subscriptions ☒ Show only subscriptions selected in the [global subscriptions filter](#) ⓘ

Search

Subscription name ↑↓	Subscription ID ↑↓	My role ↑↓	Current cost	Status ↑↓
⋮ Azure for Students		Account admin	Not available	✓ Active

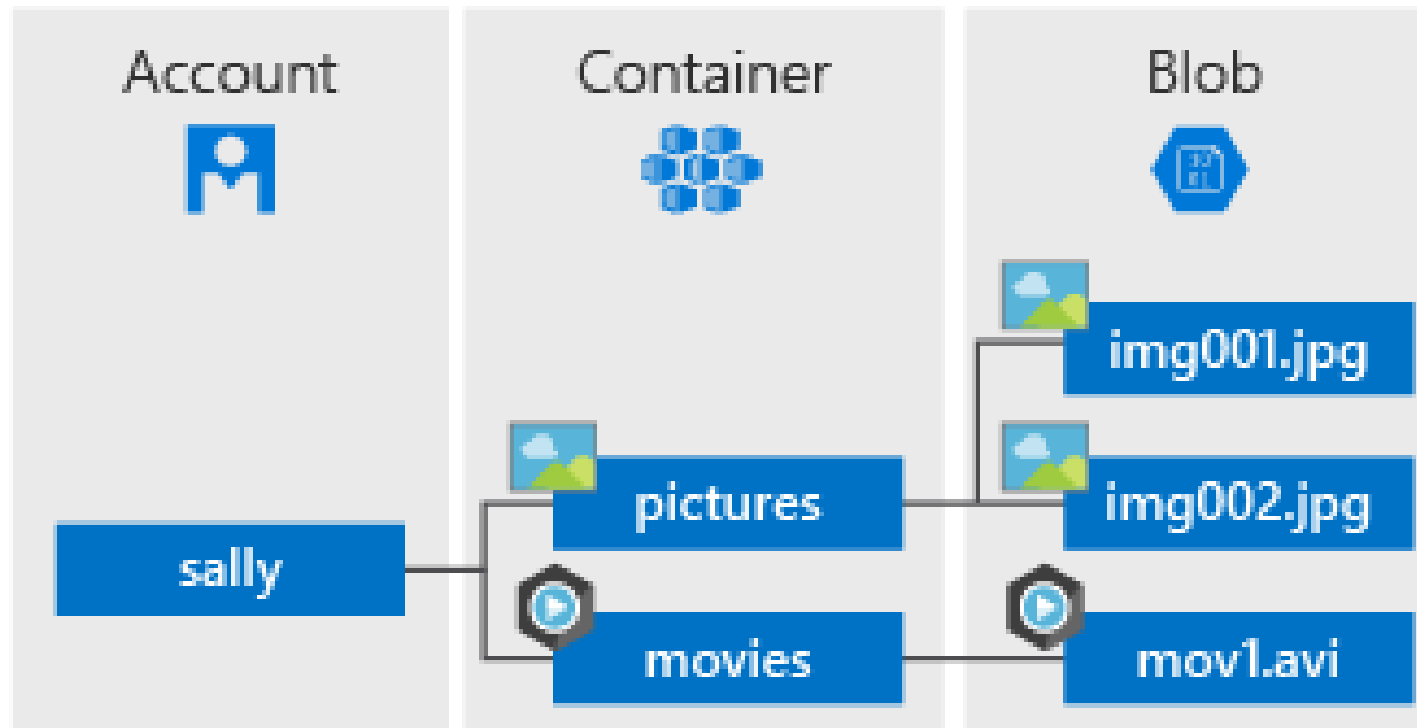
Content

- Azure for Students
- **Azure Blob Storage Service**
- VM time sync
- Java APIs for Azure Storage

Azure Blob Storage Services

➤ What is “Azure Blob Storage”

- Blob → **objects**
- A **container** organizes a set of blobs, similar to a directory in a file system.
- Azure Blob is a flat-namespace system and is the go-to-storage for storing massive amounts of **unstructured** data.



Azure Blob Storage Services (Cont.)

➤ Storage account

- Access to Azure storage via **storage account**.
- A storage account manages **an unlimited number of containers**.

➤ Container

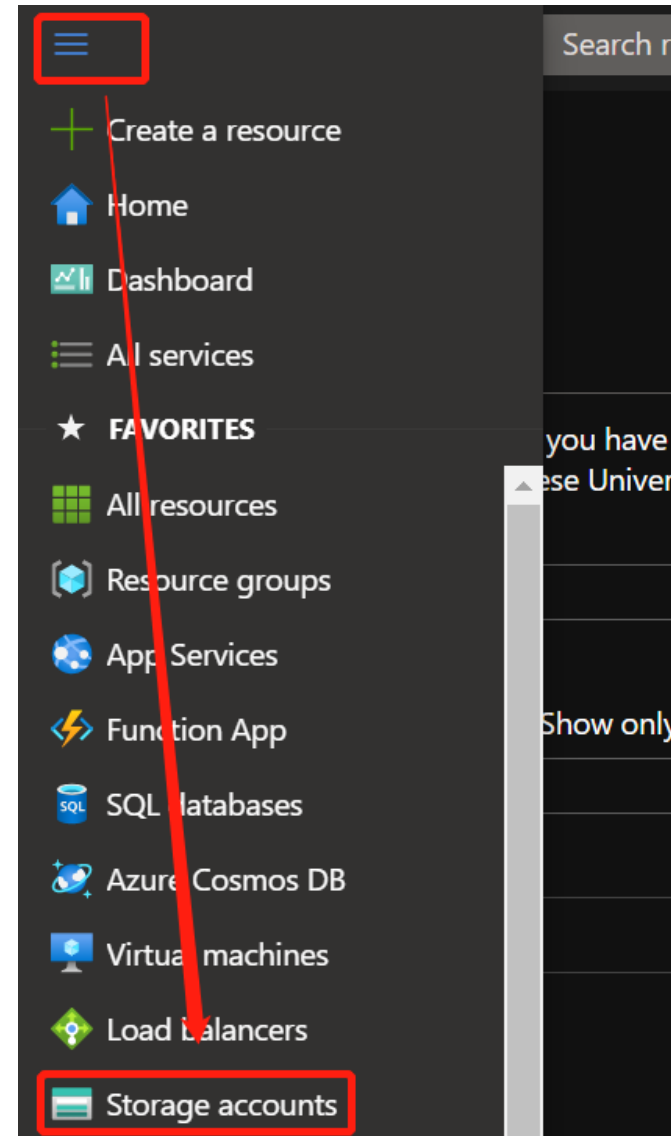
- Container name must be **lowercase**.
- A container can store an **unlimited** number of blobs.

➤ Blob

- An object → a file of any type and size
 - Unstructured data

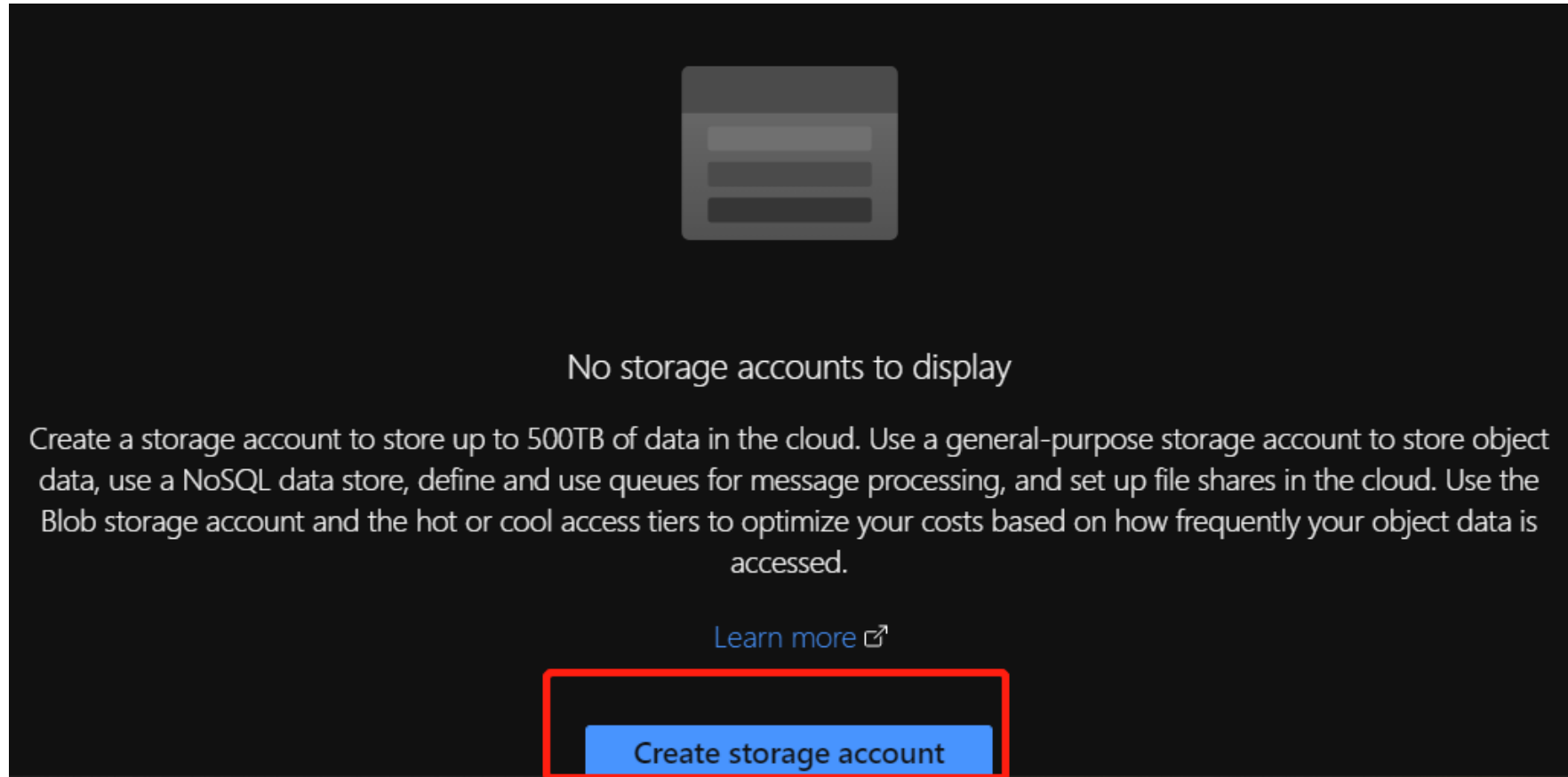
Azure Blob Storage Services (Cont.)

- Create storage account
 - Go to Azure dashboard
 - Click “Storage accounts”



Azure Blob Storage Services (Cont.)

- Create storage account
 - Click “Create storage account”



Azure Blob Storage Services (Cont.)

- Create resource group
 - Click “Create new”

The screenshot shows the 'Project details' section of the Azure portal. It includes a 'Subscription' dropdown set to 'Azure for Students' and a 'Resource group' dropdown. A red box highlights the 'Create new' link below the resource group dropdown. A modal dialog is open, explaining that a resource group is a container for related resources. The dialog has a 'Name' field containing 'csci4180_resource_group' with a green checkmark, and 'OK' and 'Cancel' buttons. The 'OK' button is also highlighted with a red box. Other visible fields include 'Storage account name', 'Location', and 'Performance' (set to 'Standard').

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * Azure for Students

Resource group *

Create new

Instance details

The default deployment model is Resource. Choose the classic deployment model instead. [Choose](#)

Storage account name * ⓘ

Location *

Performance ⓘ ☒ Standard ☐ Premium

A resource group is a container that holds related resources for an Azure solution.

Name * csci4180_resource_group ✓

OK Cancel

Azure Blob Storage Services (Cont.)

➤ Fill in details

- Location, account kind, replication

Subscription * Azure for Students

Resource group * (New) csci4180_resource_group

[Create new](#)

Instance details

The default deployment model is Resource Manager, which supports the latest Azure features. You may choose to deploy using the classic deployment model instead. [Choose classic deployment model](#)

Storage account name * ⓘ csci4180tuto9 ✓

Location * (Asia Pacific) Southeast Asia

Performance ⓘ ☒ Standard ☐ Premium

Account kind ⓘ StorageV2 (general purpose v2)

Replication ⓘ Locally-redundant storage (LRS)

Azure Blob Storage Services (Cont.)

➤ Other settings

- Other settings are **the default choices**
- Click “create”
- Now we have created a storage account

Validation passed

Basics Networking Data protection Advanced Tags **Review + create**

Basics

Subscription	Azure for Students
Resource group	(New) csci4180_resource_group
Location	Southeast Asia
Storage account name	csci4180tuto9
Deployment model	Resource manager
Account kind	StorageV2 (general purpose v2)
Replication	Locally-redundant storage (LRS)
Performance	Standard

Networking

Connectivity method	Public endpoint (all networks)
---------------------	--------------------------------


Create < Previous Next > Download a template for automation

Azure Blob Storage Services (Cont.)

➤ Add access key

- “Storage account” → “Your account” → “Access keys” → “Connection string”

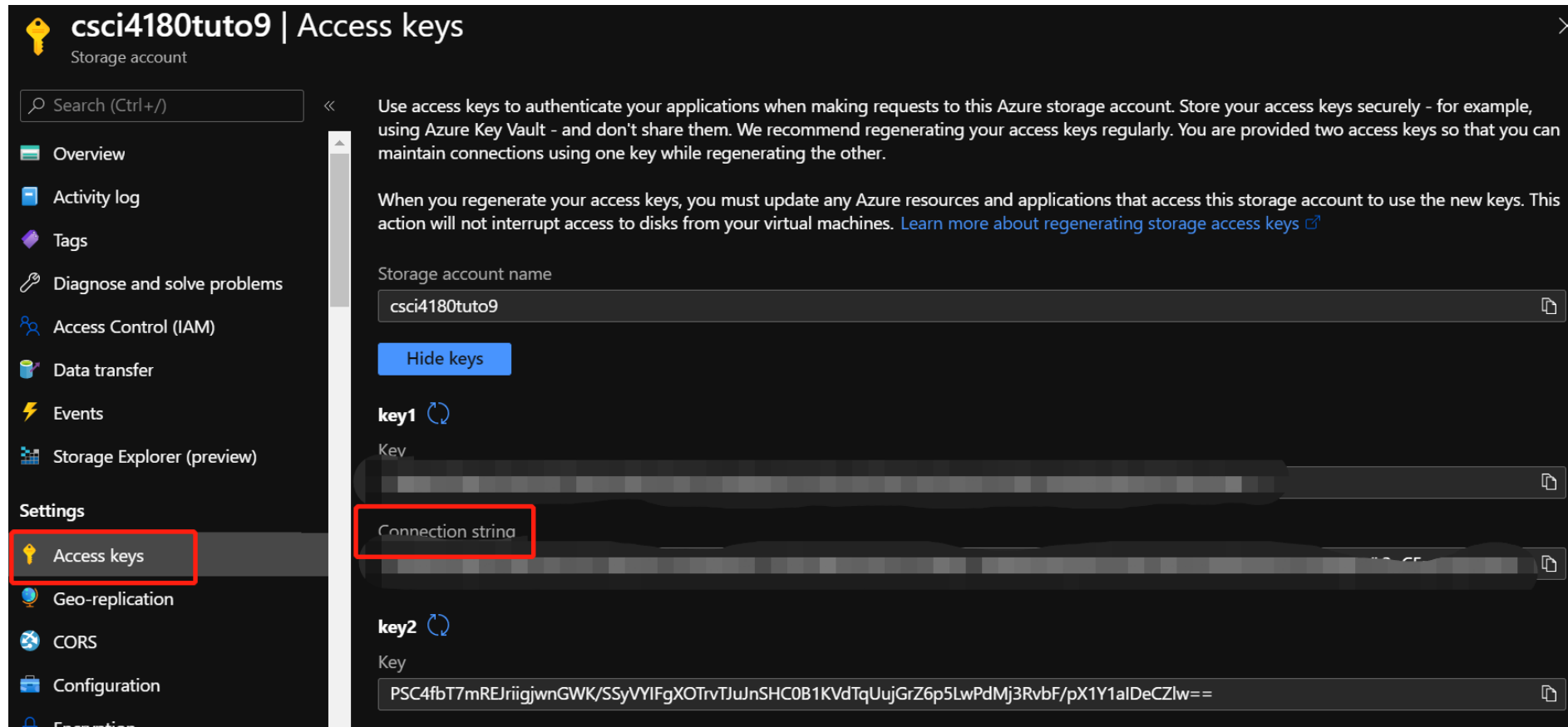
The screenshot shows the 'Storage accounts' page in the Azure portal. At the top, it says 'Storage accounts' with a pin icon and 'The Chinese University of Hong Kong'. Below this is a toolbar with icons for '+ Add', 'Manage view', 'Refresh', 'Export to CSV', 'Open query', 'Assign tags', 'Delete', and 'Feedback'. A filter bar shows 'Filter by name...' and three active filters: 'Subscription == all', 'Resource group == all', and 'Location == all'. Below the filter bar, it says 'Showing 1 to 1 of 1 records.' and has dropdowns for 'No grouping' and 'List view'. A table lists the storage accounts with columns: Name, Type, Kind, Resource group, Location, and Subscription. The first row is highlighted with a red box and contains the following data:

Name	Type	Kind	Resource group	Location	Subscription
 csci4180tuto9	Storage account	StorageV2	csci4180_resource_group	Southeast Asia	Azure for Students

Azure Blob Storage Services (Cont.)

➤ Add access key

- “Storage account” → “Your account” → “Access keys” → “Connection string” → **“connection string” will be used in our program**



Content

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- **VM time sync**
- Java APIs for Azure Storage

VM Time Sync

➤ VM Time Sync

- Before we use java APIs in our course VM, we need to sync the time. Otherwise, we cannot connect to our storage account.
- Command to sync time:
 - `$> sudo ntpdate ntp1.cse.cuhk.edu.hk`

Content

- Azure for Students
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- **Java APIs for Azure Storage**

Java APIs for Azure Storage

- Azure storage SDK for Java
 - Download from course website
- Sample code
 - Sample code is also provided in course website
 - Download from course website

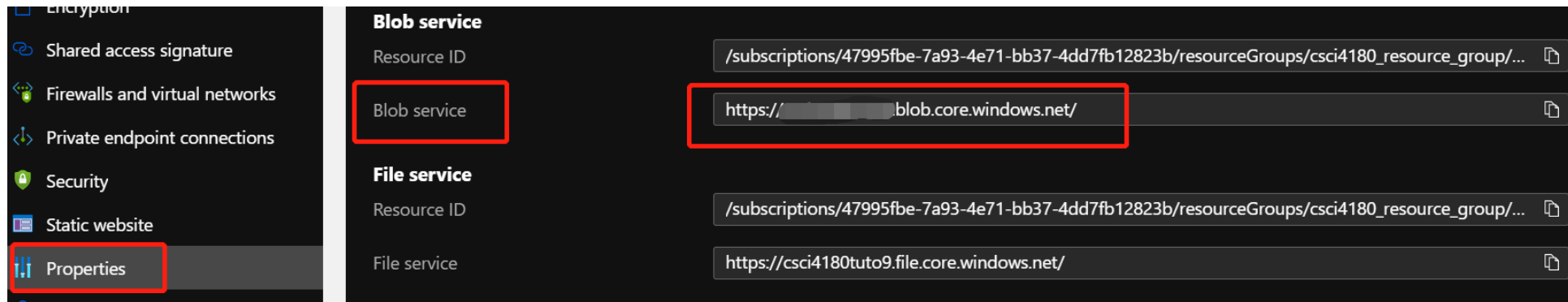
Java APIs for Azure Storage (Cont.)

➤ Connection string

- Set the **storageConnectionString** using the one in your storage account

```
public static final String storageConnectionString =  
    "DefaultEndpointsProtocol=https;  
    AccountName=<account-name>;  
    AccountKey=<account-key>;  
    EndpointSuffix=<endpoint>";
```

- Check the EndpointSuffix (“blob.core.windows.net”)



Java APIs for Azure Storage (Cont.)

➤ Create container

- Retrieve storage account from connection-string

```
• CloudStorageAccount storageAccount =  
  CloudStorageAccount.parse(storageConnectionString);
```

- Create blob client

```
• CloudBlobClient blobClient = storageAccount.createCloudBlobClient();
```

- Get a reference to a container

```
• Suppose the name of the container is "mycontainer"  
• CloudBlobContainer container = blobClient.getContainerReference("mycontainer");
```

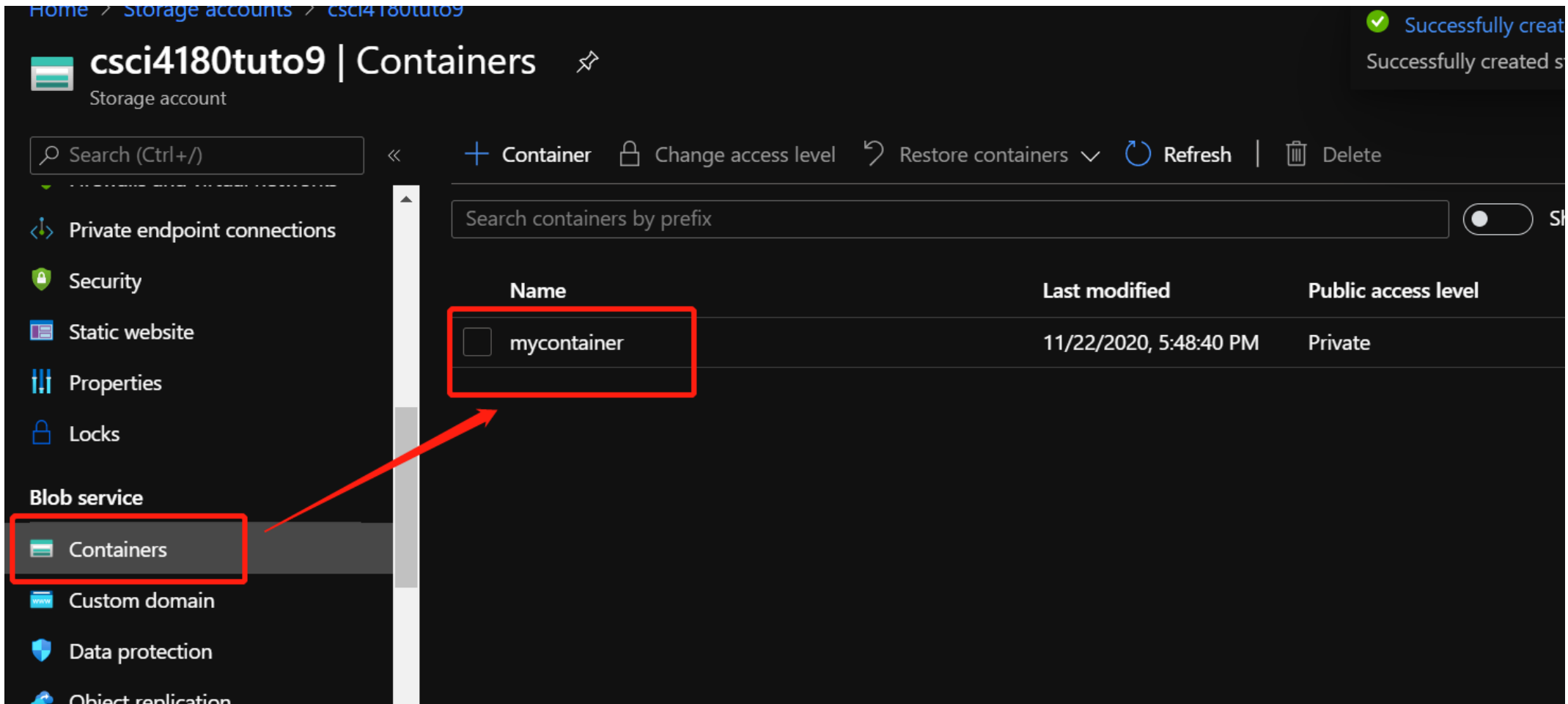
- Create the container if it does not exist

```
• container.createIfNotExist();
```

Java APIs for Azure Storage (Cont.)

➤ Create container

- Note: Container name must be **lower cases**



The screenshot displays the Azure Storage portal interface for a storage account named 'csci4180tuto9'. The 'Containers' section is active, showing a table with one container named 'mycontainer'. The container was last modified on 11/22/2020 at 5:48:40 PM and has a 'Private' public access level. A red box highlights the 'Containers' option in the left-hand navigation menu, and another red box highlights the 'mycontainer' entry in the table. A red arrow points from the 'Containers' menu item to the 'mycontainer' entry. A success message in the top right corner states 'Successfully created container'.

Name	Last modified	Public access level
<input type="checkbox"/> mycontainer	11/22/2020, 5:48:40 PM	Private

Java APIs for Azure Storage (Cont.)

➤ Upload a file from local

- Get a reference to blob in our containers

```
• CloudBlockBlob azureblob = container.getBlockBlobReference("blob.txt");
```

- Upload our local file to the blob

```
• File hello = new File("hello.txt");  
azureblob.upload(new FileInputStream(hello),hello.length());
```

Java APIs for Azure Storage (Cont.)

- Upload a file from local
 - Click into container

Location: [mycontainer](#)

Search blobs by prefix (case-sensitive)

NAME



uploaded.txt

Java APIs for Azure Storage (Cont.)

➤ Download a file to local

- Get reference from the blob

```
• CloudBlockBlob azureblob = container.getBlockBlobReference("uploaded.txt");  
• azureblob.download(new FileOutputStream("downloaded.txt"));
```

- Compare the downloaded file with original file

```
• $> diff downloaded.txt hello.txt
```

Java APIs for Azure Storage (Cont.)

➤ Delete a file

- Get reference from the blob and delete

```
• CloudBlockBlob azureblob = container.getBlockBlobReference("uploaded.txt");  
• azureblob.deleteIfExists();
```

- Check our container

Location: mycontainer

Search blobs by prefix (case-sensitive)

NAME

No blobs found.

Java APIs for Azure Storage (Cont.)

➤ CSE Proxy

- We recommend testing your program in course VMs, which are inside CSE network.
- We need to configure proxy in our source code.

```
System.setProperty("https.proxyHost", "proxy.cse.cuhk.edu.hk");  
System.setProperty("https.proxyPort", "8000");
```

- If you test the program outside CSE network (e.g. CUHK wifi), there is no need to set proxy in your program.
- **Attention**
 - In your submission, please configure proxy in your source code. Because we will test your program using course VMs.

Java APIs for Azure Storage (Cont.)

➤ Sample code

- We provide example code for Azure API usage.
- Compile
`$> make`
- Upload
`$> java -cp ../lib/* AzureAPIDemo upload testdata/testfile.txt testfile.txt`
- Download
`$> java -cp ../lib/* AzureAPIDemo download testfile.txt download.txt`
- Delete
`$> java -cp ../lib/* AzureAPIDemo delete testfile.txt`

Assignment 3 Requirements

➤ Backend storage

- Local
- Azure

➤ Submit

- MyDedup.java
- Makefile

Thank you

Q & A

