Cloud Development, 2021 fall.
Lab2

Report

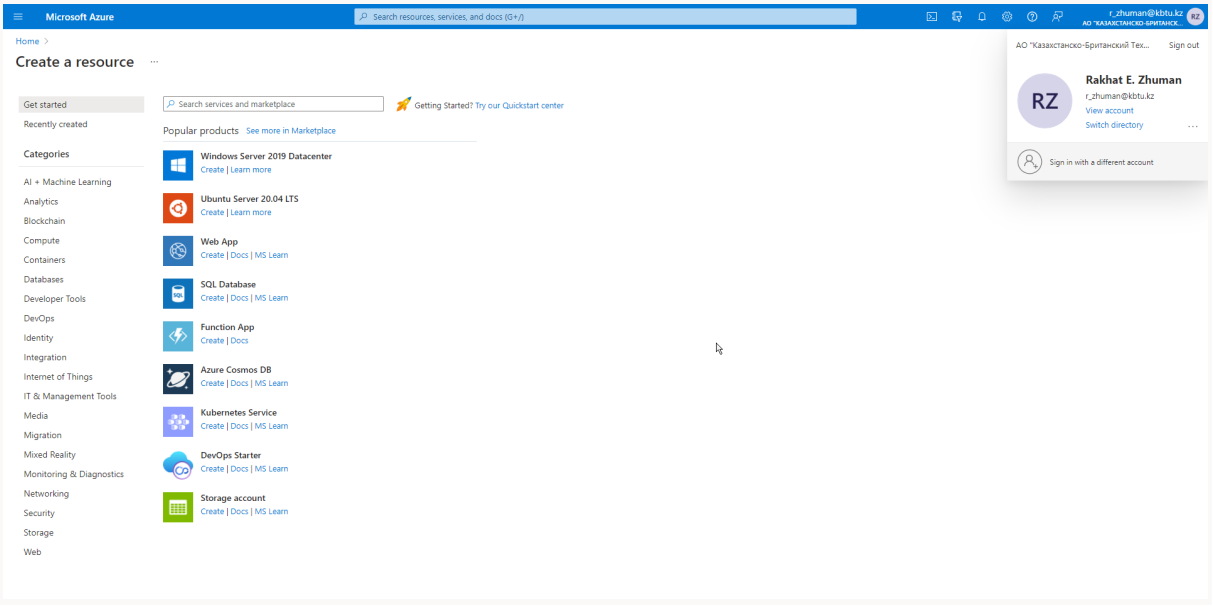
Implement task processing logic by using Azure Functions

made by Zhuman Rakhat

Almaty 2021

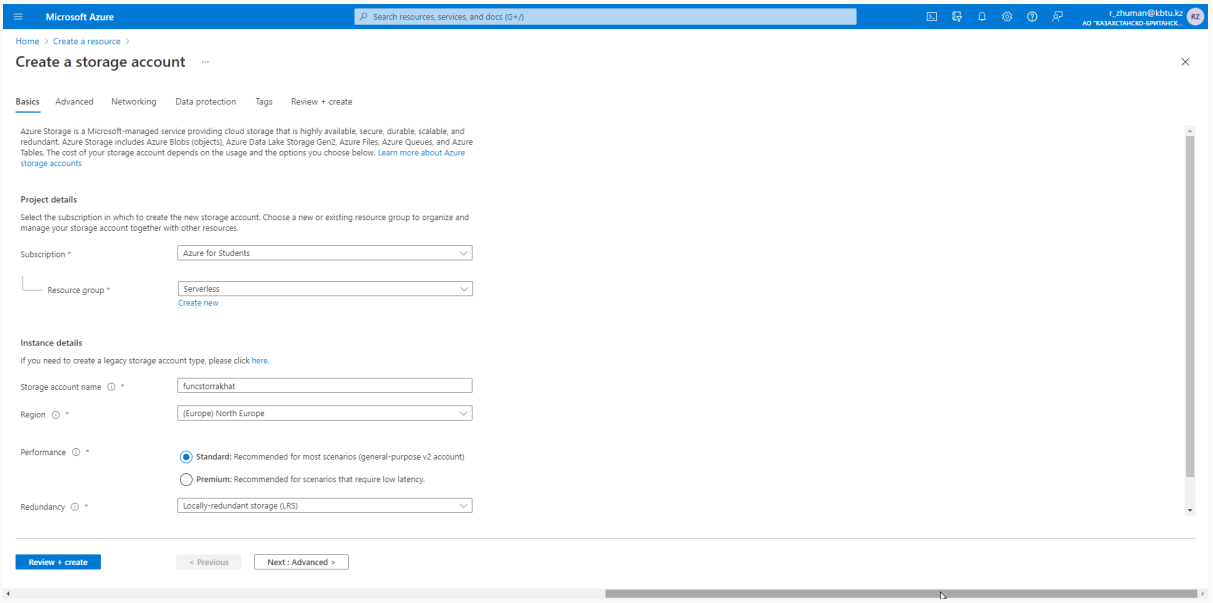
Exercise 1: Create Azure resources

Task 1: Open the Azure portal

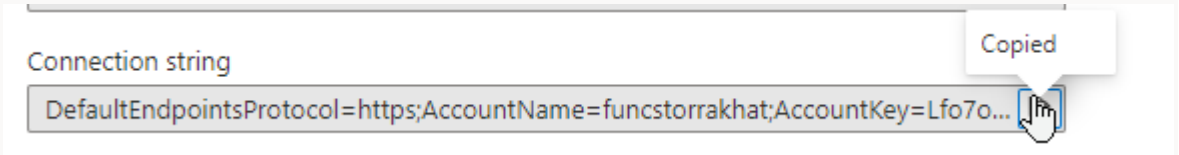


Task 2: Create an Azure Storage account

Create a new storage account with the following details:

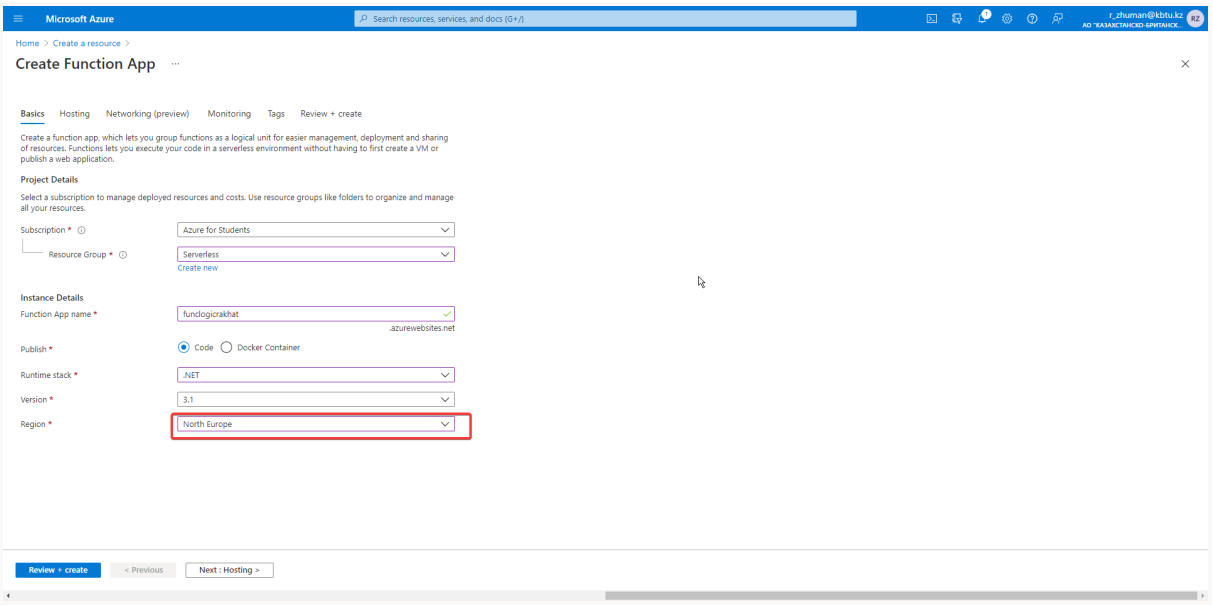


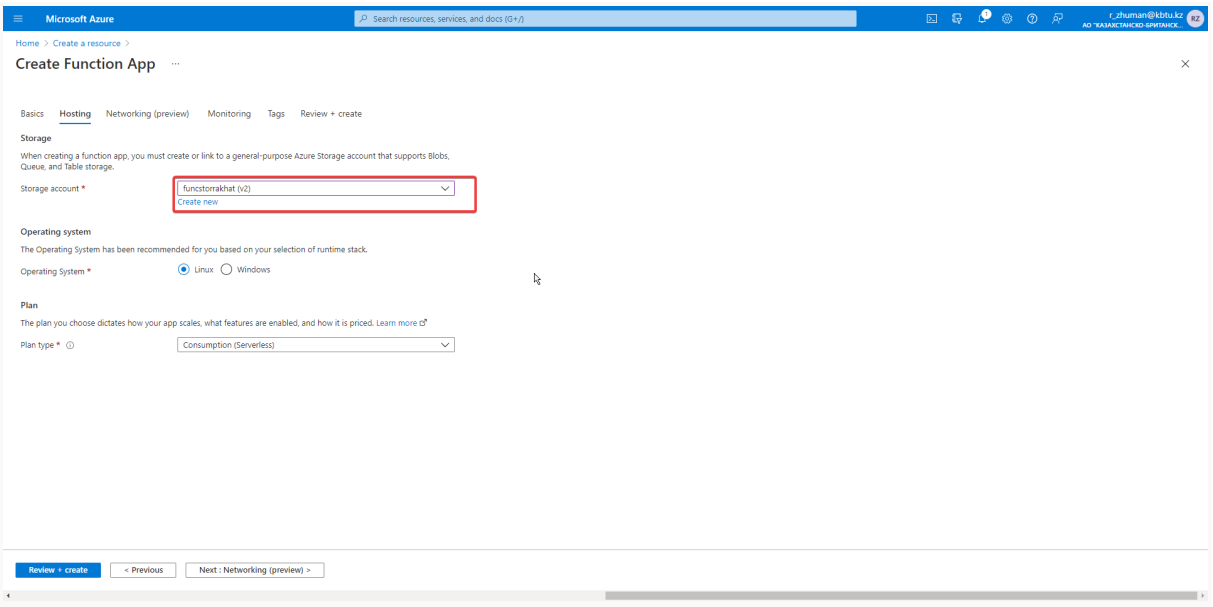
Open the Access Keys section of your newly created storage account instance.

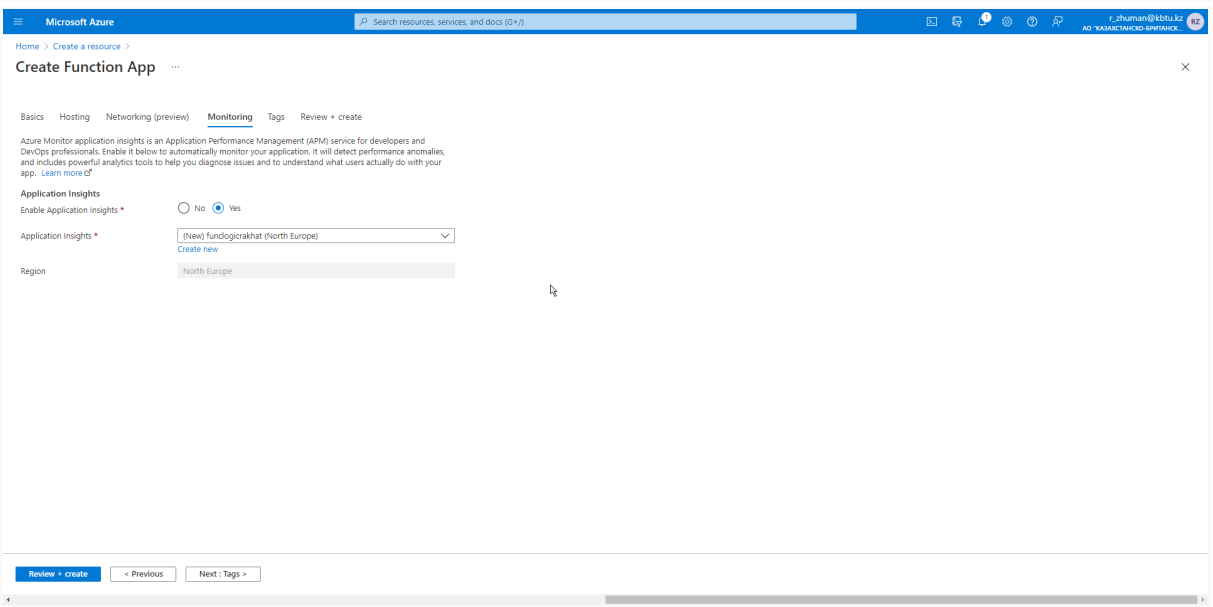


Task 3: Create a function app

According to the instructions, I chose East US but mine storage account did not come out, so I changed it to North Europe and choose funcstorrakhat v2.

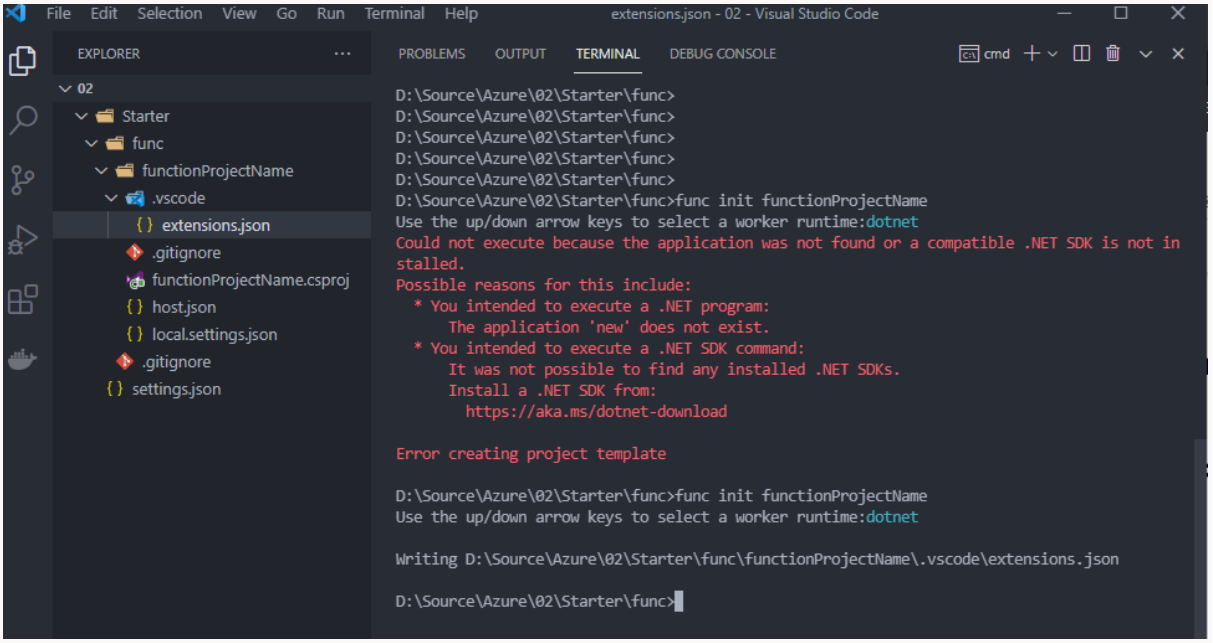

Microsoft Azure
Search resources, services, and docs (G+/)
r_zhuman@kbtu.kz
Home > Create a resource >
Create Function App
Basics Hosting Networking (preview) Monitoring Tags Review + create
Create a function app, which lets you group functions as a logical unit for easier management, deployment and sharing of resources. Functions lets you execute your code in a serverless environment without having to first create a VM or publish a web application.
Project Details
Select a 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 * Serverless
Create new
Instance Details
Function App name * funclogicrakhat
.azurewebsites.net
Publish * Code Docker Container
Runtime stack * .NET
Version * 3.1
Region * North Europe
Review + create
< Previous
Next : Hosting >


Microsoft Azure
Search resources, services, and docs (G+/)
r_zhuman@kbtu.kz
Home > Create a resource >
Create Function App
Basics Hosting Networking (preview) Monitoring Tags Review + create
Storage
When creating a function app, you must create or link to a general-purpose Azure Storage account that supports Blobs, Queue, and Table storage.
Storage account * funcstorrakhat (v2)
Create new
Operating system
The Operating System has been recommended for you based on your selection of runtime stack.
Operating System * Linux Windows
Plan
The plan you choose dictates how your app scales, what features are enabled, and how it is priced. Learn more
Plan type * Consumption (Serverless)
Review + create
< Previous
Next : Networking (preview) >


Microsoft Azure
Search resources, services, and docs (G+/)
r_zhuman@kbtu.kz
Home > Create a resource >
Create Function App
Basics Hosting Networking (preview) Monitoring Tags Review + create
Azure Monitor application insights is an Application Performance Management (APM) service for developers and DevOps professionals. Enable it below to automatically monitor your application. It will detect performance anomalies, and includes powerful analytics tools to help you diagnose issues and to understand what users actually do with your app. Learn more
Application Insights
Enable Application Insights * No Yes
Application Insights * (New) funclogicrakhat (North Europe)
Create new
Region North Europe
Review + create
< Previous
Next : Tags >

Exercise 2: Configure local Azure Functions project

Task 1: Initialize function project



Task 2: Configure connection string

Task 3: Build and validate project

```
D:\Source\Azure\02\Starter\func\functionProjectName>dotnet build
Microsoft (R) Build Engine версии 16.11.0+0538acc04 для .NET
(C) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.

  Определение проектов для восстановления...
  Восстановлен D:\Source\Azure\02\Starter\func\functionProjectName\functionProjectName.csp
roj (за 518 ms).
  functionProjectName -> D:\Source\Azure\02\Starter\func\functionProjectName\bin\Debug\net
coreapp3.1\functionProjectName.dll

Сборка успешно завершена.
    Предупреждений: 0
    Ошибок: 0

Прошло времени 00:00:04.92
```

Exercise 3: Create a function that's triggered by an HTTP request

Task 1: Create an HTTP-triggered function

```
D:\Source\Azure\02\Starter\func\functionProjectName>func new --template "Http Trigger" --n
ame Echo
Use the up/down arrow keys to select a template:Function name: Echo

The function "Echo" was created successfully from the "Http Trigger" template.

D:\Source\Azure\02\Starter\func\functionProjectName>
```

Task 2: Write HTTP-triggered function code

local.settings.json | Echo.cs

```
using Microsoft.AspNetCore.Mvc;
using Microsoft.Azure.WebJobs;
using Microsoft.AspNetCore.Http;
using Microsoft.Extensions.Logging;


public static class Echo{
    [FunctionName("Echo")]
    public static IActionResult Run([HttpTrigger("POST")] HttpRequest request,ILogger logger){
        logger.LogInformation("Received a request");
        return new OkObjectResult(request.Body);
    }

}

```

Task 3: Test the HTTP-triggered function by using httprepl

```
D:\Source\Azure\02\Starter\func\functionProjectName>func start -build
Microsoft (R) Build Engine версии 16.11.0+0538acc04 для .NET
(C) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.

  Определение проектов для восстановления...
  Все проекты обновлены для восстановления.
  functionProjectName -> D:\Source\Azure\02\Starter\func\functionProjectName\bin\output\
functionProjectName.dll

Сборка успешно завершена.
    Предупреждений: 0
    Ошибок: 0

Прошло времени 00:00:05.59



Azure Functions Core Tools
Core Tools Version:       3.0.3734 Commit hash: 61192bb28820be76916f85209916152801483456
  (64-bit)
Function Runtime Version: 3.1.4.0

[2021-09-25T07:27:26.807Z] Found D:\Source\Azure\02\Starter\func\functionProjectName\fun
ctionProjectName.csproj. Using for user secrets file configuration.

Functions:

        Echo: [POST] http://localhost:7071/api/Echo

For detailed output, run func with --verbose flag.
```

```
Microsoft Windows [Version 10.0.19043.1237]
(c) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.
Clink v0.4.9 [git:2fd2c2] Copyright (c) 2012-2016 Martin Ridgers
http://mridgers.github.io/clink


C:\Users\zhuma>httprepl http://localhost:7071
Welcome to HttpRepl 5.0!
------------------------

Telemetry
---------
The .NET tools collect usage data in order to help us improve your experience. The data is collected by Microsoft and sh
ared with the community. You can opt-out of telemetry by setting the DOTNET_HTTPREPL_TELEMETRY_OPTOUT environment variab
le to '1' or 'true' using your favorite shell.

Read more about HttpRepl telemetry: https://aka.ms/httprepl-telemetry
Read more about .NET CLI Tools telemetry: https://aka.ms/dotnet-cli-telemetry

(Disconnected)> connect http://localhost:7071
Using a base address of http://localhost:7071/
Unable to find an OpenAPI description
For detailed tool info, see https://aka.ms/http-repl-doc

http://localhost:7071/>
No matching command found
Execute 'help' to see available commands

http://localhost:7071/>
```

```
http://localhost:7071/api/echo> post --content 3
HTTP/1.1 200 OK
Date: Sat, 25 Sep 2021 07:32:49 GMT
Server: Kestrel
Transfer-Encoding: chunked

3


http://localhost:7071/api/echo> post --content 5
HTTP/1.1 200 OK
Date: Sat, 25 Sep 2021 07:33:13 GMT
Server: Kestrel
Transfer-Encoding: chunked

5


http://localhost:7071/api/echo> post --content "Hello"
HTTP/1.1 200 OK
Date: Sat, 25 Sep 2021 07:33:24 GMT
Server: Kestrel
Transfer-Encoding: chunked

Hello


http://localhost:7071/api/echo> post --content "{"msg":" "Successful"}"
HTTP/1.1 404 Not Found
Content-Length: 0
Date: Sat, 25 Sep 2021 07:33:44 GMT
Server: Kestrel




http://localhost:7071/api/echo> exit

C:\Users\zhuma>
```

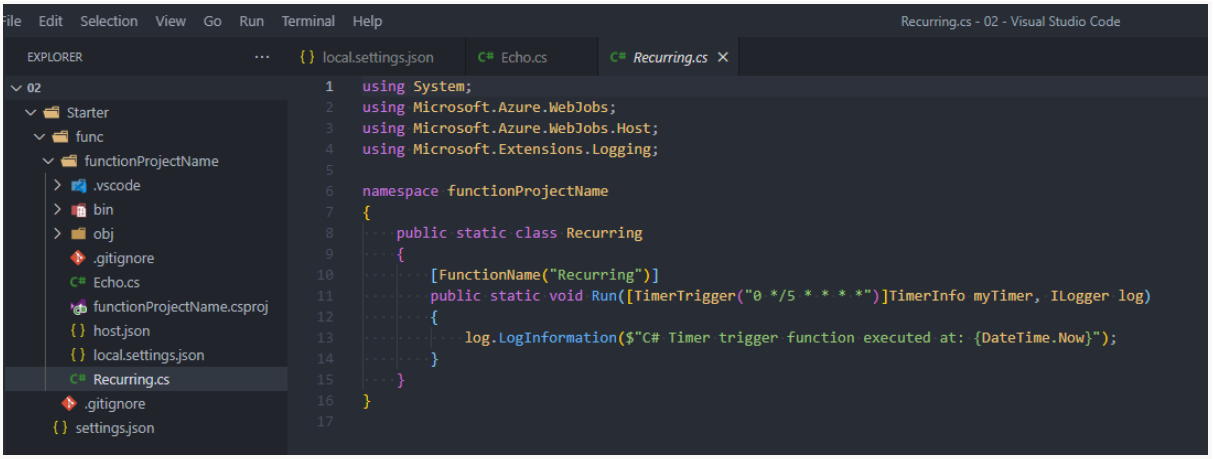
```
For detailed output, run func with --verbose flag.
[2021-09-25T07:32:49.873Z] Executing 'Echo' (Reason='This function was programmatically called via the host APIs.', Id=d60aef37-ebf2-4107-8ee1-0e707078e1c7)
[2021-09-25T07:32:49.882Z] Received a request
[2021-09-25T07:32:49.895Z] Executed 'Echo' (Succeeded, Id=d60aef37-ebf2-4107-8ee1-0e707078e1c7, Duration=44ms)
[2021-09-25T07:33:14.585Z] Executing 'Echo' (Reason='This function was programmatically called via the host APIs.', Id=236f477e-b7f4-46f3-ac18-baba2c724e52)
[2021-09-25T07:33:14.589Z] Received a request
[2021-09-25T07:33:14.591Z] Executed 'Echo' (Succeeded, Id=236f477e-b7f4-46f3-ac18-baba2c724e52, Duration=7ms)
[2021-09-25T07:33:25.545Z] Executing 'Echo' (Reason='This function was programmatically called via the host APIs.', Id=57421710-068b-48be-8b11-ddb75044758d)
[2021-09-25T07:33:25.549Z] Received a request
[2021-09-25T07:33:25.552Z] Executed 'Echo' (Succeeded, Id=57421710-068b-48be-8b11-ddb75044758d, Duration=7ms)
```

Exercise 4: Create a function that triggers on a schedule

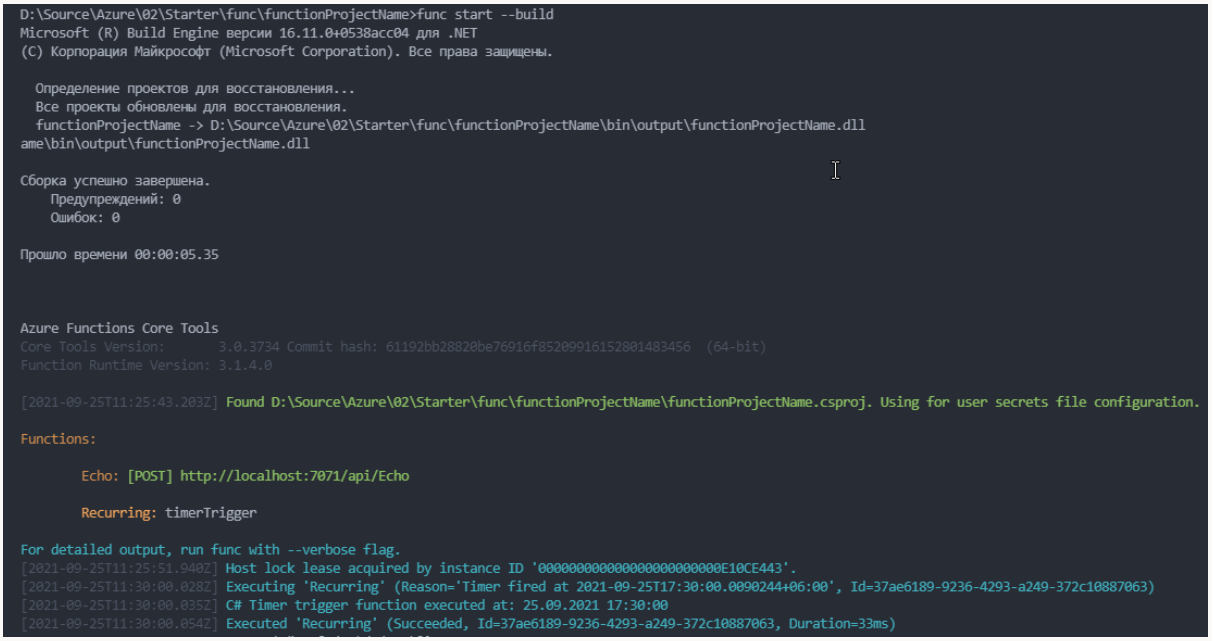
Task 1: Create a schedule-triggered function

```
D:\Source\Azure\02\Starter\func\functionProjectName>func new --template "
Timer Trigger" --name Recurring
Use the up/down arrow keys to select a template:Function name: Recurring

The function "Recurring" was created successfully from the "Timer Trigger
" template.

D:\Source\Azure\02\Starter\func\functionProjectName>
```

Task 2: Observe function code



Task 3: Observe function runs



Task 4: Update the function integration configuration

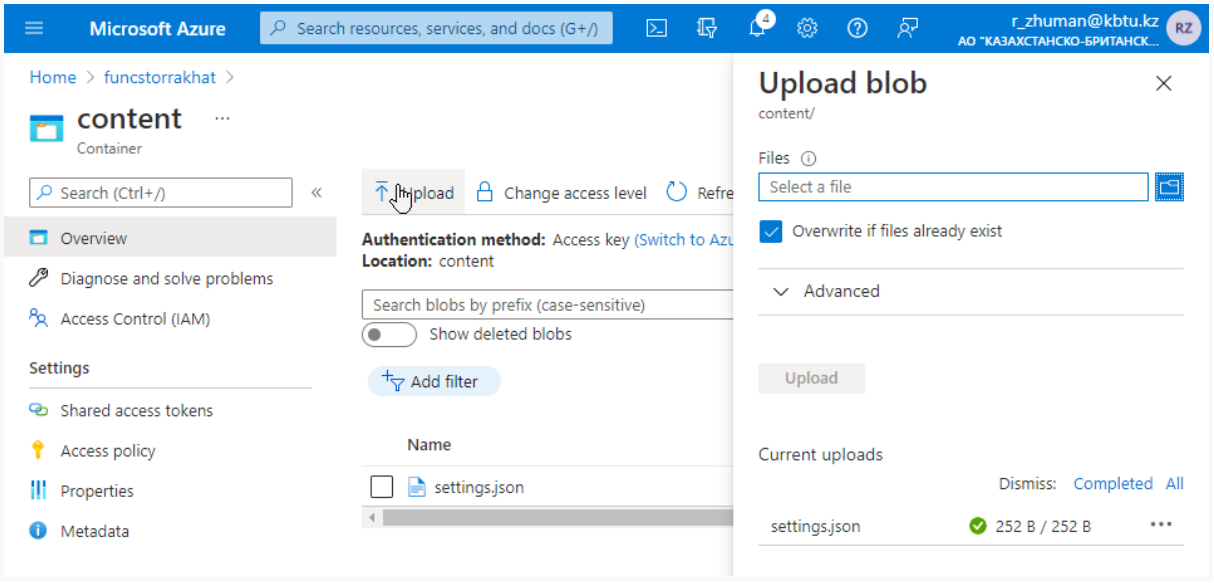
```
{ } local.settings.json   C# Echo.cs   C# Recurring.cs ×

1   using System;
2   using Microsoft.Azure.WebJobs;
3   using Microsoft.Azure.WebJobs.Host;
4   using Microsoft.Extensions.Logging;
5
6   namespace functionProjectName
7   {
8       public static class Recurring
9       {
10          [FunctionName("Recurring")]
11          public static void Run([TimerTrigger("*/30 * * * * *")]TimerInfo myTimer, ILogger log)
12          {
13              log.LogInformation($"C# Timer trigger function executed at: {DateTime.Now}");
14          }
15      }
16  }
```

Task 5: Observe function runs

```
Azure Functions Core Tools
Core Tools Version:       3.0.3734 Commit hash: 61192bb28820be76916f85209916152801483456  (64-bit)
Function Runtime Version: 3.1.4.0

[2021-09-25T11:32:20.773Z] Found D:\Source\Azure\02\Starter\func\functionProjectName\functionProjectName.csproj. Using for user secrets file configuration.

Functions:

        Echo: [POST] http://localhost:7071/api/Echo

        Recurring: timerTrigger

For detailed output, run func with --verbose flag.
[2021-09-25T11:32:28.171Z] Host lock lease acquired by instance ID '00000000000000000000000E10CE443'.
[2021-09-25T11:32:30.023Z] Executing 'Recurring' (Reason='Timer fired at 2021-09-25T17:32:30.0107052+06:00', Id=b776e29c-1d88-4f9e-9026-fe38a9af9f82)
[2021-09-25T11:32:30.032Z] C# Timer trigger function executed at: 25.09.2021 17:32:30
[2021-09-25T11:32:30.048Z] Executed 'Recurring' (Succeeded, Id=b776e29c-1d88-4f9e-9026-fe38a9af9f82, Duration=30ms)
[2021-09-25T11:33:00.008Z] Executing 'Recurring' (Reason='Timer fired at 2021-09-25T17:33:00.0044054+06:00', Id=828657dd-5515-43cf-aaeb-39edc9cbdf8b)
[2021-09-25T11:33:00.011Z] C# Timer trigger function executed at: 25.09.2021 17:33:00
[2021-09-25T11:33:00.014Z] Executed 'Recurring' (Succeeded, Id=828657dd-5515-43cf-aaeb-39edc9cbdf8b, Duration=9ms)
[2021-09-25T11:33:30.002Z] Executing 'Recurring' (Reason='Timer fired at 2021-09-25T17:33:30.0011354+06:00', Id=e9337228-5c32-4ab0-89ae-843bd9b881b5)
[2021-09-25T11:33:30.005Z] C# Timer trigger function executed at: 25.09.2021 17:33:30
[2021-09-25T11:33:30.007Z] Executed 'Recurring' (Succeeded, Id=e9337228-5c32-4ab0-89ae-843bd9b881b5, Duration=6ms)
```

Exercise 5: Create a function that integrates with other services

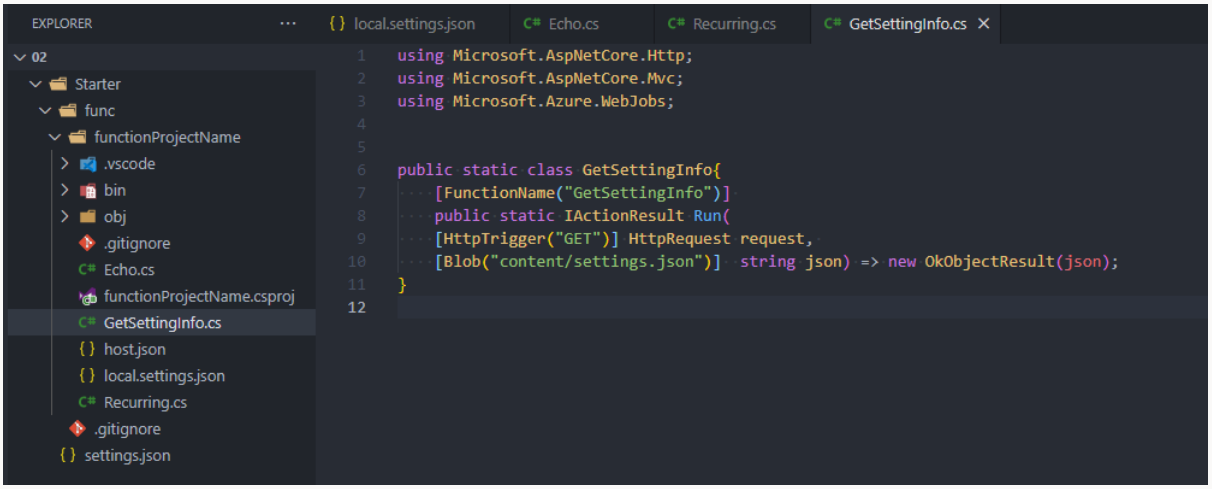
Task 1: Upload sample content to Azure Blob Storage



Task 2: Create a Blob-triggered function

```
D:\Source\Azure\02\Starter\func\functionProjectName>func new --template "Blob Trigger" --name GetSettingInfo
Use the up/down arrow keys to select a template:Function name: GetSettingInfo

The function "GetSettingInfo" was created successfully from the "Blob Trigger" template.

D:\Source\Azure\02\Starter\func\functionProjectName>
```

Task 3: Write Blob-inputted function code



Task 4: Test the Blob-inputted function by using httprepl

```
C:\Users\zhuma>httprepl http://localhost:7071
(Disconnected)> connect http://localhost:7071
Using a base address of http://localhost:7071/
Unable to find an OpenAPI description
For detailed tool info, see https://aka.ms/http-repl-doc

http://localhost:7071/> cd api

http://localhost:7071/api> cd getsettinginfo

http://localhost:7071/api/getsettinginfo> get
HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
Date: Sat, 25 Sep 2021 11:41:17 GMT
Server: Kestrel
Transfer-Encoding: chunked

{
    "version": "0.2.4",
    "root": "/usr/libexec/mews_principal/",
    "device": {
        "id": "21e46d2b2b926cba031a23c6919"
    },
    "notifications": {
        "email": "joseph.price@contoso.com",
        "phone": "(425) 555-0162 x4151"
    }
}


http://localhost:7071/api/getsettinginfo> exit

C:\Users\zhuma>
```

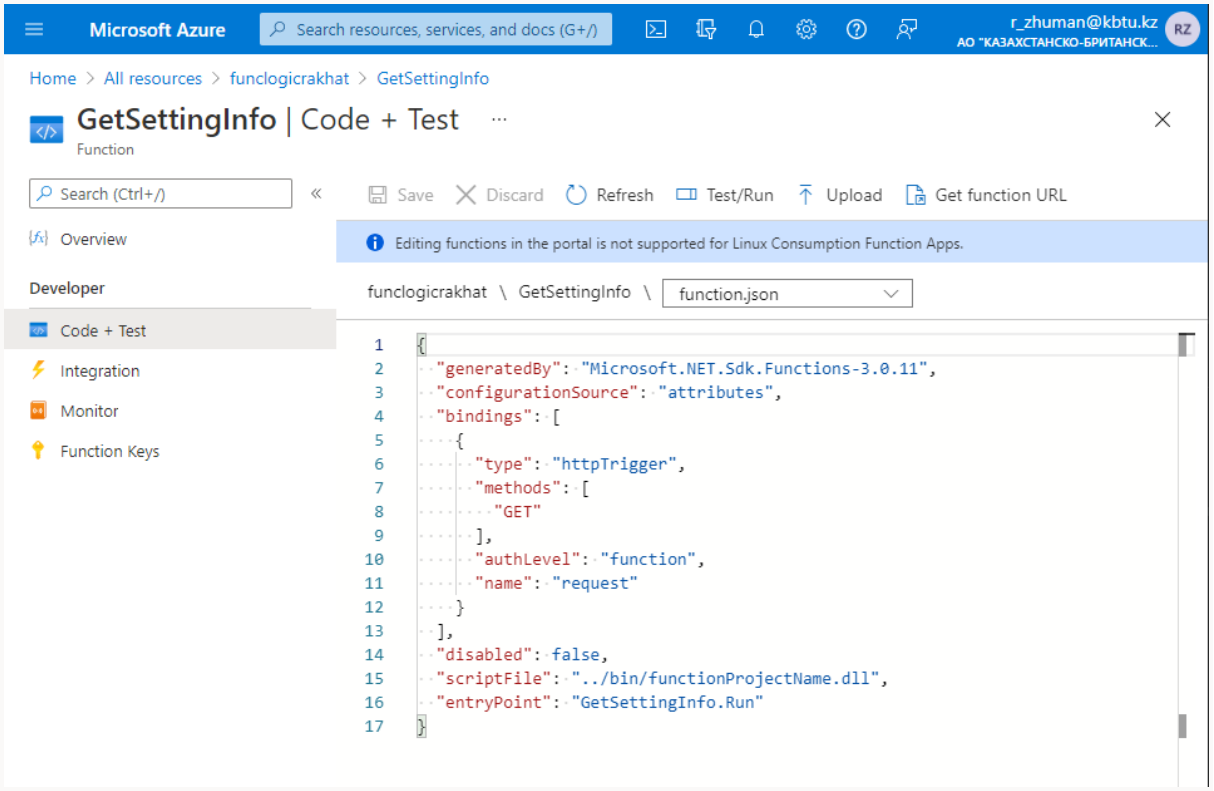
```
        GetSettingInfo: [GET] http://localhost:7071/api/GetSettingInfo

        Recurring: timerTrigger

For detailed output, run func with --verbose flag.
[2021-09-25T11:40:45.224Z] Host lock lease acquired by instance ID '000000000000000000000000E10CE443'.
[2021-09-25T11:41:00.025Z] Executing 'Recurring' (Reason='Timer fired at 2021-09-25T17:41:00.0126383+06:00', Id=11105956-9bc8-49f6-9a51-c973b16013fe)
[2021-09-25T11:41:00.033Z] C# Timer trigger function executed at: 25.09.2021 17:41:00
[2021-09-25T11:41:00.051Z] Executed 'Recurring' (Succeeded, Id=11105956-9bc8-49f6-9a51-c973b16013fe, Duration=30ms)
[2021-09-25T11:41:17.954Z] Executing 'GetSettingInfo' (Reason='This function was programmatically called via the host APIs.', Id=268b2d27-57ab-4ce1-a8df-0cbe4fe70ce1)
[2021-09-25T11:41:17.960Z] Executed 'GetSettingInfo' (Succeeded, Id=268b2d27-57ab-4ce1-a8df-0cbe4fe70ce1, Duration=1058ms)
```

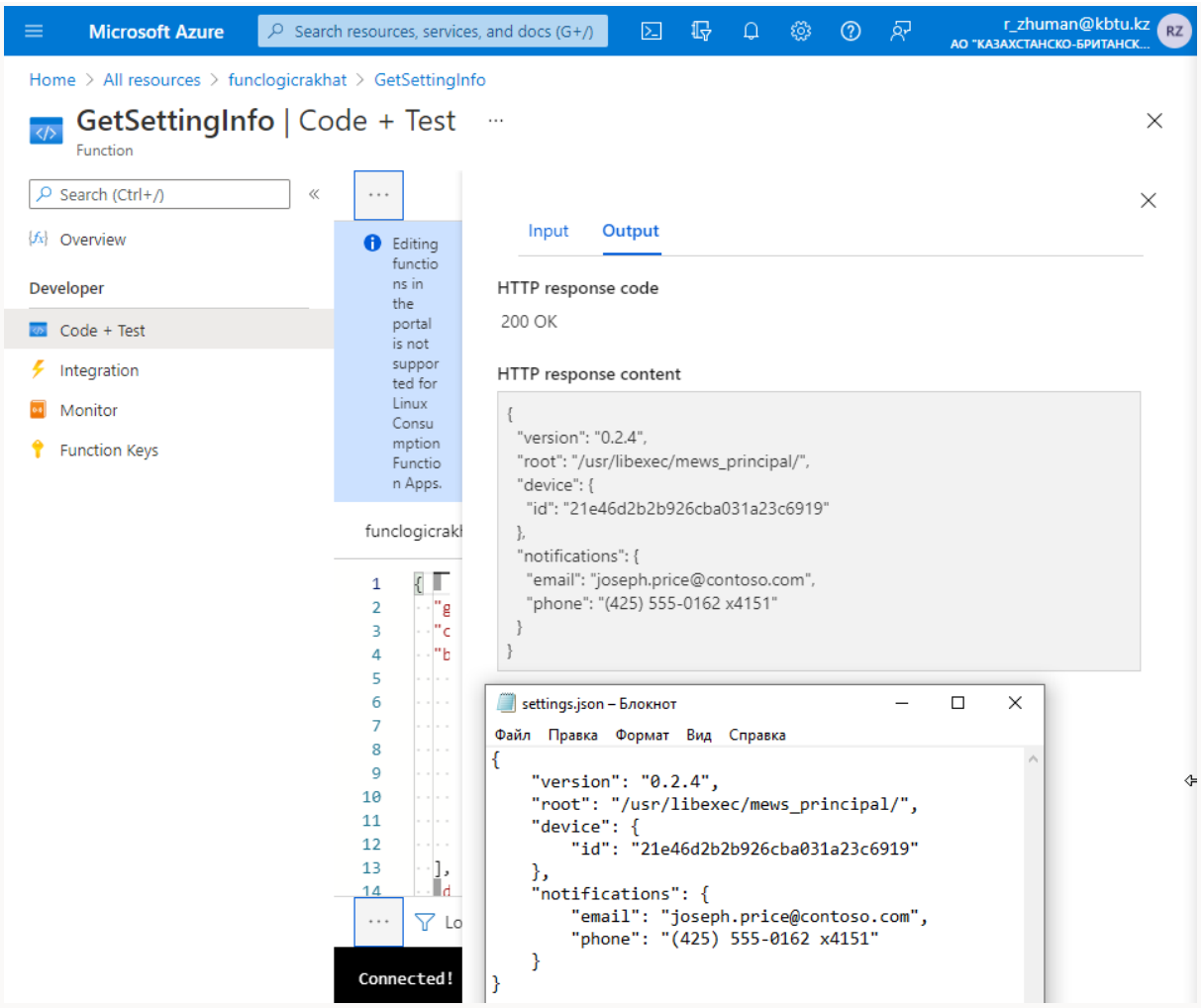
Exercise 6: Deploy a local function project to an Azure Functions app

Task 1: Deploy using the Azure Functions Core Tools

```
D:\Source\Azure\02\Starter\func\functionProjectName>func azure functionapp publish funclogicrakhat
Microsoft (R) Build Engine версии 16.11.0+0538acc04 для .NET
(C) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.

  Определение проектов для восстановления...
  Все проекты обновлены для восстановления.
  functionProjectName -> D:\Source\Azure\02\Starter\func\functionProjectName\bin\publish\functionProjectName.dll

Сборка успешно завершена.
    Предупреждений: 0
    Ошибок: 0

Прошло времени 00:00:05.58


Getting site publishing info...
Uploading package...
Uploading 2,62 MB [##################################################]
Upload completed successfully.
Deployment completed successfully.
Syncing triggers...
Functions in funclogicrakhat:
    Echo - [httpTrigger]
        Invoke url: https://funclogicrakhat.azurewebsites.net/api/echo?code=tDxaz2aH9U4far0ucT4LZYu5658l65aXana/eVC3ewK8P4rN22GMAQ==

    GetSettingInfo - [httpTrigger]
        Invoke url: https://funclogicrakhat.azurewebsites.net/api/getsettinginfo?code=vrmEohUpfvKG2zJKCdgMW4TpSfB6xLLUPWQF0I0HpMXlpEWIX3SBlg==

    Recurring - [timerTrigger]
```

Task 2: Validate deployment

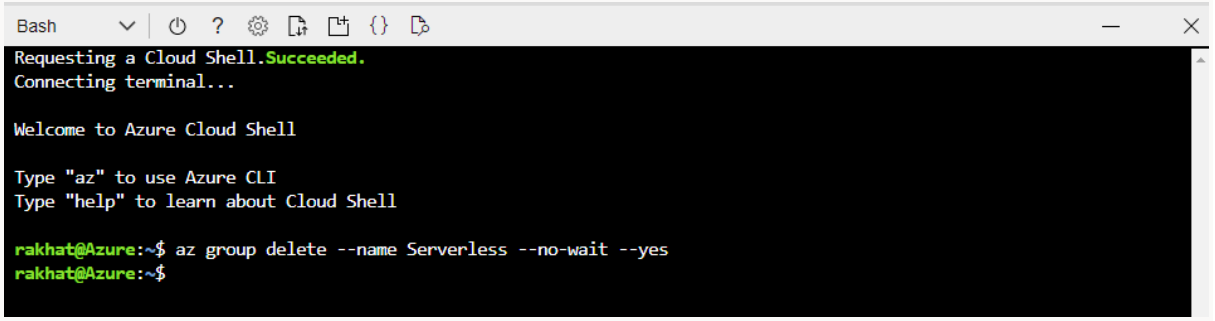




Exercise 7: Clean up your subscription

Task 1: Open Azure Cloud Shell and list resource groups

Task 2: Delete a resource group



Task 3: Close the active application

- Ok)