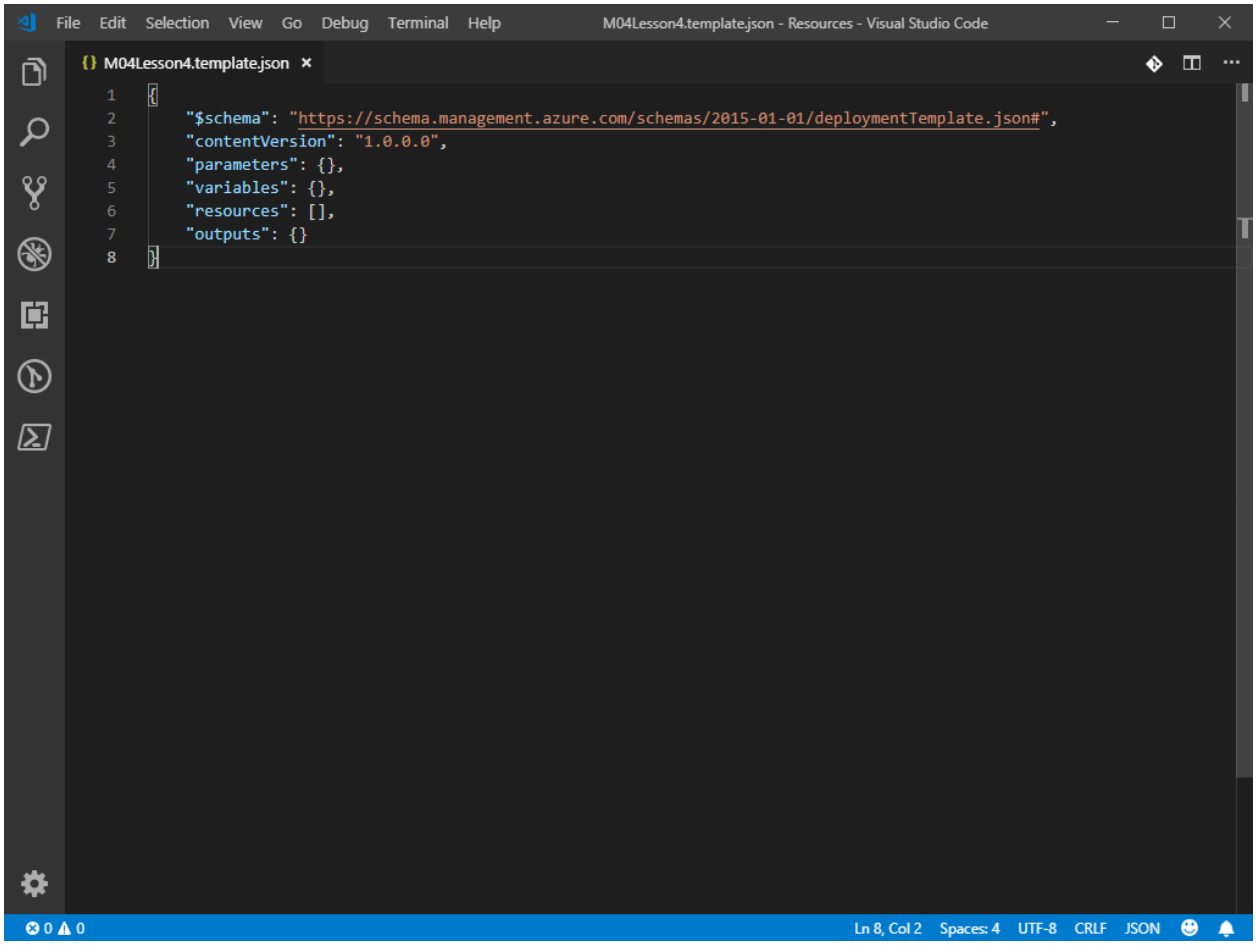
Module 4 - Lesson 4

⚠ Please note that the lab environment is restricted by policy. You will be able to create only the Azure resources required by the lab.

Create a new ARM template file

1. Open `C:\Lab_Files\M04` in Visual Studio Code and create a subfolder named `S04`
2. Create a new file in `C:\Lab_Files\M04\S04` named `M04Lesson4.template.json` and open the file.
3. Add the ARM template skeleton using the `arm!` code snippet



Add parameters to the ARM template

1. Add the following parameters to the `"parameters": {}` section
    a. `regions`
        i. `"type": "array"`

ii. `"defaultValue": ["eastus", "westus"]`

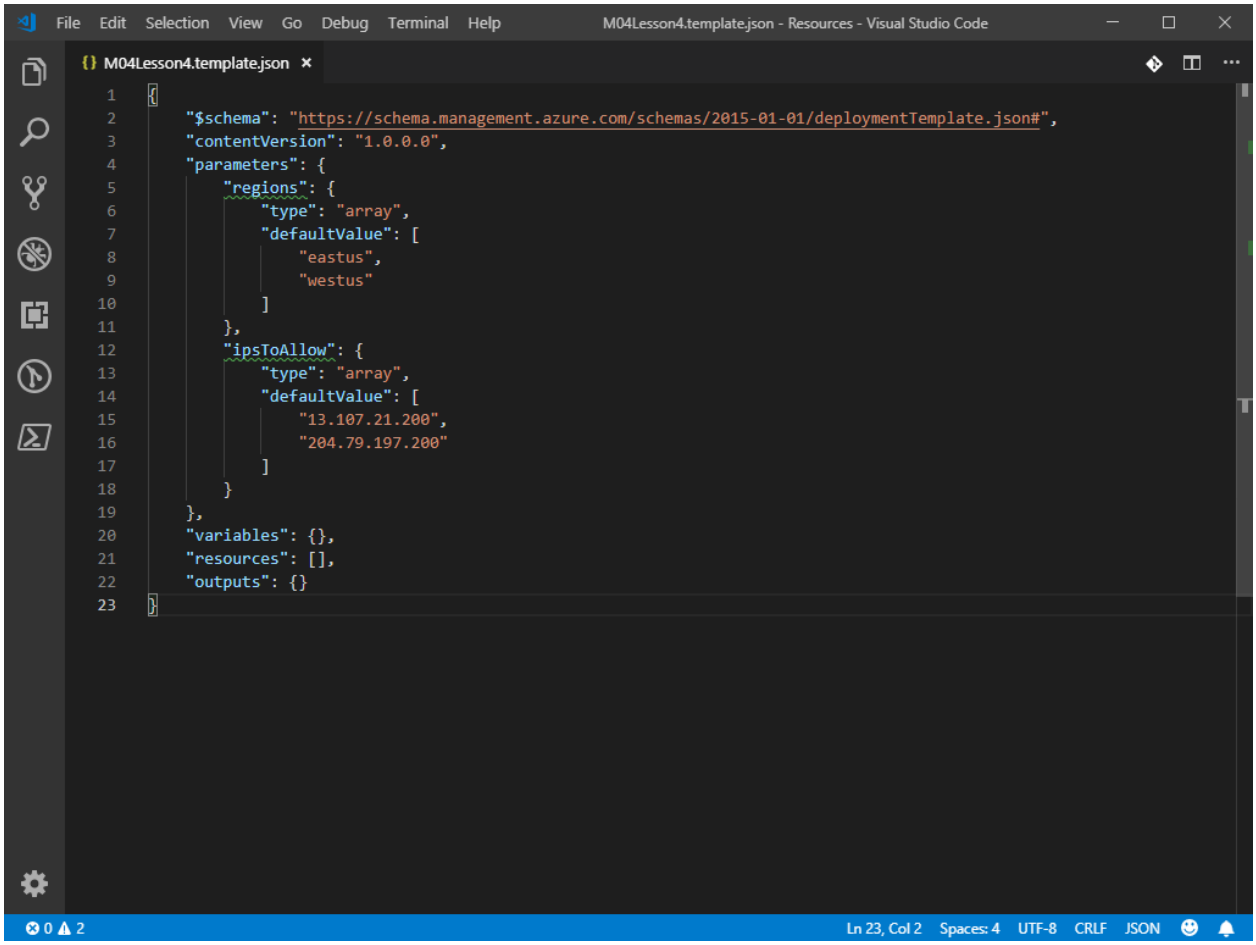
iii. **NOTE:** These must be valid Azure regions and can be found with `Get-AzLocation`

b. `ipsToAllow`

i. `"type": "array"`

ii. `"defaultValue": ["13.107.21.200", "204.79.197.200"]`

iii. **NOTE:** These entries must be public IP's. The default values above are resolved from bing.com



Add a variable iteration copy loop to the ARM template

1. Add a variable iteration copy loop to the `"variables": {}` section
2. Move your cursor in between the `{}` brackets on the line containing `"variables": {},` and press `Enter` to create a new line
3. Type `"copy": []`. With your curser between the `[]`, press `Enter` to create a new line
4. Add a new object by typing `{}`. With your curser between the `{}`, press `Enter` to create a new line
5. Inside the `{}` object, add the following

a. `"name": "storageAccounts"`

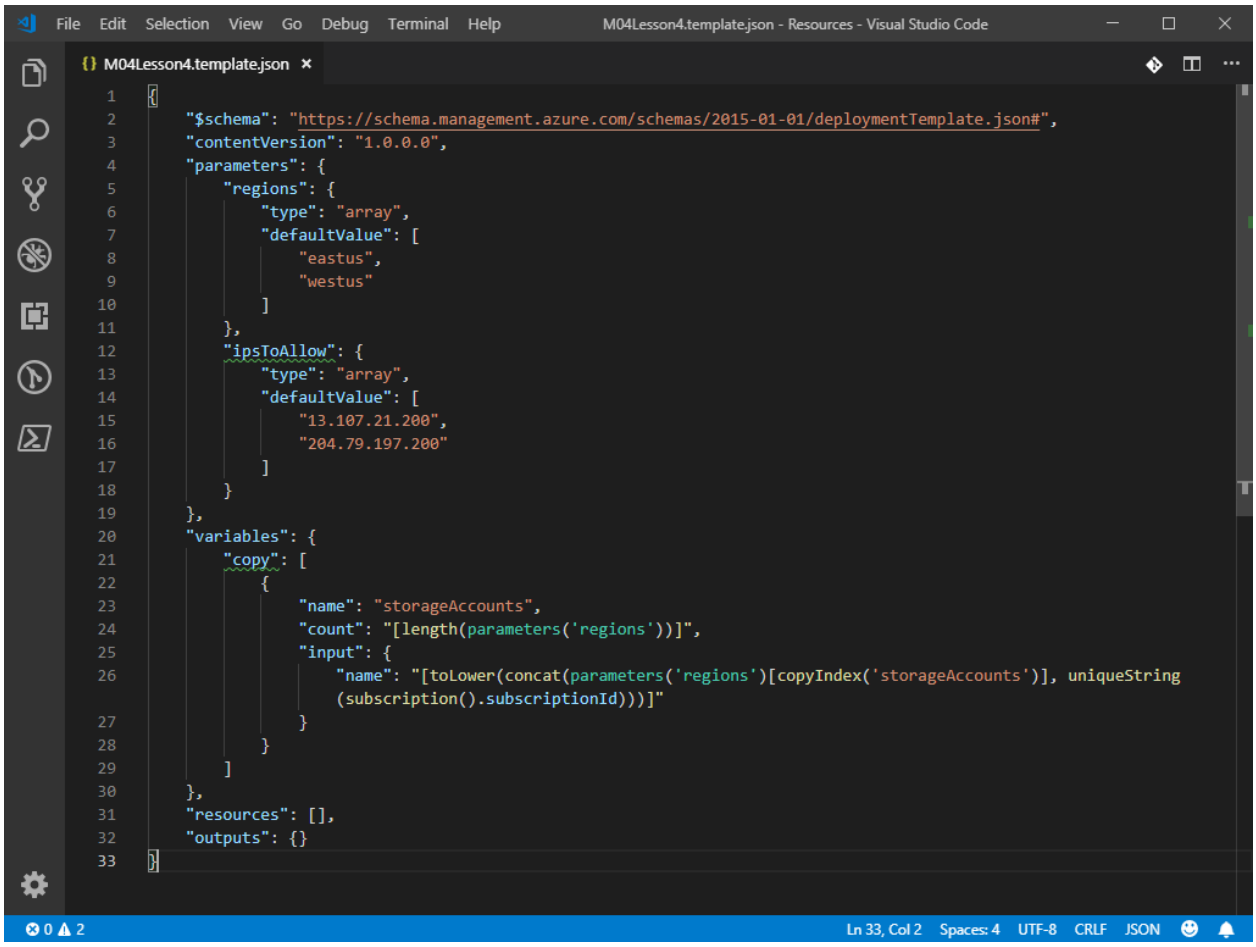
   i. This will be the name of the variable array created by the copy

b. `"count": "[length(parameters('regions'))]"`

6. Below the `"count"` property, add an `"input": {}` object

7. Inside the `"input": {}` object, add the following

   a. `"name": "[toLower(concat(parameters('regions')[copyIndex('storageAccounts')], uniqueString(subscription().subscriptionId)))]"`



Add a storage resource to the ARM template

1. Add a storage account resource to the `"resources": []` section. This will be done manually, without using a snippet

2. Move your cursor in between the `[]` brackets on the line containing `"resources": [],` and press `Enter` to create a new line

3. Add a new object by typing `{}`. With your curser between the `{}`, press `Enter` to create a new line

4. Inside the `{}` object, add the following

    a. `"type": "Microsoft.Storage/storageAccounts"`
    b. `"apiVersion": "2018-07-01"`
    c. `"name": "[variables('storageAccounts')[copyIndex()].name]"`
        i. **NOTE:** VS Code IntelliSense will throw errors on this value because it cannot verify the variable name from a variable iteration copy loop.
    d. `"location": "[parameters('regions')[copyIndex()]]"`
    e. `"kind": "StorageV2"`

5. Notice how the `name` and `location` properties are pulling values from an array using an index

6. Below the `location` property, add a resource iteration copy loop by typing `"copy": {}`. With your curser between the `{}`, press `Enter` to create a new line

7. Inside the `"copy": {}` object, add the following

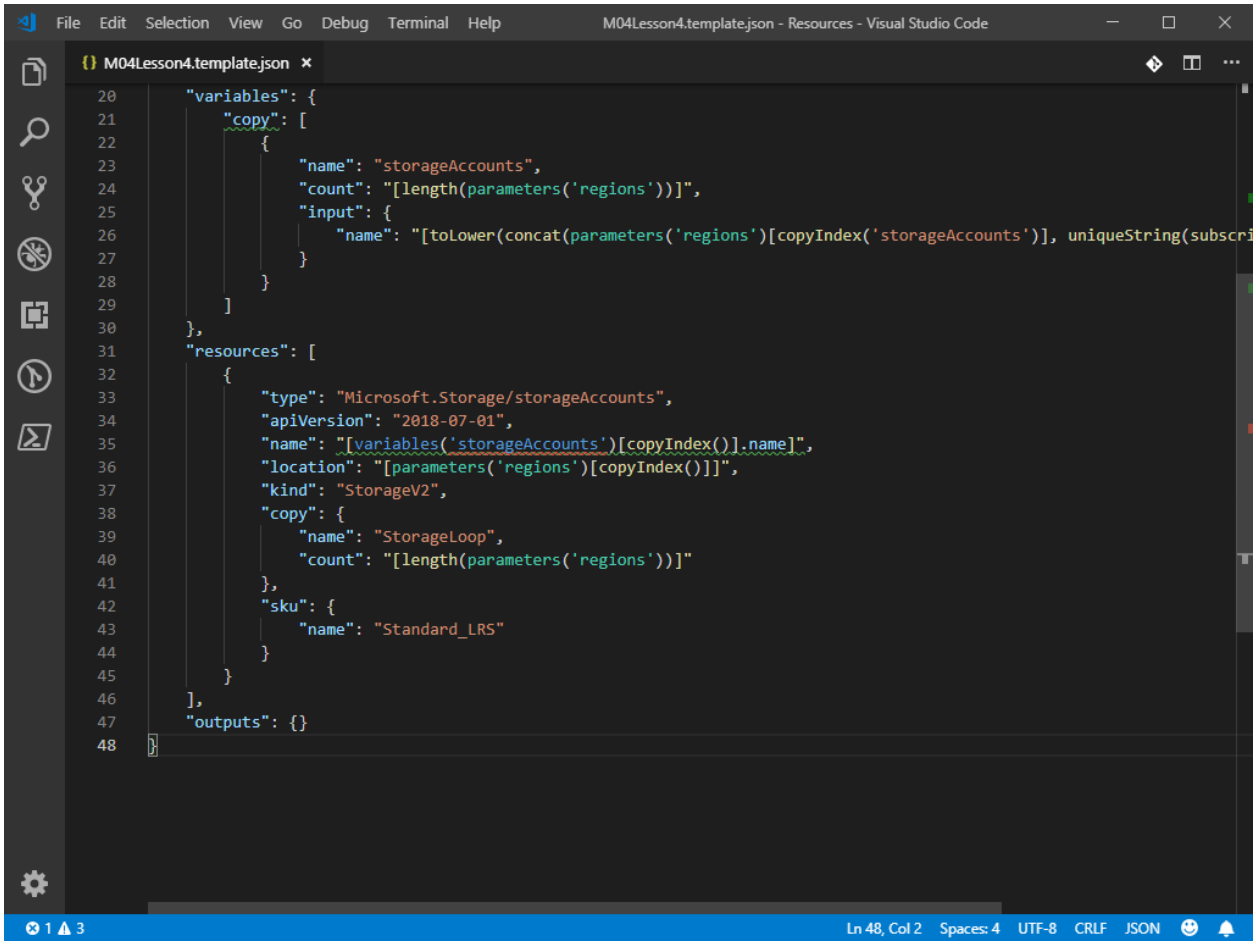
    a. `"name": "StorageLoop"`
        i. **NOTE:** This name will be used for a dependency for another resource
    b. `"count": "[length(parameters('regions'))]"`

8. Below the `"copy": {}` object, add a `"sku": {}` object. With your curser between the `{}`, press `Enter` to create a new line

9. Inside the `"sku": {}` object, add the following

    a. `"name": "Standard_LRS"`

10. At this point, your resource should look as follows



11. Below the `"sku": {}` object, add a `"properties": {}` object. With your curser between the `{}`, press `Enter` to create a new line

12. Inside the `"properties": {}` object, add a `"networkAcls": {}` object. With your curser between the `{}`, press `Enter` to create a new line

13. Inside the `"networkAcls": {}` object, add the following

    a. `"defaultAction": "Deny"`

14. Below the `defaultAction` property, add a property iteration copy loop by typing `"copy": []`. With your curser between the `[]`, press `Enter` to create a new line

15. Add a new object by typing `{}`. With your curser between the `{}`, press `Enter` to create a new line

16. Inside the `{}` object, add the following

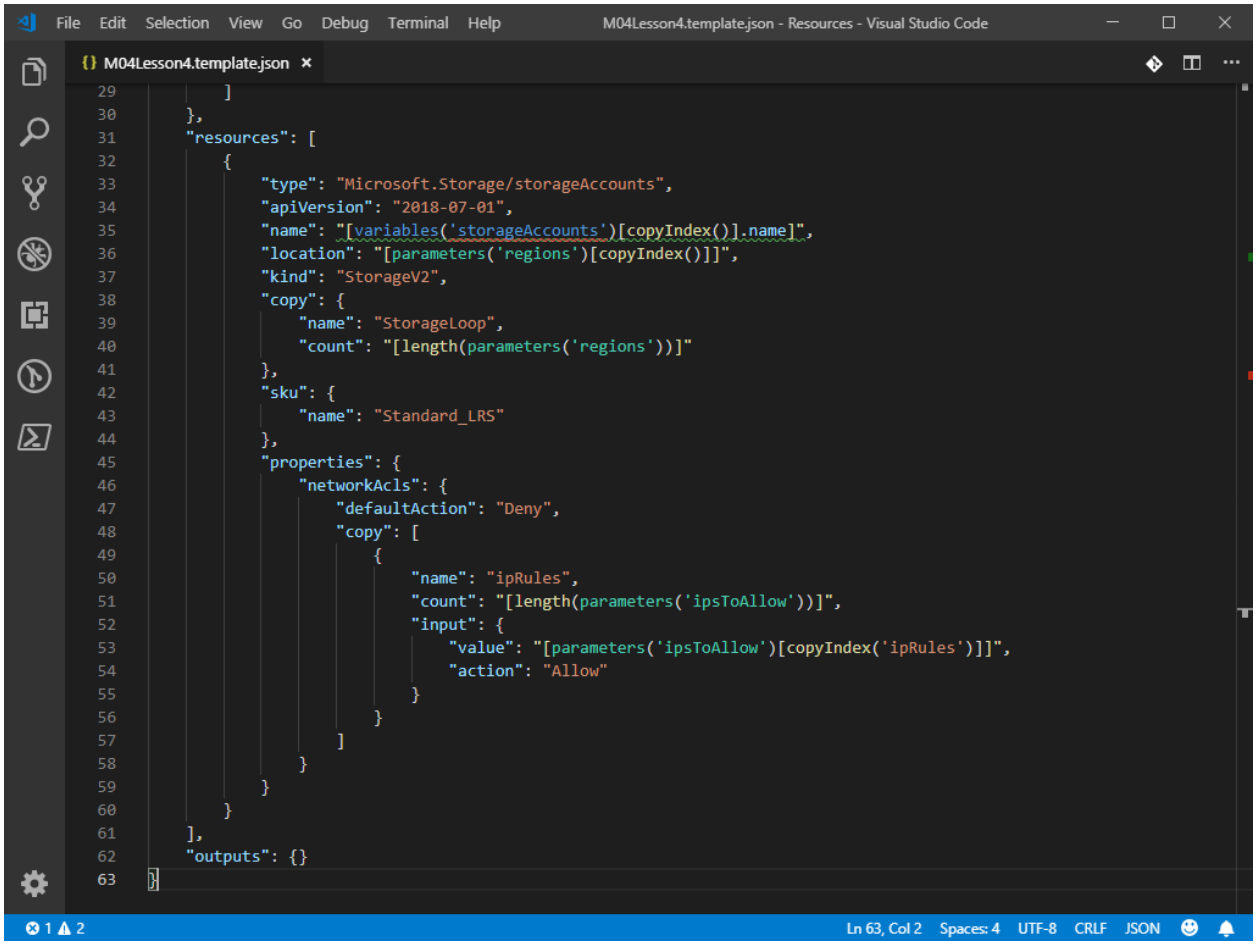
    a. `"name": "ipRules"`
    b. `"count": "[length(parameters('ipsToAllow'))]"`

17. Below the `"count"` property, add an `"input": {}` object

18. Inside the `"input": {}` object, add the following

    a. `"value": "[parameters('ipsToAllow')[copyIndex('ipRules')]]"`

b. `"action": "Allow"`



Add a blob container child resource to the ARM template

1. You will now add a blob container resource to the template. This is called a child resource, with the parent resource being the storage account.

2. Below the `Microsoft.Storage/storageAccounts` object, add a new object by typing `{}`. With your curser between the `{}`, press `Enter` to create a new line

3. Inside the `{}` object, add the following

    a. `"type": "Microsoft.Storage/storageAccounts/blobServices/containers"`

    b. `"apiVersion": "2018-07-01"`

    c. `"name": "[concat(variables('storageAccounts')[copyIndex()].name, '/default/container1')]"`

        i. Notice how the blob container name must reference the parent storage account resource

4. Below the `name` property, add a resource iteration copy loop by typing `"copy": {}`. With your curser between the `{}`, press `Enter` to create a new line

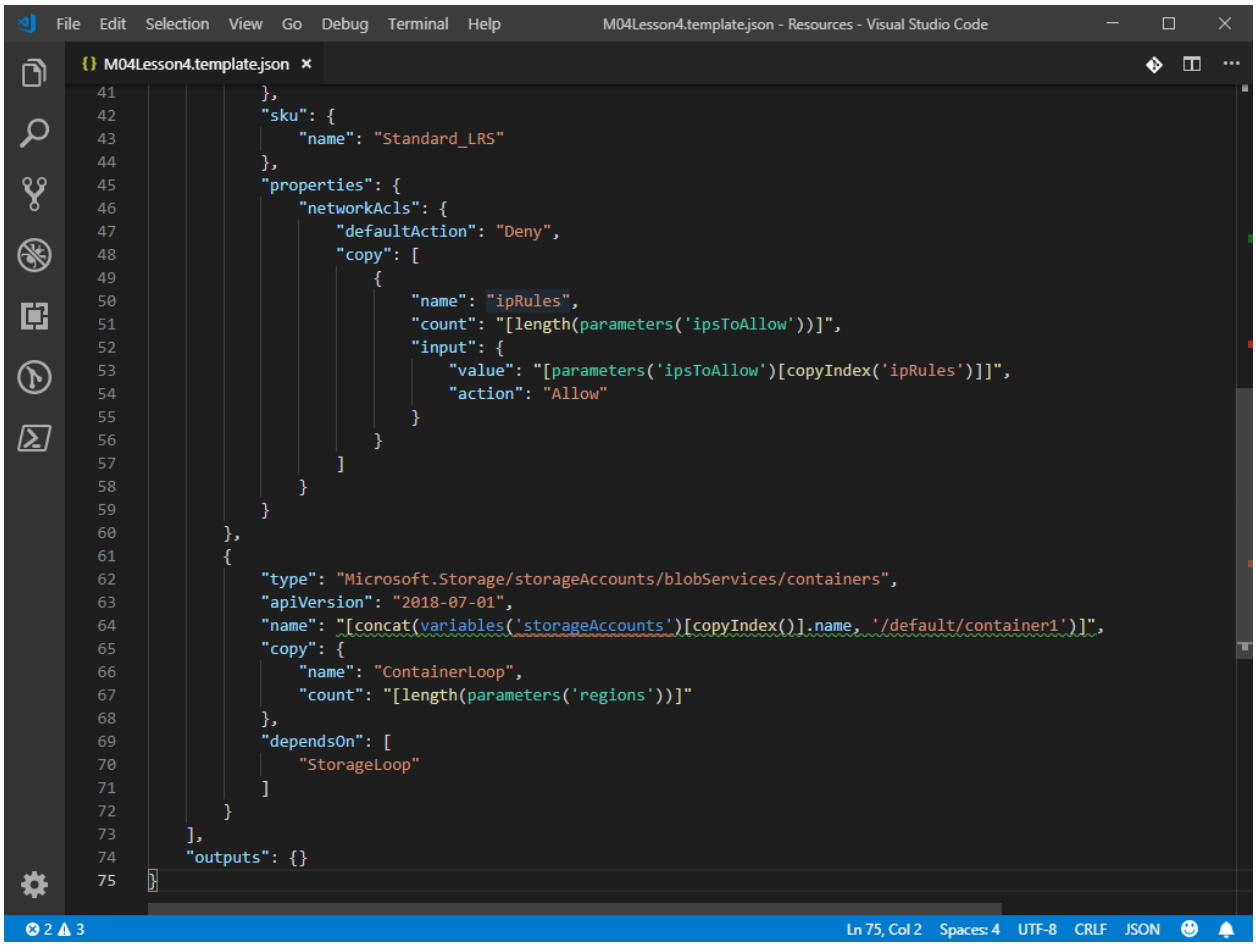
5. Inside the `"copy": {}` object, add the following

a. `"name": "ContainerLoop"`
b. `"count": "[length(parameters('regions'))]"`

6. Below the `"copy": {}` object, add a `"dependsOn": []` array. With your curser between the `[]`, press `Enter` to create a new line
7. Inside the `"dependsOn": []` array, add the following

a. `"StorageLoop"`

i. Notice how this reference the copy loop name from the storage account resource iteration instead of a named resource



Deploy the ARM template file

1. Open PowerShell in `C:\Lab_Files\M04\S04`
2. Authenticate PowerShell to Azure by running `Connect-AzAccount` as T {USERNAME} using T {PASSWORD} as the password.
3. Run the following PowerShell commands to deploy the template

PowerShell

```
Set-AzContext -Subscription '{SUBSCRIPTION_ID}'
```

```
New-AzResourceGroupDeployment -Name 'M04Lesson4' -ResourceGroupName '{RESOURCE_G
```

Because both parameters have default values, you do not need to defined a parameter file. If you would like to override these values, please create a coordinating ARM parameter file. See the lab for Module 4 Lesson 2 for details on creating this file. If using a parameters file, use the command below

```
PowerShell
New-AzResourceGroupDeployment -Name 'M04Lesson4' -ResourceGroupName '{RESOURCE_GRO
```

Inspect the deployed Storage Account

1. Open the Azure Portal as T {USERNAME} using T {PASSWORD} as the password.
2. Navigate to the resource group `{RESOURCE_GROUP_NAME}`
3. There should be one storage account per region defined in the `regions` parameter array
4. Open one of the storage accounts
5. Inside the `Firewalls and virtual networks` blade, there should be an entry for each public IP defined in the `ipsToAllow` parameter array
6. Inside the `Blobs` blade, there should be a container named container1
7. Review the other storage accounts deployed. Their properties should match with the exception of being deployed to a different region