Index

6.	21/04/2022	Working with Circle CI for continuous integration	20	
7.	22/04/2022	Working with Team Service	32	

Practical No 1

Aim: Create a console based ASP.net core application.

Source Code:

Step 1:

- Download the asp.net core sdk from https://dotnet.microsoft.com/learn/dotnet/hello-worldtutorial/install
- Install the asp.net core sdk.
- To check whether the asp.net sdk is successful install, open command prompt and type command: **dotnet**

```
C:\Users\Shraddha Shah>dotnet

Usage: dotnet [options]
Usage: dotnet [path-to-application]

Options:
  -h|--help         Display help.
  --info            Display .NET information.
  --list-sdks       Display the installed SDKs.
  --list-runtimes   Display the installed runtimes.

path-to-application:
  The path to an application .dll file to execute.

C:\Users\Shraddha Shah>
```

- To check the version of the dotnet

```
C:\Users\Shraddha Shah>dotnet --version
6.0.202
```

Step 2:

- Go to the drive where you want to create the console application. Create a folder in the drive and go to that folder. Type the following command in the command prompt to create the application.

```
D:\MSA Pracs\prac1>cd..

D:\MSA Pracs>md HelloWorld

D:\MSA Pracs>cd Hell*

D:\MSA Pracs\HelloWorld>dotnet new console
The template "Console App" was created successfully.

Processing post-creation actions...
Running 'dotnet restore' on D:\MSA Pracs\HelloWorld\HelloWorld.csproj...
  Determining projects to restore...
  Restored D:\MSA Pracs\HelloWorld\HelloWorld.csproj (in 63 ms).
Restore succeeded.
```

- Restore the project and run the application

```
D:\MSA Pracs>cd hell*

D:\MSA Pracs\HelloWorld>dotnet restore
  Determining projects to restore...
  Restored D:\MSA Pracs\HelloWorld\HelloWorld.csproj (in 25.91 sec).

D:\MSA Pracs\HelloWorld>dotnet run
Hello, World!
```

Step 3:

- Now open **HelloWorld.csproj** file, edit the code

```
<Project Sdk="Microsoft.NET.Sdk">
        <PropertyGroup>
              <OutputType>Exe</OutputType>
              <TargetFramework>net6.0</TargetFramework>
              <ImplicitUsings>enable</ImplicitUsings>
              <Nullable>enable</Nullable>
      </PropertyGroup>
      <ItemGroup>
              <PackageReference Include="Microsoft.AspNetCore.Mvc"
      Version="1.1.1"/>
              <PackageReference
      Include="Microsoft.AspNetCore.Server.Kestrel" Version="1.1.1"/>
              <PackageReference Include="Microsoft.Extensions.Logging"
      Version="1.1.1"/>
              <PackageReference
      Include="Microsoft.Extensions.Logging.Console"
      Version="1.1.1"/>
              <PackageReference
      Include="Microsoft.Extensions.Logging.Debug" Version="1.1.1"/>
              <PackageReference
      Include="Microsoft.Extensions.Configuration.CommandLine"
      Version="1.1.1"/>
      </ItemGroup>
</Project>
```

- Open Program.cs file and edit the code

```
using System;
using Microsoft.AspNetCore.Builder;
using Microsoft.AspNetCore.Hosting;
using Microsoft.Extensions.Logging;
using Microsoft.AspNetCore.Http;
using Microsoft.Extensions.Configuration;
namespace HelloWorld // Note: actual namespace depends on the project
name.
{
      internal class Program
      {
                    static void Main(string[] args)
            {
                    var config = new ConfigurationBuilder()
                              .AddCommandLine(args)
                              .Build();
                    var host = new WebHostBuilder()
                            .UseKestrel()
                            .UseStartup<Startup>()
                            .UseConfiguration(config)
                            .Build();
                    host.Run();
            }
      }
      public class Startup
      {
            public Startup(IHostingEnvironment env) { }
            public void Configure(IApplicationBuilder app,
      IHostingEnvironment env, ILoggerFactory loggerFactory)
            {
```

```
                app.Run(async (context) => { await
            context.Response.WriteAsync("Hello, world!");});
            }
        }
    }
```

Step 4:

Restore the project.

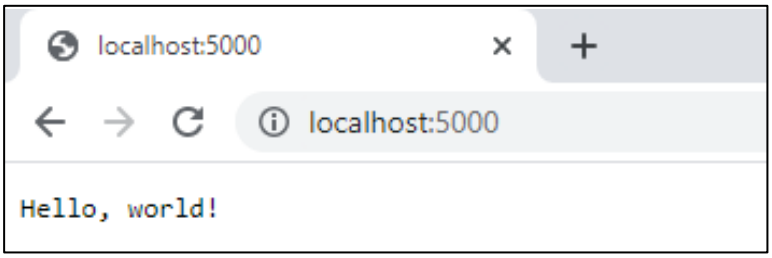
```
D:\MSA Pracs\HelloWorld>dotnet restore
  Determining projects to restore...
  All projects are up-to-date for restore.
```

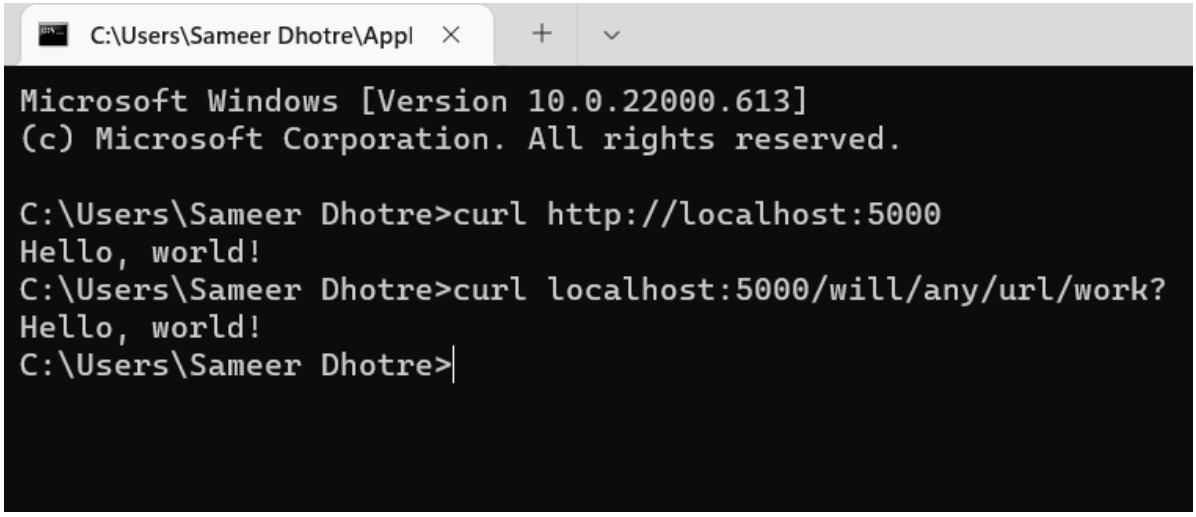
Output:

Run the application

```
D:\MSA Pracs\HelloWorld>dotnet run
Hosting environment: Production
Content root path: D:\MSA Pracs\HelloWorld\bin\Debug\net6.0\
Now listening on: http://localhost:5000
Application started. Press Ctrl+C to shut down.
Application is shutting down...
```

Now open the browser open the url: http://localhost:5000





Practical No 2

Aim: Create a MVC Project in ASP.net core

Source Code:

Step 1:

Create a mvc project

dotnet new mvc –auth none

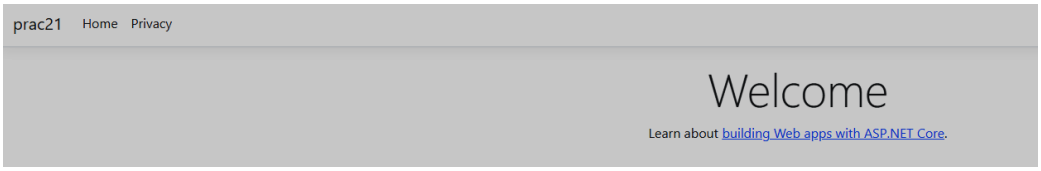
```
D:\Microservices Architecture\Practice Practical\Practs\pracs2>dotnet new mvc --auth none
The template "ASP.NET Core Web App (Model-View-Controller)" was created successfully.
This template contains technologies from parties other than Microsoft, see https://aka.ms/aspnetcore/6.0-third-party-not
ices for details.

Processing post-creation actions...
Running 'dotnet restore' on D:\Microservices Architecture\Practice Practical\Practs\pracs2\pracs2.csproj...
  Determining projects to restore...
  Restored D:\Microservices Architecture\Practice Practical\Practs\pracs2\pracs2.csproj (in 278 ms).
Restore succeeded.


D:\Microservices Architecture\Practice Practical\Practs\pracs2>
```

Step 2:

Restore, build and run the program.

Use the first url of the command prompt in the browser and see theoutput

```
D:\Microservices Architecture\Practice Practical\Practs\pracs2>dotnet build
Microsoft (R) Build Engine version 17.1.1+a02f73656 for .NET
Copyright (C) Microsoft Corporation. All rights reserved.

  Determining projects to restore...
  All projects are up-to-date for restore.
  pracs2 -> D:\Microservices Architecture\Practice Practical\Practs\pracs2\bin\Debug\net6.0\pracs2.dll

Build succeeded.
    0 Warning(s)
    0 Error(s)

Time Elapsed 00:00:04.72

D:\Microservices Architecture\Practice Practical\Practs\pracs2>dotnet run
Building...
info: Microsoft.Hosting.Lifetime[14]
      Now listening on: https://localhost:7091
info: Microsoft.Hosting.Lifetime[14]
      Now listening on: http://localhost:5103
info: Microsoft.Hosting.Lifetime[0]
      Application started. Press Ctrl+C to shut down.
info: Microsoft.Hosting.Lifetime[0]
      Hosting environment: Development
info: Microsoft.Hosting.Lifetime[0]
      Content root path: D:\Microservices Architecture\Practice Practical\Practs\pracs2\
```



Step 3:

Go to Models Folder and create StockQuote.cs file in it.

```
using System;
namespace pracs.Models
{
	public class StockQuote
	{
		public string Symbol {get;set;}
		public int Price{get;set;}
	}
}
```

Step 4:

Now go to views folder and then in home folder. Edit the index.cshtml file

```
@{
    ViewData["Title"] = "Home Page";
}

<div class="text-center">
    <h1 class="display-4">Welcome</h1>
    Symbol: @Model.Symbol <br/>
      Price: $@Model.Price <br/>
</div>
```

Step 5:

Now go to controller folder and edit HomeController.cs

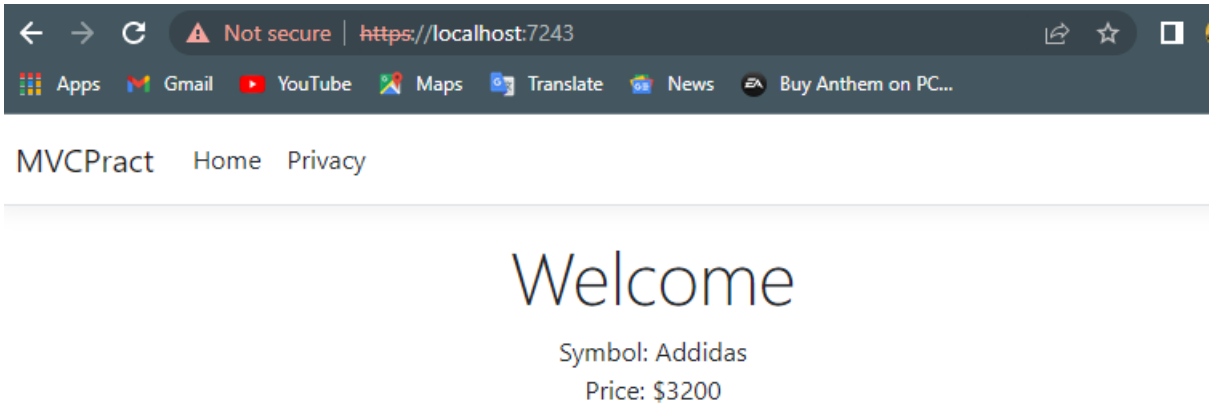
```
using System;
using System.Collections.Generic;
using System.Diagnostics;
using System.Linq;
using System.Threading.Tasks;
using Microsoft.AspNetCore.Mvc;
using Microsoft.Extensions.Logging;
using pracs2.Models;

namespace pracs2.Controllers;

public class HomeController : Controller
{
    public async Task <IActionResult> Index()
      {
		var model= new StockQuote{ Symbol="Nike", Price=3200};
		return View(model);
      }
}
```

Step 6:

```
D:\Microservices Architecture\Practice Practical\Practs\pracs2>dotnet build
Microsoft (R) Build Engine version 17.1.1+a02f73656 for .NET
Copyright (C) Microsoft Corporation. All rights reserved.

  Determining projects to restore...
  All projects are up-to-date for restore.
  pracs2 -> D:\Microservices Architecture\Practice Practical\Practs\pracs2\bin\Debug\net6.0\pracs2.dll

Build succeeded.
    0 Warning(s)
    0 Error(s)

Time Elapsed 00:00:04.31

D:\Microservices Architecture\Practice Practical\Practs\pracs2>dotnet run
Building...
info: Microsoft.Hosting.Lifetime[14]
      Now listening on: https://localhost:7091
info: Microsoft.Hosting.Lifetime[14]
      Now listening on: http://localhost:5103
info: Microsoft.Hosting.Lifetime[0]
      Application started. Press Ctrl+C to shut down.
info: Microsoft.Hosting.Lifetime[0]
      Hosting environment: Development
info: Microsoft.Hosting.Lifetime[0]
      Content root path: D:\Microservices Architecture\Practice Practical\Practs\pracs2\
```

Output:

Open the first url in the browser and see the output



Practical No 3

Aim: Usage of Docker Desktop

Commands & its output:

Open command prompt

- To check whether docker is installed properly
  `$ docker`

```
D:\msa>docker

Usage:  docker [OPTIONS] COMMAND

A self-sufficient runtime for containers

Options:
      --config string      Location of client config files (default
                           "C:\\Users\\Admin\\.docker")
  -c, --context string     Name of the context to use to connect to the
                           daemon (overrides DOCKER_HOST env var and
                           default context set with "docker context use")
  -D, --debug              Enable debug mode
  -H, --host list          Daemon socket(s) to connect to
  -l, --log-level string   Set the logging level
                           ("debug"|"info"|"warn"|"error"|"fatal")
                           (default "info")
      --tls                Use TLS; implied by --tlsverify
      --tlscacert string   Trust certs signed only by this CA (default
                           "C:\\Users\\Admin\\.docker\\ca.pem")
      --tlscert string     Path to TLS certificate file (default
                           "C:\\Users\\Admin\\.docker\\cert.pem")
      --tlskey string      Path to TLS key file (default
                           "C:\\Users\\Admin\\.docker\\key.pem")
      --tlsverify          Use TLS and verify the remote
  -v, --version            Print version information and quit

Management Commands:
  builder     Manage builds
  buildx*     Docker Buildx (Docker Inc., v0.8.2)
  compose*    Docker Compose (Docker Inc., v2.4.1)
  config      Manage Docker configs
  container   Manage containers
  context     Manage contexts
  image       Manage images
  manifest    Manage Docker image manifests and manifest lists
  network     Manage networks
  node        Manage Swarm nodes
  plugin      Manage plugins
  sbom*       View the packaged-based Software Bill Of Materials (SBOM) for an image (Anchore Inc., 0.6.0)
  scan*       Docker Scan (Docker Inc., v0.17.0)
  secret      Manage Docker secrets
  service     Manage services
  stack       Manage Docker stacks
  swarm       Manage Swarm
  system      Manage Docker
  trust       Manage trust on Docker images
  volume      Manage volumes
```

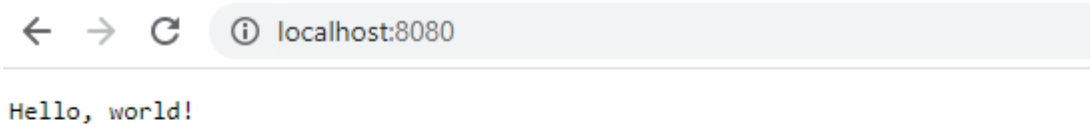
- To see the version of the docker
  `$ docker -v`

```
D:\msa>docker -v
Docker version 20.10.14, build a224086

D:\msa>_
```

- To run hello-world image
  `$ docker run -p 8080:8080 dotnetcoreservices/hello-world`

```
D:\msa>docker run -p 8080:8080 dotnetcoreservices/hello-world
Hosting environment: Production
Content root path: /pipeline/source/app/publish
Now listening on: http://0.0.0.0:8080
Application started. Press Ctrl+C to shut down.
```

- Run localhost in the browser
  `http://localhost:8080`




```
Hello, world!
```

- To see the output in the command prompt
  `$ curl http://localhost:8080/will/it/blend?`

Command Prompt

```
Microsoft Windows [Version 10.0.19044.1706]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Admin>curl http://localhost:8080/will/it/blend?
Hello, world!

C:\Users\Admin>
```

- To see the images in the docker
  `$ docker ps`

```
C:\Users\Admin>docker ps
CONTAINER ID   IMAGE                                  COMMAND                  CREATED        STATUS         PORTS                    NAMES
15c840e18b74   dotnetcoreservices/hello-world         "/pipeline/source/ap…"   3 minutes ago  Up 3 minutes   0.0.0.0:8080->8080/tcp   thirsty_mendeleev
19e44394ce14   8c2c38aa676e                           "/kube-vpnkit-forwar…"   6 minutes ago  Up 6 minutes                            k8s_vpnkit-controller_vpnkit-controller_kube-system_3b9c1da2-6cd8-4f58-9994-292c60ec1c30_40
cf2b29cf594c   99f89471f470                           "/storage-provisione…"   7 hours ago    Up 7 hours                              k8s_storage-provisioner_storage-provisioner_kube-system_026bff3b-ff08-427e-9070-335e41f0a842_4
12d554ff9013   8d147537fb7d                           "/coredns -conf /etc…"   7 hours ago    Up 7 hours                              k8s_coredns_coredns-78fcd69978-sc49b_kube-system_5bf26f98-4b52-4e5b-8dbf-ee5adca62771_2
430216e1dc87   8d147537fb7d                           "/coredns -conf /etc…"   7 hours ago    Up 7 hours                              k8s_coredns_coredns-78fcd69978-xhwmz_kube-system_6f19c380-8277-4bae-a972-7a1856305d19_2
232bfe28f62b   8f8fdd6672d4                           "/usr/local/bin/kube…"   7 hours ago    Up 7 hours                              k8s_kube-proxy_kube-proxy-2494n_kube-system_b1ba30bc-f010-47d6-9e15-c92d1cfd1d21_2
185f06a670e7   k8s.gcr.io/pause:3.5                   "/pause"                 7 hours ago    Up 7 hours                              k8s_POD_storage-provisioner_kube-system_026bff3b-ff08-427e-9070-335e41f0a842_2
094ffbf4d103   k8s.gcr.io/pause:3.5                   "/pause"                 7 hours ago    Up 7 hours                              k8s_POD_coredns-78fcd69978-xhwmz_kube-system_6f19c380-8277-4bae-a972-7a1856305d19_2
f38718d95ce1   k8s.gcr.io/pause:3.5                   "/pause"                 7 hours ago    Up 7 hours                              k8s_POD_vpnkit-controller_kube-system_3b9c1da2-6cd8-4f58-9994-292c60ec1c30_2
7c3be6de03ca   k8s.gcr.io/pause:3.5                   "/pause"                 7 hours ago    Up 7 hours                              k8s_POD_coredns-78fcd69978-sc49b_kube-system_5bf26f98-4b52-4e5b-8dbf-ee5adca62771_2
64da36c8a371   k8s.gcr.io/pause:3.5                   "/pause"                 7 hours ago    Up 7 hours                              k8s_POD_kube-proxy-2494n_kube-system_b1ba30bc-f010-47d6-9e15-c92d1cfd1d21_2
81b781a4a6bd   004811815584                           "etcd --advertise-cl…"   7 hours ago    Up 7 hours                              k8s_etcd_etcd-docker-desktop_kube-system_e5422d6ad44165160915 3d62d1ad42f6_2
fa53e5984047   059e6cd8cf78                           "kube-apiserver --ad…"   7 hours ago    Up 7 hours                              k8s_kube-apiserver_kube-apiserver-docker-desktop_kube-system_3ca039f7ff0c547d271c37587418b712_2
08a2fd1e5e54   04185bc88e08                           "kube-controller-man…"   7 hours ago    Up 7 hours                              k8s_kube-controller-manager_kube-controller-manager-docker-desktop_kube-system_1fe1f00ef31eb1efe8731cc2f5b77
6aa_3
afb2029ccfea   935d8fdc2d52                           "kube-scheduler --au…"   7 hours ago    Up 7 hours                              k8s_kube-scheduler_kube-scheduler-docker-desktop_kube-system_d19d89767cc69ae3010bc658c1cd2e46_2
9efb5414ae3B   k8s.gcr.io/pause:3.5                   "/pause"                 7 hours ago    Up 7 hours                              k8s_POD_etcd-docker-desktop_kube-system_e5422d6ad44165160915 3d62d1ad42f6_2
66ddfbac9d10   k8s.gcr.io/pause:3.5                   "/pause"                 7 hours ago    Up 7 hours                              k8s_POD_kube-apiserver-docker-desktop_kube-system_3ca039f7ff0c547d271c37587418b712_2
c1d12156b6a2   k8s.gcr.io/pause:3.5                   "/pause"                 7 hours ago    Up 7 hours                              k8s_POD_kube-controller-manager-docker-desktop_kube-system_1fe1f00ef31eb1efe8731cc2f5b776aa_2
5ce6bf1169eb   k8s.gcr.io/pause:3.5                   "/pause"                 7 hours ago    Up 7 hours                              k8s_POD_kube-scheduler-docker-desktop_kube-system_d19d89767cc69ae3010bc658c1cd2e46_2
```

- To terminate the image in the docker.
  note the container id of the docker that you want to terminal and replace the <Containerid> in the below command
  `$ docker kill <containerid>`

```
C:\Users\Admin>docker kill 35c840e18b74
35c840e18b74
```

To check whether the docker is terminated or not
`$ docker ps`

```
C:\Users\Admin>docker ps
CONTAINER ID   IMAGE                  COMMAND                  CREATED              STATUS              PORTS     NAMES
675693bab0bb   8c2c38aa676e           "/kube-vpnkit-forwar…"   About a minute ago   Up About a minute               k8s_vpnkit-controller_vpnkit-controller_kube-system_3b9c1da2-6cd8-4f58-9994-292c60ec1c30_41
cf2b29cf594c   99f89471f470           "/storage-provisione…"   7 hours ago          Up 7 hours                      k8s_storage-provisioner_storage-provisioner_kube-system_026bff3b-ff08-427e-9070-335e41f0a842_4
12d54ff9013    8d147537fb7d           "/coredns -conf /etc…"   7 hours ago          Up 7 hours                      k8s_coredns_coredns-78fcd69978-sc49b_kube-system_5bf26f98-4b52-4e5b-8dbf-ee5adca62771_2
430216e1dc87   8d147537fb7d           "/coredns -conf /etc…"   7 hours ago          Up 7 hours                      k8s_coredns_coredns-78fcd69978-xhwnz_kube-system_6f19c380-8277-4bae-a972-7a1856305d19_2
2328fe28f628   8f8fdd6672d4           "/usr/local/bin/kube…"   7 hours ago          Up 7 hours                      k8s_kube-proxy_kube-proxy-2494n_kube-system_b1ba30bc-f010-47d6-9e15-c92d1cfd1d21_2
185f06a670e7   k8s.gcr.io/pause:3.5   "/pause"                 7 hours ago          Up 7 hours                      k8s_POD_storage-provisioner_kube-system_026bff3b-ff08-427e-9070-335e41f0a842_2
094ffbf4d103   k8s.gcr.io/pause:3.5   "/pause"                 7 hours ago          Up 7 hours                      k8s_POD_coredns-78fcd69978-xhwnz_kube-system_6f19c380-8277-4bae-a972-7a1856305d19_2
f38718d95ce1   k8s.gcr.io/pause:3.5   "/pause"                 7 hours ago          Up 7 hours                      k8s_POD_vpnkit-controller_kube-system_3b9c1da2-6cd8-4f58-9994-292c60ec1c30_2
7c3be6de03ca   k8s.gcr.io/pause:3.5   "/pause"                 7 hours ago          Up 7 hours                      k8s_POD_coredns-78fcd69978-sc49b_kube-system_5bf26f98-4b52-4e5b-8dbf-ee5adca62771_2
64da36c8a371   k8s.gcr.io/pause:3.5   "/pause"                 7 hours ago          Up 7 hours                      k8s_POD_kube-proxy-2494n_kube-system_b1ba30bc-f010-47d6-9e15-c92d1cfd1d21_2
01b781a4a6bd   004811815584           "etcd --advertise-cl…"   7 hours ago          Up 7 hours                      k8s_etcd_etcd-docker-desktop_kube-system_e5422d6ad4416516091 53d62d1ad42f6_2
fa53e5984047   059e6cd8cf78           "kube-apiserver --ad…"   7 hours ago          Up 7 hours                      k8s_kube-apiserver_kube-apiserver-docker-desktop_kube-system_3ca039f7ff0c547d271c37587418b712_2
00a2fd1e5e54   04185bc88e08           "kube-controller-man…"   7 hours ago          Up 7 hours                      k8s_kube-controller-manager_kube-controller-manager-docker-desktop_kube-system_1fe1f00ef31eb1efe8731cc2f5b776aa_3
afb2029ccfea   93508fdc2d52           "kube-scheduler --au…"   7 hours ago          Up 7 hours                      k8s_kube-scheduler_kube-scheduler-docker-desktop_kube-system_d19d89767cc69ae3010bc658c1cd2e46_2
3efb5414ae38   k8s.gcr.io/pause:3.5   "/pause"                 7 hours ago          Up 7 hours                      k8s_POD_etcd-docker-desktop_kube-system_e5422d6ad4416516091 53d62d1ad42f6_2
66ddfbac9d10   k8s.gcr.io/pause:3.5   "/pause"                 7 hours ago          Up 7 hours                      k8s_POD_kube-apiserver-docker-desktop_kube-system_3ca039f7ff0c547d271c37587418b712_2
c1d12156b6a2   k8s.gcr.io/pause:3.5   "/pause"                 7 hours ago          Up 7 hours                      k8s_POD_kube-controller-manager-docker-desktop_kube-system_1fe1f00ef31eb1efe8731cc2f5b776aa_2
5ce0bf1169eb   k8s.gcr.io/pause:3.5   "/pause"                 7 hours ago          Up 7 hours                      k8s_POD_kube-scheduler-docker-desktop_kube-system_d19d89767cc69ae3010bc658c1cd2e46_2

C:\Users\Admin>
```

Practical No 4

Aim: Working with Docker

Commands and its output:

Step 1:

Create a account in the docker hub. Remember the username and password of the account

Step 2:

- Now to go https://labs.play-with-docker.com/ and click on **Start** button.
- Click on **Add New Instance**. You will see the editor open in the right pane. Give the commands in the editor

Step 3:

- To check the version of the docker
  `$ docker – version`

```
[node1] (local) root@192.168.0.18 ~
$ docker --version
Docker version 20.10.0, build 7287ab3
[node1] (local) root@192.168.0.18 ~
$
```

- To pull the readymade image
  `$ docker pull hello-world`

```
$ docker pull hello-world
Using default tag: latest
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:80f31da1ac7b312ba29d65080fddf797dd76acfb870e677f390d5acba9741b17
Status: Downloaded newer image for hello-world:latest
docker.io/library/hello-world:latest
[node1] (local) root@192.168.0.18 ~
```

- To check the images in docker
  `$ docker images`

```
$ docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
hello-world   latest    feb5d9fea6a5   7 months ago   13.3kB
[node1] (local) root@192.168.0.18 ~
```

Part 1: To pull and Push images in docker

Step 4:

- Open the new tab in the browser and login to hub.docker.com
- Click on **Repositories** and then click on **Create Repositories**
- Give the name of the repository as "**repo1**" and in description add "**My first repository**"
- Make visibility as **Private**
- And now click on **Create** button and check whether the repository is created or not.

Step 5:

- Now come to the https://labs.play-with-docker.com/ and give the following command
- Login into docker account

```
$ docker login -username= your_user_name
password:
```

```
[node1] (local) root@192.168.0.18 ~
$ docker login --username=vishwakarma1919
Password:
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
```

Note: Give your username and password that you have used to login to hub.docker.com

- To tag an image in docker

```
$ docker tag <image id> <username>/repo1: firsttry
```

```
[node1] (local) root@192.168.0.18 ~
$ docker tag feb5d9fea6a5 vishwakarma1919/repo1:firsttry
[node1] (local) root@192.168.0.18 ~
$
```

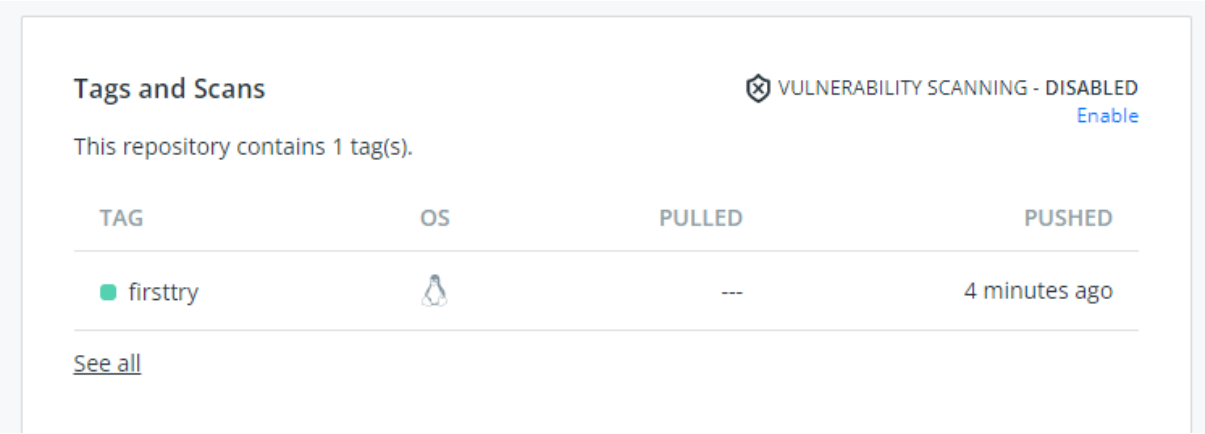
- To push the image to docker account

```
$ docker push <username>/repo1:firsttry
```

```
[node1] (local) root@192.168.0.18 ~
$ docker push vishwakarma1919/repo1:firsttry
The push refers to repository [docker.io/vishwakarma1919/repo1]
e07ee1baac5f: Mounted from library/hello-world
firsttry: digest: sha256:f54a58bc1aac5ea1a25d796ae155dc228b3f0e11d046ae276b39c4bf2f13d8c4 size: 525
[node1] (local) root@192.168.0.18 ~
$
```

Note: firsttry is tag name created above.

- Check it in hub.docker.com now in tags tab



Part 2: Build and image and then push and run in the docker

Step 6:

- In https://labs.play-with-docker.com/ give the following command

```
cat > Dockerfile <<EOF
FROM busybox
CMD echo "Hello world! This is my first Docker image."
EOF
```

```
[node1] (local) root@192.168.0.18 ~
$ cat> Dockerfile <<EOF
> FROM  busybox
> CMD echo "Hello World! This Is My First Docker Image."
> EOF
```

- To build the image from docker file

```
$ docker build -t <username>/repo2 .
```

```
[node1] (local) root@192.168.0.18 ~
$ docker build -t vishwakarma1919/repo2 .
Sending build context to Docker daemon     47MB
Step 1/2 : FROM  busybox
latest: Pulling from library/busybox
50e8d59317eb: Pull complete
Digest: sha256:d2b53584f580310186df7a2055ce3ff83cc0df6caacf1e3489bff8cf5d0af5d8
Status: Downloaded newer image for busybox:latest
 ---> 1a80408de790
Step 2/2 : CMD echo "Hello World! This Is My First Docker Image."
 ---> Running in 523badc76755
Removing intermediate container 523badc76755
 ---> 58a88ef19a6a
Successfully built 58a88ef19a6a
Successfully tagged vishwakarma1919/repo2:latest
[node1] (local) root@192.168.0.18 ~
$
```

- Check images in docker

```
$ docker images
```

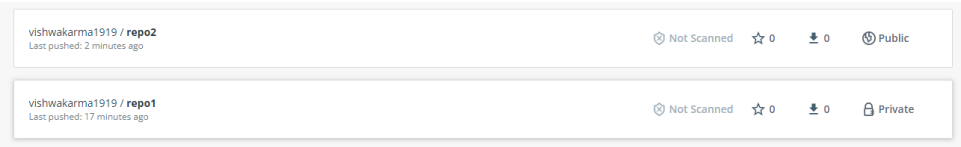
```
[node1] (local) root@192.168.0.18 ~
$ docker images
REPOSITORY              TAG         IMAGE ID       CREATED          SIZE
vishwakarma1919/repo2   latest      58a88ef19a6a   26 seconds ago   1.24MB
busybox                 latest      1a80408de790   4 weeks ago      1.24MB
hello-world             latest      feb5d9fea6a5   7 months ago     13.3kB
vishwakarma1919/repo1   firsttry    feb5d9fea6a5   7 months ago     13.3kB
[node1] (local) root@192.168.0.18 ~
$
```

- To push the image on the docker hub

```
$ docker push <username>/repo2.
```

```
[node2] (local) root@192.168.0.8 ~
$ docker push vishwakarma1919/repo2
Using default tag: latest
The push refers to repository [docker.io/vishwakarma1919/repo2]
eb6b01329ebe: Mounted from library/busybox
latest: digest: sha256:4452bb83a562a0ce6a5e1fa11159957b8ad3cc62dffb6ad14b60dd4e5dd29bf3 size: 527
```

- Check it in hub.docker.com now in tags tab



- Come back to the https://labs.play-with-docker.com/ and give the below command to run the docker image

```
$ docker run <username>/repo2
```

```
[node2] (local) root@192.168.0.8 ~
$ docker run vishwakarma1919/repo2
Hello world! This is My First Docker Image
[node2] (local) root@192.168.0.8 ~
$
```

- Close the session

Practical No 5

Aim: Building ASP.Net core REST API

Source Code:

Step 1: Create a webAPI

Open command prompt and give the command

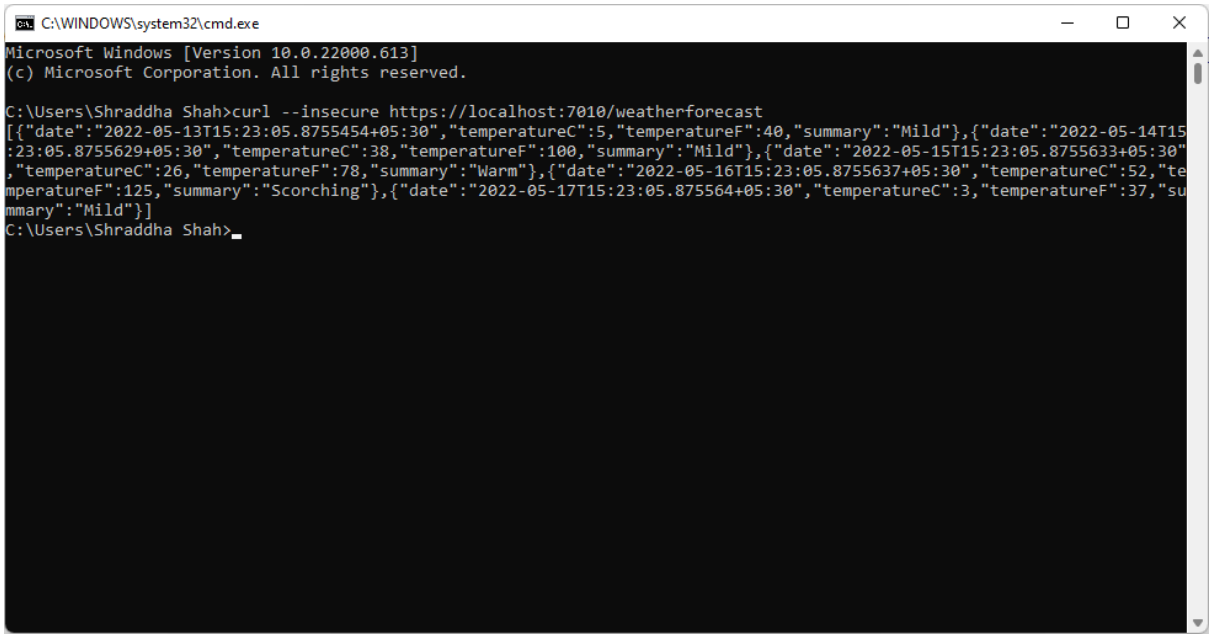
dotnet new webapi -o Glossary

```
C:\WINDOWS\system32\cmd.exe - dotnet new webapi -o Glossary
Microsoft Windows [Version 10.0.22000.613]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Shraddha Shah>d:

D:\>cd mic*

D:\Microservices Architecture>cd Practice*

D:\Microservices Architecture\Practice Practical>mkdir Prac3_demo

D:\Microservices Architecture\Practice Practical>cd Prac3_demo

D:\Microservices Architecture\Practice Practical\Prac3_demo>dotnet new webapi -o Glossary
The template "ASP.NET Core Web API" was created successfully.

Processing post-creation actions...
Running 'dotnet restore' on D:\Microservices Architecture\Practice Practical\Prac3_demo\Glossary\Glossary.csproj...
```

Now enter into the glossary folder and then run the project

```
C:\WINDOWS\system32\cmd.exe - dotnet run

D:\Microservices Architecture\Practice Practical>mkdir Prac3_demo

D:\Microservices Architecture\Practice Practical>cd Prac3_demo

D:\Microservices Architecture\Practice Practical\Prac3_demo>dotnet new webapi -o Glossary
The template "ASP.NET Core Web API" was created successfully.

Processing post-creation actions...
Running 'dotnet restore' on D:\Microservices Architecture\Practice Practical\Prac3_demo\Glossary\Glossary.csproj...
  Determining projects to restore...
  Restored D:\Microservices Architecture\Practice Practical\Prac3_demo\Glossary\Glossary.csproj (in 1.85 sec).
Restore succeeded.


D:\Microservices Architecture\Practice Practical\Prac3_demo>cd Glos*

D:\Microservices Architecture\Practice Practical\Prac3_demo\Glossary>dotnet run
Building...
info: Microsoft.Hosting.Lifetime[14]
      Now listening on: https://localhost:7010
info: Microsoft.Hosting.Lifetime[14]
      Now listening on: http://localhost:5058
info: Microsoft.Hosting.Lifetime[0]
      Application started. Press Ctrl+C to shut down.
info: Microsoft.Hosting.Lifetime[0]
      Hosting environment: Development
info: Microsoft.Hosting.Lifetime[0]
      Content root path: D:\Microservices Architecture\Practice Practical\Prac3_demo\Glossary\
```

Step 2: Open another command prompt & give curl command to view the output



Step 3: Delete the weatherforecast.cs from the Glossary Folder i.e root folder and also from the Controller Folder.

Step 4: Create a class file in the Glossary folder named "GlossaryItem.cs"

```
namespace Glossary
{
        public class GlossaryItem
        {
        public string Term { get; set;}
                public string Definition { get; set; }
        }
}
```

Step 5: Create a class file in the Controller folder named "GlossaryController.cs"

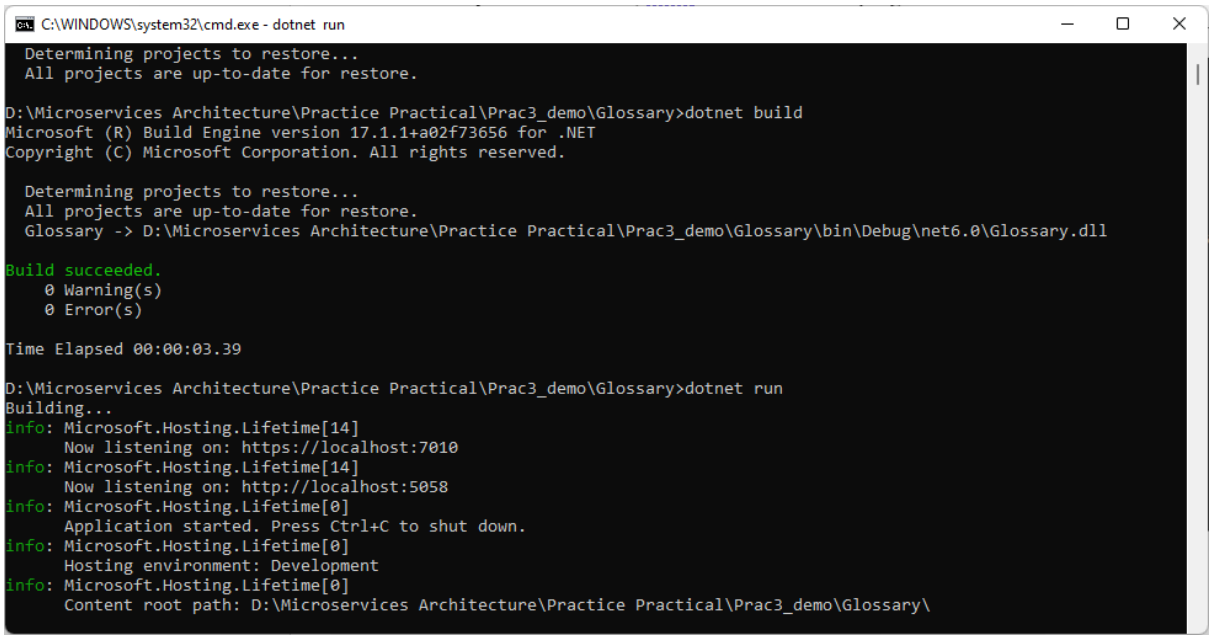
```
using System;
using System.Collections.Generic;
using Microsoft.AspNetCore.Mvc;
using System.IO;

namespace Glossary.Controllers;

[ApiController]
[Route ("api/[controller]")]

public class GlossaryController : ControllerBase
{
        private static List<GlossaryItem> Glossary = new List<GlossaryItem>
        {
                new GlossaryItem
                {
                        Term= "HTML",
                        Definition = "Hypertext Markup Language"
                },
                new GlossaryItem
                {
                        Term= "MVC",
                        Definition = "Model View Controller"
                },
                new GlossaryItem
                {
```

```
                        Term= "OpenID",
                        Definition = "An open standard for authentication"
                }
        };

    [HttpGet]
    public ActionResult<List<GlossaryItem>> Get()
        {
                return Ok(Glossary);
        }

        [HttpGet]
        [Route("{term}")]
        public ActionResult<GlossaryItem> Get(string term)
        {
                var glossaryItem = Glossary.Find(item =>
                item.Term.Equals(term,
StringComparison.InvariantCultureIgnoreCase));
                if (glossaryItem == null)
                {
                        return NotFound();
                } else
                {
                        return Ok(glossaryItem);
                }
        }

        [HttpPost]
        public ActionResult Post(GlossaryItem glossaryItem)
        {
                var existingGlossaryItem = Glossary.Find(item =>
                        item.Term.Equals(glossaryItem.Term,
StringComparison.InvariantCultureIgnoreCase));
                if (existingGlossaryItem != null)
                {
                        return Conflict("Cannot create the term because it
already exists.");
                }
                else
                {
                        Glossary.Add(glossaryItem);
                        var resourceUrl = Path.Combine(Request.Path.ToString(),
Uri.EscapeUriString(glossaryItem.Term));
                        return Created(resourceUrl, glossaryItem);
                }
        }

        [HttpPut]
        public ActionResult Put(GlossaryItem glossaryItem)
        {
                var existingGlossaryItem = Glossary.Find(item =>
                        item.Term.Equals(glossaryItem.Term,
StringComparison.InvariantCultureIgnoreCase));
                if (existingGlossaryItem == null)
                {
                        return BadRequest("Cannot update a nont existing
term.");
                } else
                {
                        existingGlossaryItem.Definition =
glossaryItem.Definition;
                        return Ok();
                }
```

```
        }

        [HttpDelete]
        [Route("{term}")]
        public ActionResult Delete(string term)
        {
                var glossaryItem = Glossary.Find(item =>
                        item.Term.Equals(term,
StringComparison.InvariantCultureIgnoreCase));
                if (glossaryItem == null)
                {
                        return NotFound();
                }
                else
                {
                        Glossary.Remove(glossaryItem);
                        return NoContent();
                }
        }
}
```

Step 6: To stop the application running on command prompt do Ctrl+c

Step 7: Now restore, build and then run the program



Output:

Open the other command prompt and give the following command.

Kindly note the port number that you will get in the previous command prompt and change the port number in the curl

1. Getting the List of Items
   curl --insecure https://localhost:7010/api/glossary

2. Getting Single Item
   a. curl --insecure https://localhost:7010/api/glossary/MVC

   b. curl --insecure https://localhost:7010/api/glossary/HTML

   c. curl --insecure https://localhost:7010/api/glossary/OpenID

3. Creating an item
   curl --insecure -X POST -d "{\"term\": \"MFA\", \"definition\":\"An authentication process.\"}" -H "Content-Type:application/json" https://localhost:7010/api/glossary

4. Updating an Item
   curl --insecure -X PUT -d "{\"term\": \"MVC\", \"definition\":\"Modified record of Model View Controller.\"}" -H "Content-Type:application/json" https://localhost:7010/api/glossary

5. Delete an Item
   curl --insecure --request DELETE --url https://localhost:7010/api/glossary/openid

Output:-

Open the other command prompt and give the following command.

Kindly note the port number that you will get in the previous command prompt and change the port number in the curl

1. Getting the List of Items
   curl --insecure https://localhost:7010/api/glossary

```
D:\>curl --insecure  https://localhost:7136/api/glossary
[{"term":"HTML","definition":"Hypertext Markup Language"},{"term":"MVC","definition":"Model View Controller"},{"term":"O
penID","definition":"An open standard for authentication"}]
D:\>
```

2. Getting Single Item
   a. curl --insecure https://localhost:7010/api/glossary/MVC

```
D:\>curl --insecure  https://localhost:7136/api/glossary/MVC
{"term":"MVC","definition":"Model View Controller"}
```

   b. curl --insecure https://localhost:7010/api/glossary/HTML

```
D:\>curl --insecure  https://localhost:7136/api/glossary/HTML
{"term":"HTML","definition":"Hypertext Markup Language"}
D:\>
```

   c. curl --insecure https://localhost:7010/api/glossary/OpenID

```
D:\>curl --insecure  https://localhost:7136/api/glossary/OpenID
{"term":"OpenID","definition":"An open standard for authentication"}
D:\>
```

3. Creating an item
   curl --insecure -X POST -d "{\"term\": \"MFA\", \"definition\":\"An authentication process.\"}" -H "Content-Type:application/json" https://localhost:7010/api/glossary

```
D:\>curl --insecure -X POST -d "{\"term\": \"MFA\", \"definition\":\"An authentication process.\"}" -H "Content-Type:app
lication/json" https://localhost:7136/api/glossary
{"term":"MFA","definition":"An authentication process."}
D:\>
```

4. Updating an Item
   curl --insecure -X PUT -d "{\"term\": \"MVC\", \"definition\":\"Modified record of Model View Controller.\"}" -H "Content-Type:application/json" https://localhost:7010/api/glossary

```
[illegible]
```

5. Delete an Item
curl --insecure --request DELETE --url https://localhost:7010/api/glossary/openid

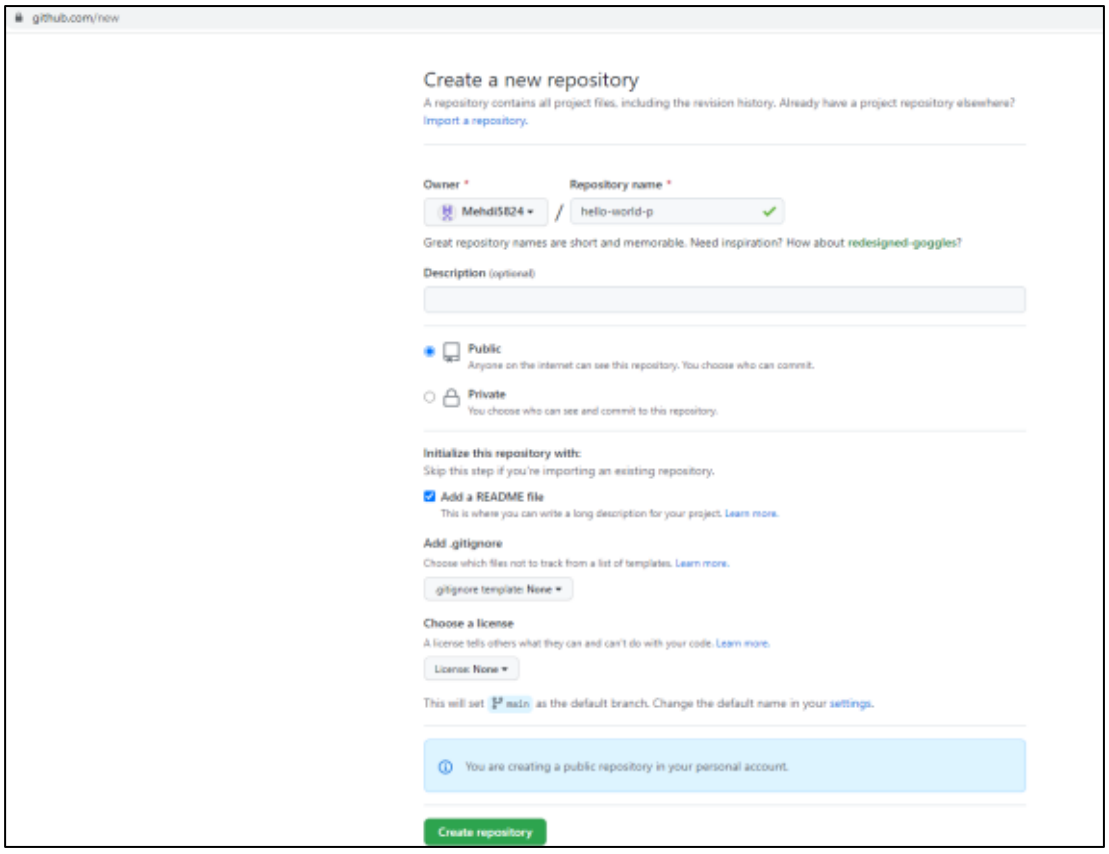
Practical No 6

Aim: Working with Circle CI for continuous integration

Steps and its output:

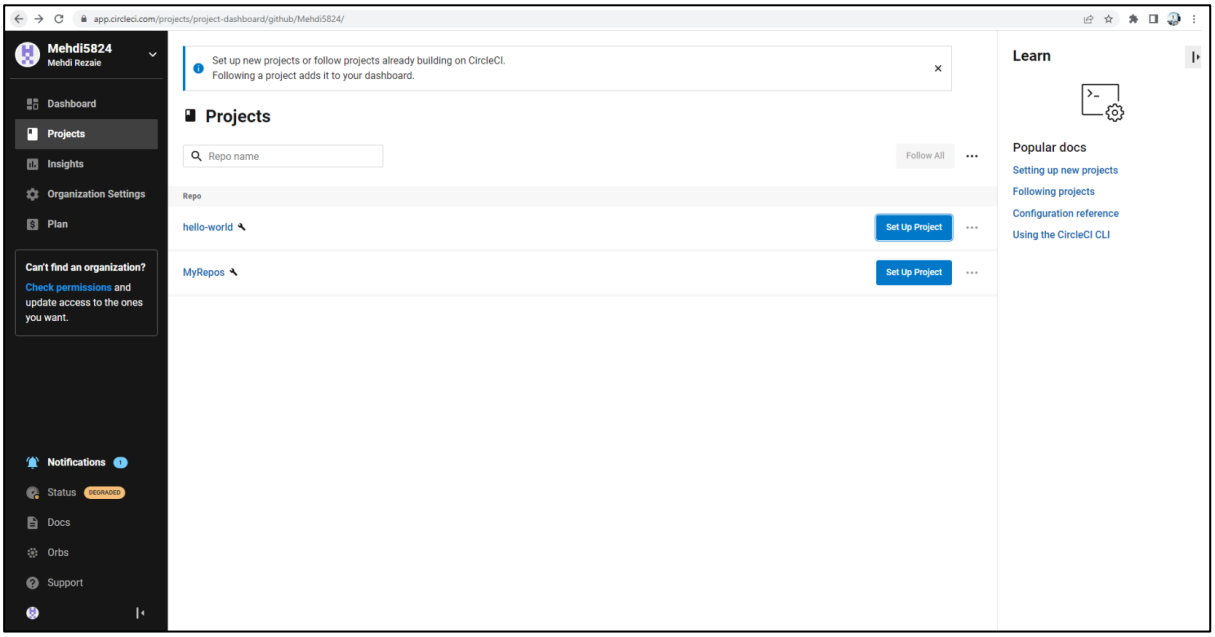
Step 1: **Create a repository**

1. Log in to GitHub and begin the process to create a new repository.
2. Enter a name for your repository (for example, hello-world).
3. Select the option to initialize the repository with a README file.
4. Finally, click Create repository.
5. There is no need to add any source code for now.

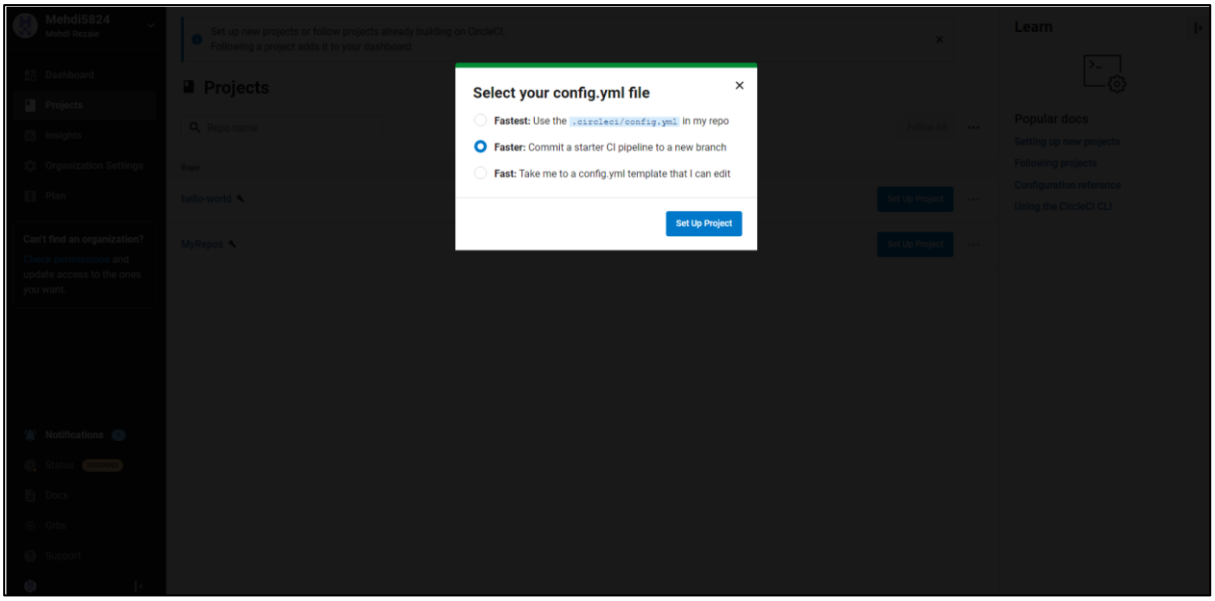


Step 2: **Set up CircleCI**

- Login to Circle CI https://app.circleci.com/ using GitHub Login
- Navigate to the CircleCI Projects page. If you created your new repository under an organization, you will need to select the organization name.



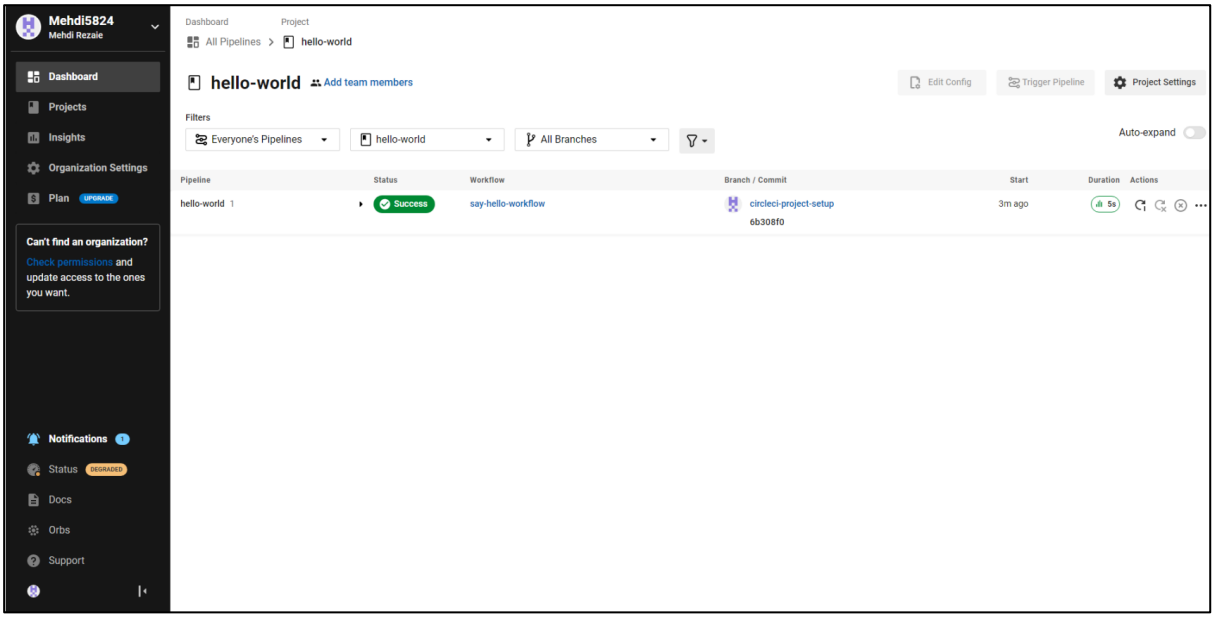
- You will be taken to the Projects dashboard. On the dashboard, select the project you want to set up (hello-world).
- Select the option to commit a starter CI pipeline to a new branch, and click Set Up Project. This will create a file ***.circleci/config.yml*** at the root of your repository on a new branch called circleci-project-setup.



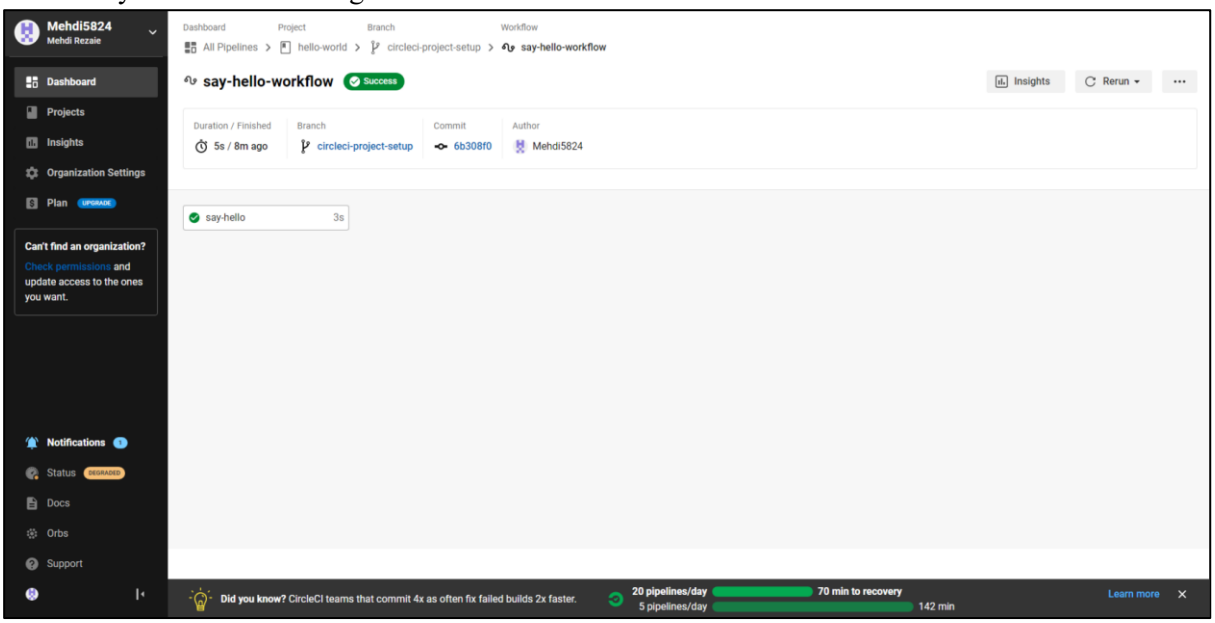
Step 3: **Your first pipeline**

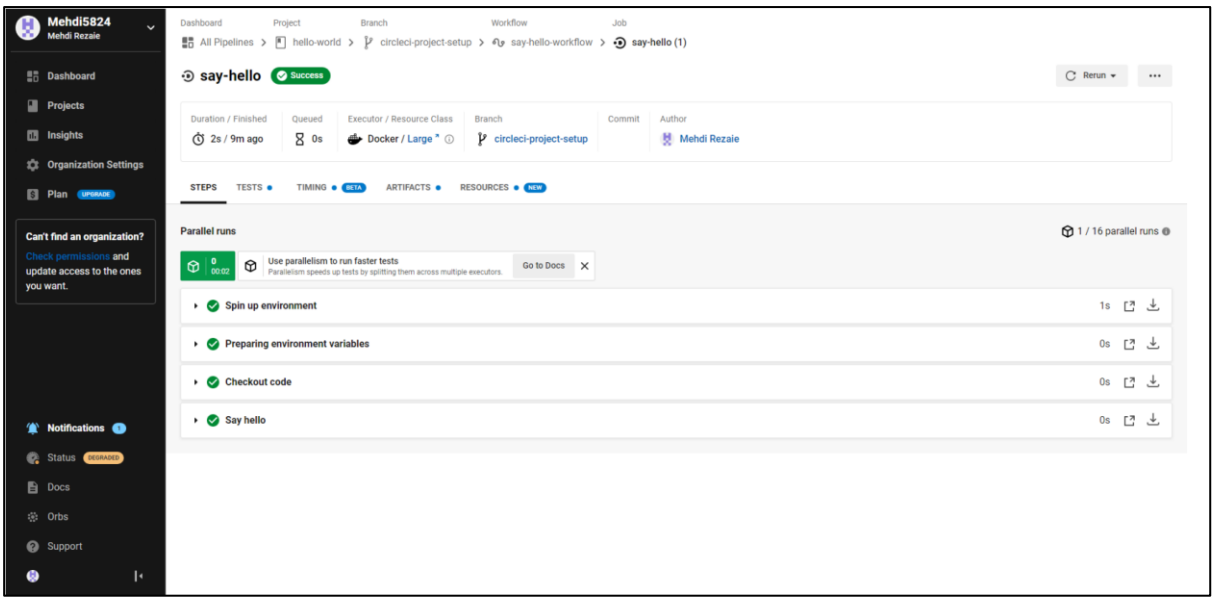
- On your project's pipeline page, click the green Success button, which brings you to the workflow that ran (say-helloworkflow).

- Within this workflow, the pipeline ran one job, called say-hello. Click say-hello to see the steps in this job:
    - Spin up environment
    - Preparing environment variables
    - Checkout code
    - Say hello
- Now select the “say-hello-workflow”

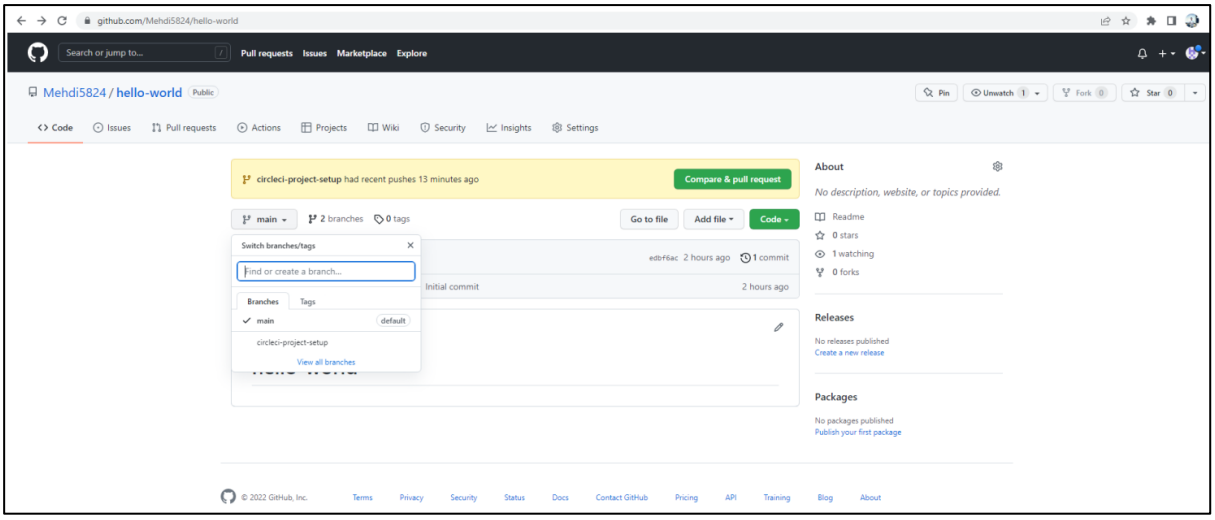


- Select “say-hello” Job with a green tick



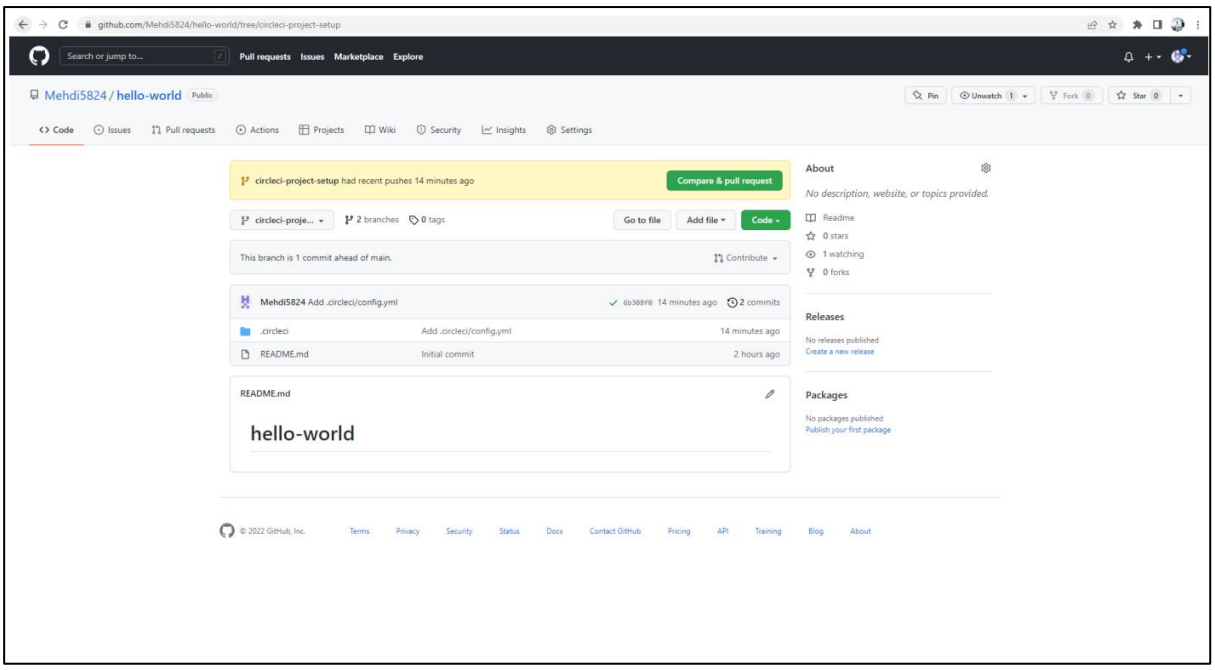


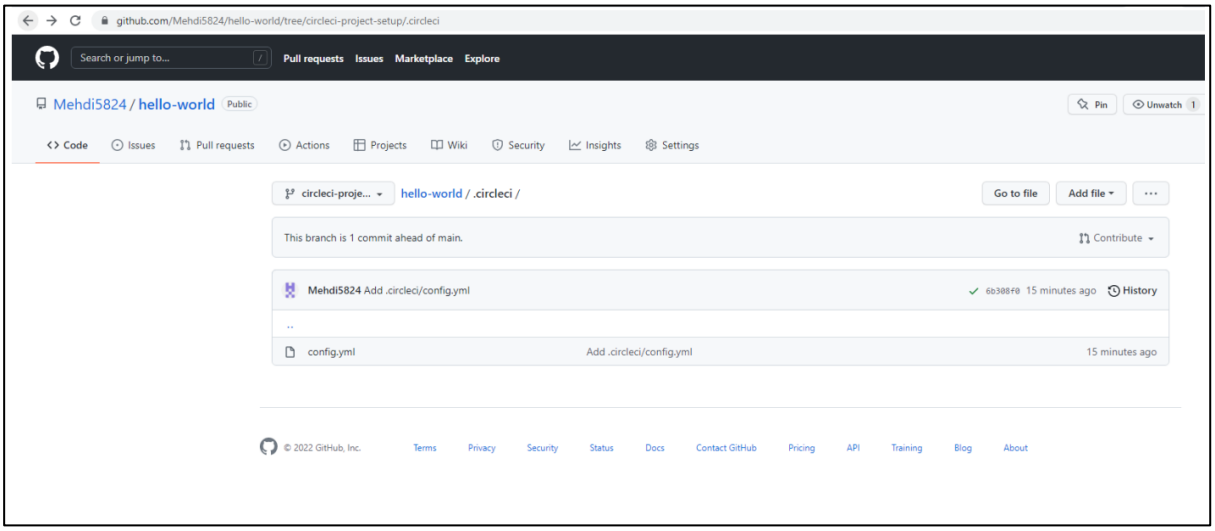
- Select Branch and option circleci-project-setup

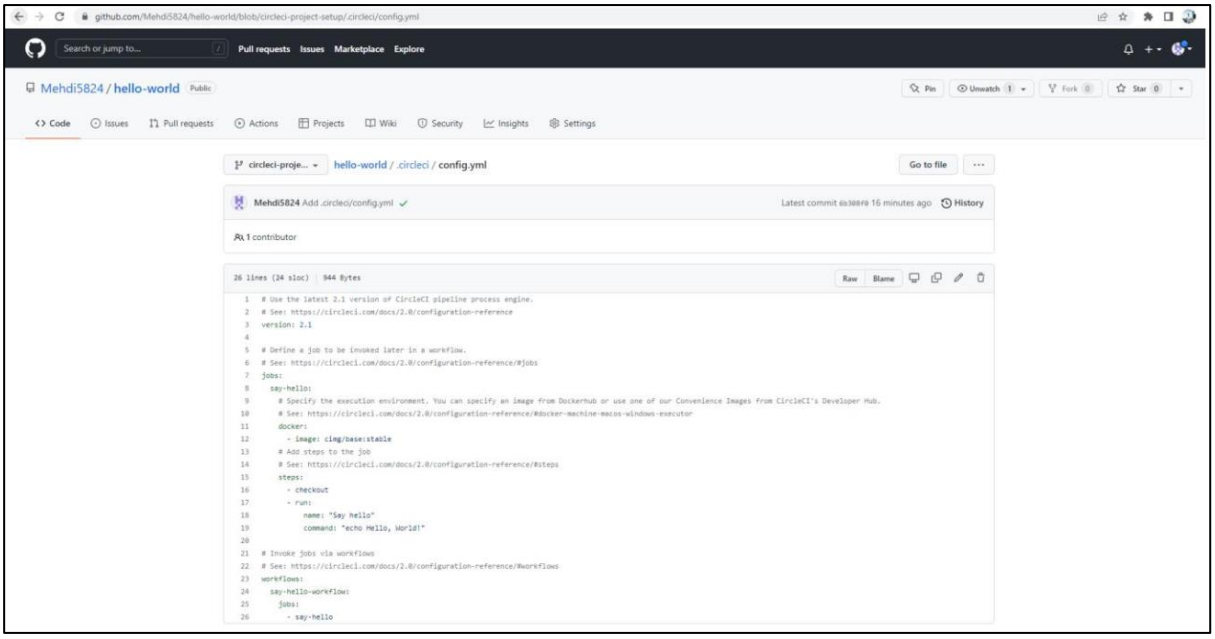


Step 4: **Break your build**

- In this section, you will edit the .circleci/config.yml file and see what happens if a build does not complete successfully.
- It is possible to edit files directly on GitHub.


github.com/Mehdi5824/hello-world/tree/circleci-project-setup
Search or jump to...
Pull requests
Issues
Marketplace
Explore
Mehdi5824 / hello-world
Public
Pin
Unwatch 1
Fork 0
Star 0
Code
Issues
Pull requests
Actions
Projects
Wiki
Security
Insights
Settings
circleci-project-setup had recent pushes 14 minutes ago
Compare & pull request
circleci-proje...
2 branches
0 tags
Go to file
Add file
Code
This branch is 1 commit ahead of main.
Contribute
Mehdi5824 Add .circleci/config.yml
6b308f0 14 minutes ago
2 commits
.circleci
Add .circleci/config.yml
14 minutes ago
README.md
Initial commit
2 hours ago
README.md
hello-world
About
No description, website, or topics provided.
Readme
0 stars
1 watching
0 forks
Releases
No releases published
Create a new release
Packages
No packages published
Publish your first package
© 2022 GitHub, Inc.
Terms
Privacy
Security
Status
Docs
Contact GitHub
Pricing
API
Training
Blog
About

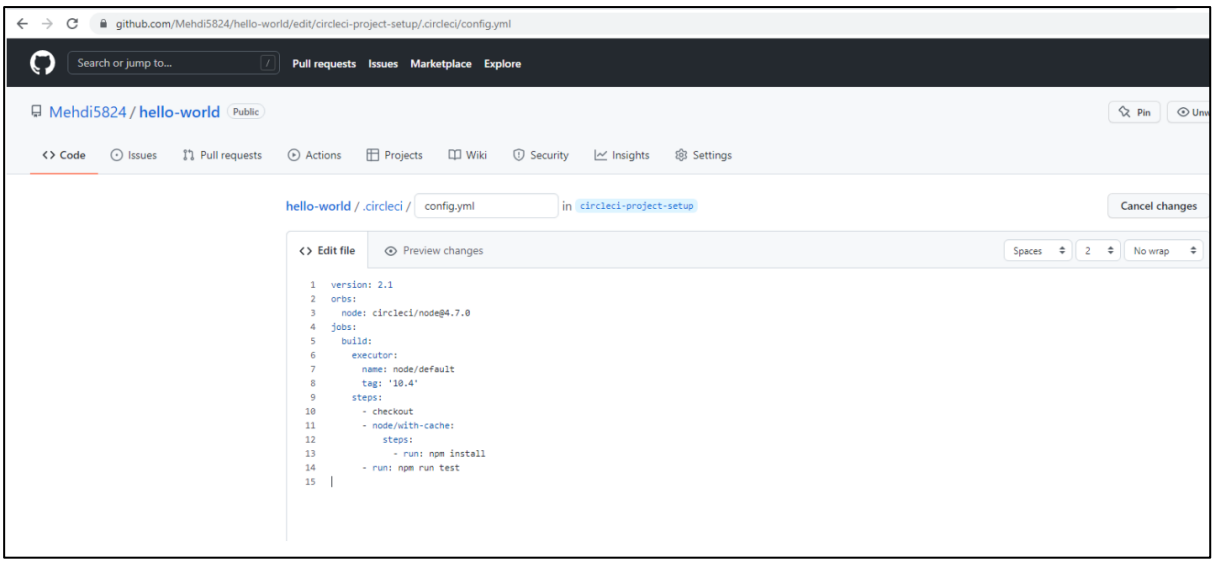

github.com/Mehdi5824/hello-world/tree/circleci-project-setup/.circleci
Search or jump to...
Pull requests
Issues
Marketplace
Explore
Mehdi5824 / hello-world
Public
Pin
Unwatch 1
Code
Issues
Pull requests
Actions
Projects
Wiki
Security
Insights
Settings
circleci-proje...
hello-world / .circleci /
Go to file
Add file
This branch is 1 commit ahead of main.
Contribute
Mehdi5824 Add .circleci/config.yml
6b308f0 15 minutes ago
History
..
config.yml
Add .circleci/config.yml
15 minutes ago
© 2022 GitHub, Inc.
Terms
Privacy
Security
Status
Docs
Contact GitHub
Pricing
API
Training
Blog
About



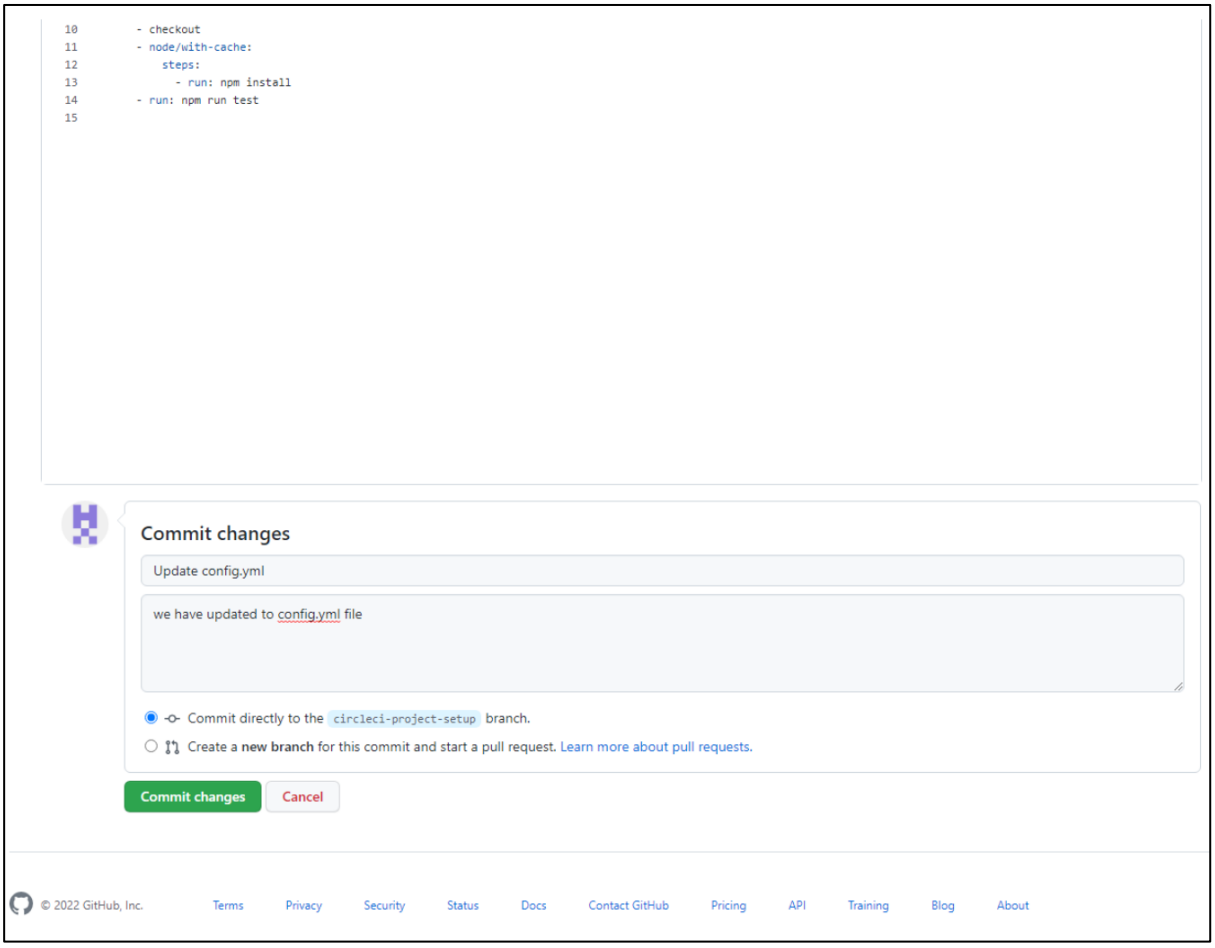
Let's use the Node orb. Replace the existing config by pasting the following code:

```
version: 2.1
orbs:
  node: circleci/node@4.7.0
jobs:
  build:
    executor:
      name: node/default
      tag: '10.4'
    steps:
      - checkout
      - node/with-cache:
          steps:
            - run: npm install
      - run: npm run test
```

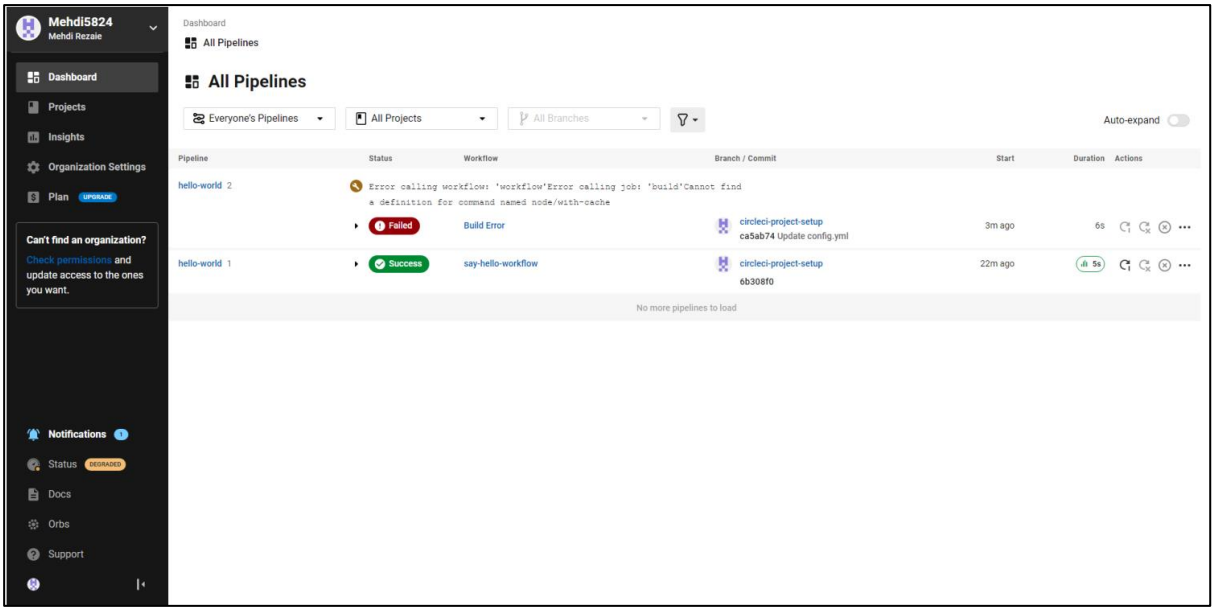
The GitHub file editor should look like this



Scroll down and Commit your changes on GitHub



- After committing your changes, then return to the Projects page in CircleCI. You should see a new pipeline running… and it will fail! The Node orb runs some common Node tasks. Because you are working with an empty repository, running npm run test, a Node script, causes the configuration to fail. To fix this, you need to set up a Node project in your repository.



Step 5: **Use Workflows**

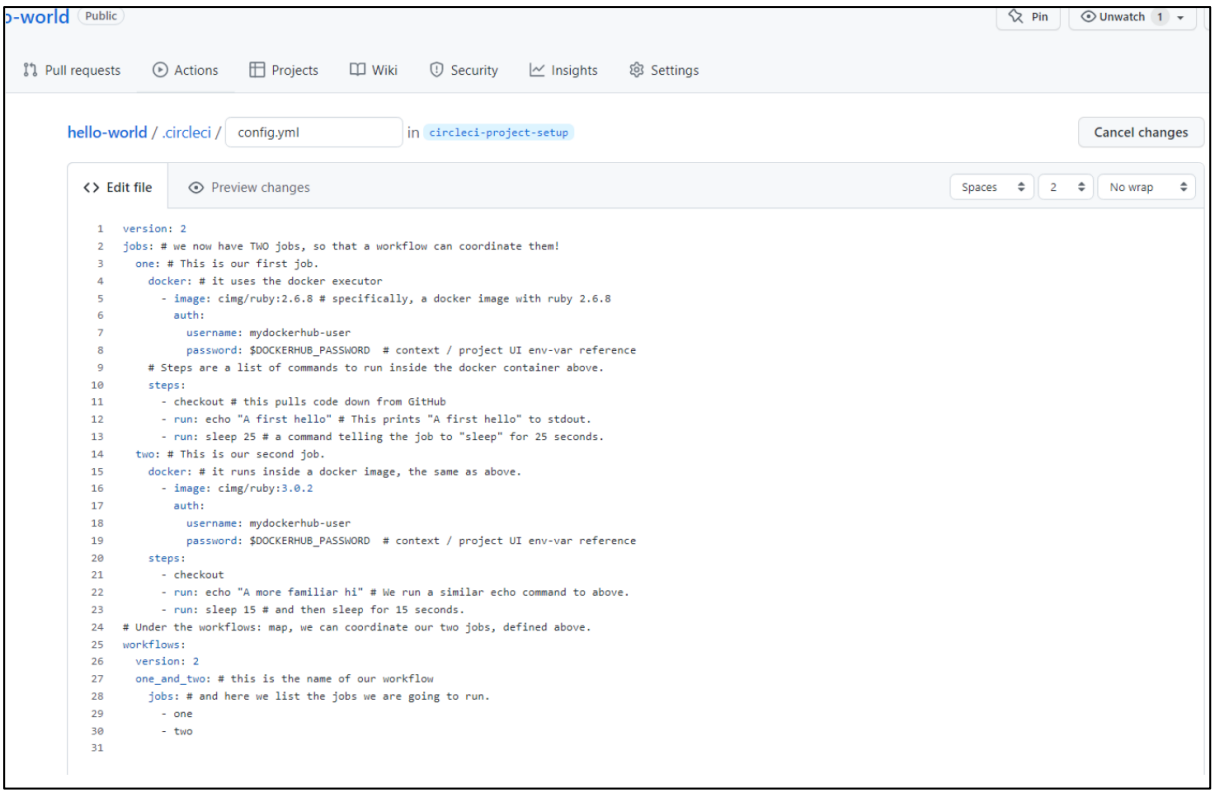
You do not have to use orbs to use CircleCI. The following example details how to create a custom configuration that also uses the workflow feature of CircleCI.

- Take a moment and read the comments in the code block below. Then, to see workflows in action, edit your .circleci/config.yml file and copy and paste the following text into it.

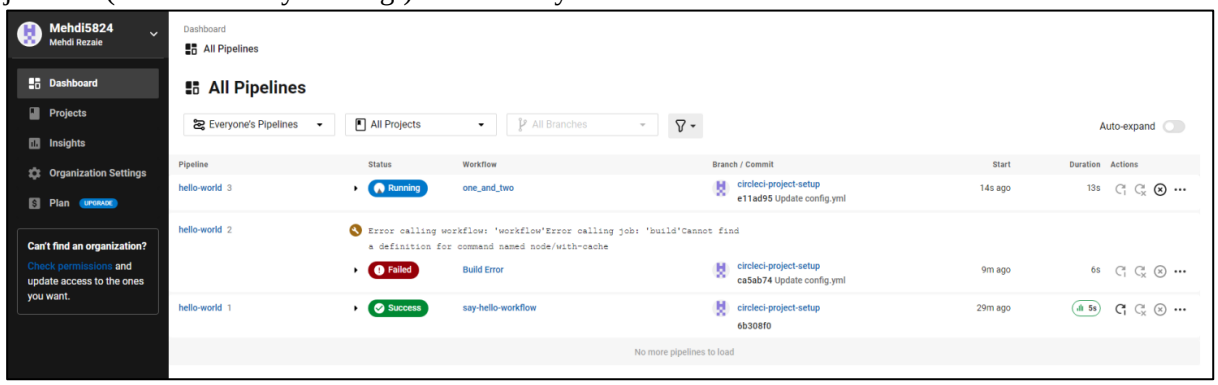
```yaml
version: 2
jobs: # we now have TWO jobs, so that a workflow can coordinate them!
  one: # This is our first job.
    docker: # it uses the docker executor
      - image: cimg/ruby:2.6.8 # specifically, a docker image with ruby 2.6.8
        auth:
          username: mydockerhub-user
          password: $DOCKERHUB_PASSWORD  # context / project UI env-var reference
    # Steps are a list of commands to run inside the docker container above.
    steps:
      - checkout # this pulls code down from GitHub
      - run: echo "A first hello" # This prints "A first hello" to stdout.
      - run: sleep 25 # a command telling the job to "sleep" for 25 seconds.
  two: # This is our second job.
    docker: # it runs inside a docker image, the same as above.
      - image: cimg/ruby:3.0.2
        auth:
          username: mydockerhub-user
          password: $DOCKERHUB_PASSWORD  # context / project UI env-var reference
    steps:
      - checkout
      - run: echo "A more familiar hi" # We run a similar echo command to above.
      - run: sleep 15 # and then sleep for 15 seconds.
# Under the workflows: map, we can coordinate our two jobs, defined above.
workflows:
  version: 2
  one_and_two: # this is the name of our workflow
    jobs: # and here we list the jobs we are going to run.
      - one
      - two
```

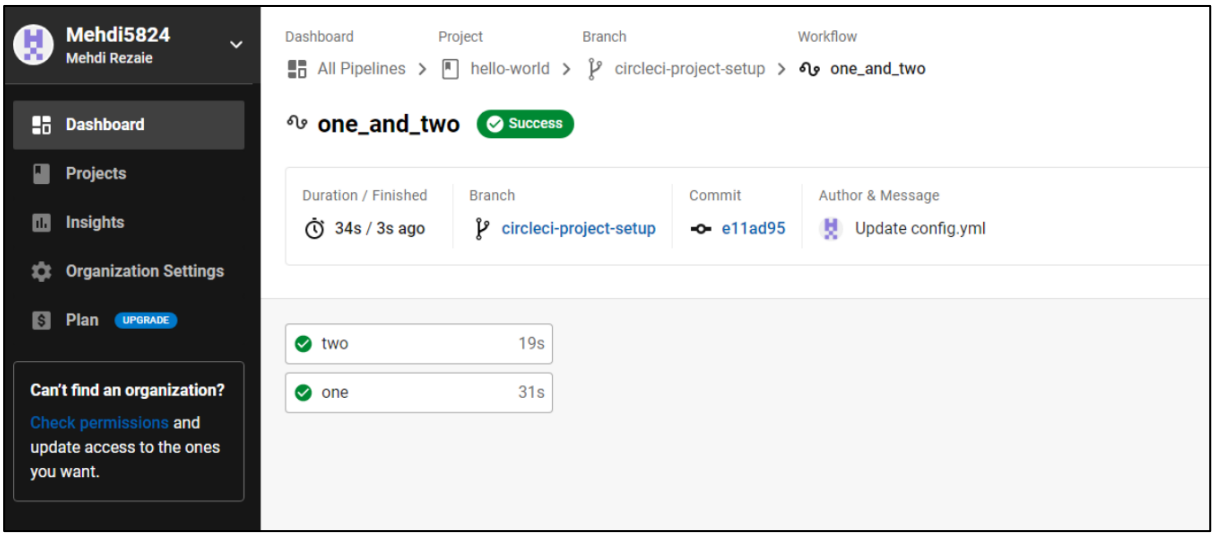
You don’t need to write the comments which are the text after #

- Commit these changes to your repository and navigate back to the CircleCI Pipelines page. You should see your pipeline running.



- Click on the running pipeline to view the workflow you have created. You should see that two jobs ran (or are currently running!) concurrently.



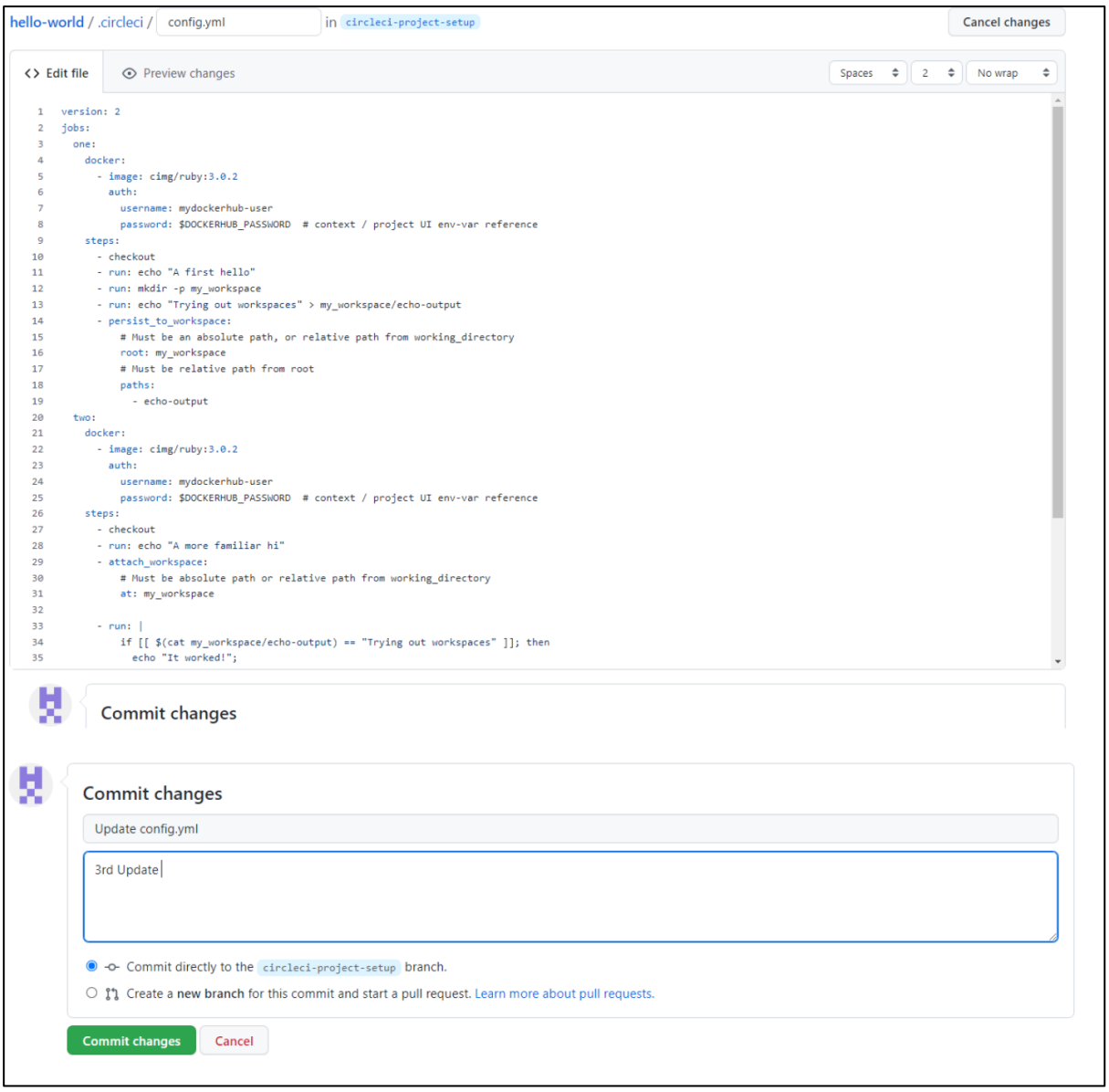


Step 6: **Add some changes to use workspaces**

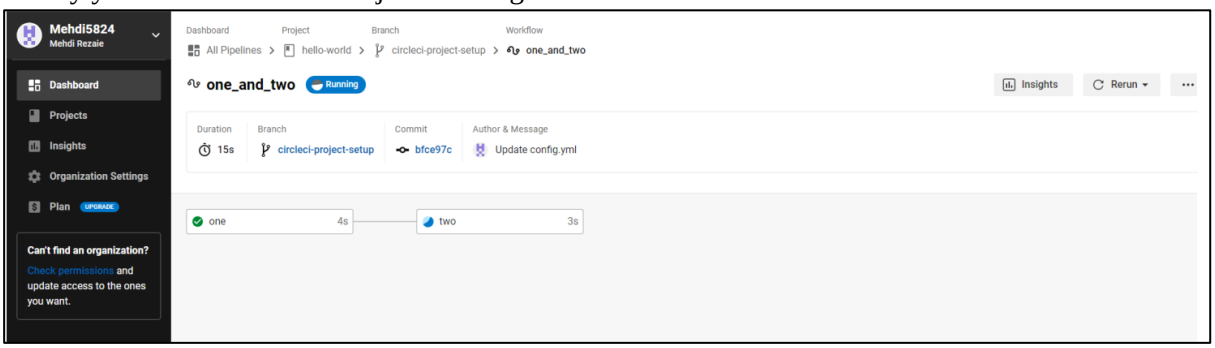
- Each workflow has an associated workspace which can be used to transfer files to downstream jobs as the workflow progresses. You can use workspaces to pass along data that is unique to this run and which is needed for downstream jobs. Try updating config.yml to the following:

```
version: 2
jobs:
  one:
    docker:
      - image: cimg/ruby:3.0.2
        auth:
          username: mydockerhub-user
          password: $DOCKERHUB_PASSWORD  # context / project UI env-var reference
    steps:
      - checkout
      - run: echo "A first hello"
      - run: mkdir -p my_workspace
      - run: echo "Trying out workspaces" > my_workspace/echo-output
      - persist_to_workspace:
          # Must be an absolute path, or relative path from working_directory
          root: my_workspace
          # Must be relative path from root
          paths:
            - echo-output
  two:
    docker:
      - image: cimg/ruby:3.0.2
        auth:
          username: mydockerhub-user
          password: $DOCKERHUB_PASSWORD  # context / project UI env-var reference
    steps:
      - checkout
      - run: echo "A more familiar hi"
      - attach_workspace:
          # Must be absolute path or relative path from working_directory
          at: my_workspace

      - run: |
          if [[ $(cat my_workspace/echo-output) == "Trying out workspaces" ]]; then
            echo "It worked!";
          else
            echo "Nope!"; exit 1
          fi
workflows:
  version: 2
  one_and_two:
    jobs:
      - one
      - two:
          requires:
            - one
```

- Updated config.yml in GitHub file editor should be updated like this



- Finally your workflow with the jobs running should look like this



Practical No 7

Aim: Working with TeamService

Source Code:

Step 1:

- Open command prompt and create a web api

```
C:\Windows\System32\cmd.exe

D:\>dotnet new webapi -o TeamService
The template "ASP.NET Core Web API" was created successfully.

Processing post-creation actions...
Running 'dotnet restore' on TeamService\TeamService.csproj...
  Restore completed in 5.9 sec for D:\TeamService\TeamService.csproj.

Restore succeeded.
```

- Remove existing weatherforecast files both model and controller files.

Step 2:

- Add new files as follows:
- Add Member.cs to “D:\TeamService\Models” folder

```
using System;
namespace TeamService.Models
{
	public class Member
	{
		public Guid ID { get; set; }

		public string FirstName { get; set; }
		public string LastName { get; set; }
		public Member() { }
		public Member(Guid id) : this()
		{
			this.ID = id;
		}
		public Member(string firstName, string lastName, Guid id) :
		this(id)
		{
			this.FirstName = firstName;
			this.LastName = lastName;
		}
		public override string ToString()
		{
			return this.LastName;
		}
	}
}
```

- Add Team.cs to “D:\TeamService\Models” folder

```
using System;
using System.Collections.Generic;
namespace TeamService.Models
{
	public class Team
	{
		public string Name { get; set; }
		public Guid ID { get; set; }
		public ICollection<Member> Members { get; set; }public
		Team()
		{
			this.Members = new List<Member>();
		}
		public Team(string name) : this()
		{
			this.Name = name;
		}
		public Team(string name, Guid id) : this(name)
		{
			this.ID = id;
		}
		public override string ToString()
		{
			return this.Name;
		}
	}
}
```

- add TeamsController.cs file to “D:\TeamService\Controllers” folder

```
using System;
using Microsoft.AspNetCore.Hosting;
using Microsoft.AspNetCore.Builder;
using Microsoft.AspNetCore.Mvc;
using System.Collections.Generic;
using System.Linq;
using TeamService.Models;
using System.Threading.Tasks;
using TeamService.Persistence;
namespace TeamService
{
[Route("[controller]")]
	public class TeamsController : Controller
	{
		ITeamRepository repository;
		public TeamsController(ITeamRepository repo)
		{
			repository = repo;

		}

		[HttpGet]
		public virtual IActionResult GetAllTeams()
		{
			return this.Ok(repository.List());

		}

		[HttpGet("{id}")]
		public IActionResult GetTeam(Guid id)
		{
			Team team = repository.Get(id);
```

```
                        if (team != null)
                        {
                              return this.Ok(team);
                        }else
                        {
                              return this.NotFound();
                        }
                  }
                  [HttpPost]
                  public virtual IActionResult CreateTeam([FromBody]Team
            newTeam)
                  {
                        repository.Add(newTeam);
                        return this.Created($"/teams/{newTeam.ID}", newTeam);
                  }
                  [HttpPut("{id}")]
                  public virtual IActionResult UpdateTeam([FromBody]Team team,
            Guid id)
                  {
                        team.ID = id;
                        if(repository.Update(team) == null)
                        {
                              return this.NotFound();
                        }
                        else
                        {
                              return this.Ok(team);
                        }
                  }
                  [HttpDelete("{id}")]
                  public virtual IActionResult DeleteTeam(Guid id)
                  {
                        Team team = repository.Delete(id);
                        if (team == null)
                        {
                              return this.NotFound();
                        }
                        else
                        {
                              return this.Ok(team.ID);
                        }
                  }
            }
      }
```

- Add MembersController.cs file to “D:\TeamService\Controllers” folder

```
using System;
using Microsoft.AspNetCore.Hosting;
using Microsoft.AspNetCore.Builder;
using Microsoft.AspNetCore.Mvc;
using System.Collections.Generic;
using System.Linq;
using TeamService.Models;
using System.Threading.Tasks;
using TeamService.Persistence;namespace TeamService
{
[Route("/teams/{teamId}/[controller]")]
      public class MembersController : Controller
      {
```

```
        ITeamRepository repository;
        public MembersController(ITeamRepository repo)
        {
                repository = repo;
        }
        [HttpGet]
        public virtual IActionResult GetMembers(Guid teamID)
        {
                Team team = repository.Get(teamID);
                if(team == null)
                {
                        return this.NotFound();
                }
                else
                {
                        return this.Ok(team.Members);
                }
        }
        [HttpGet]
        [Route("/teams/{teamId}/[controller]/{memberId}")]
        public virtual IActionResult GetMember(Guid teamID, Guid
memberId)
        {
                Team team = repository.Get(teamID);
                if(team == null)

                {

                        return this.NotFound();
                }
                else
                {
                        var q = team.Members.Where(m => m.ID ==
                memberId);
                        if(q.Count() < 1)
                        {
                                return this.NotFound();
                        }
                        else
                        {
                                return this.Ok(q.First());

                        }

                }
        }
        [HttpPut]
        [Route("/teams/{teamId}/[controller]/{memberId}")]
        public virtual IActionResult UpdateMember([FromBody]Member
updatedMember, Guid teamID, Guid memberId)
        {
                Team team = repository.Get(teamID);
                if(team == null)
                {
                        return this.NotFound();
                }
                else
                {
                        var q = team.Members.Where(m => m.ID ==
                memberId);
                        if(q.Count() < 1)
```

```
                        {
                                return this.NotFound();
                        }
                        else
                        {
                                team.Members.Remove(q.First());
                                team.Members.Add(updatedMember);
                                return this.Ok();
                        }
                }
        }
        [HttpPost]
        public virtual IActionResult CreateMember([FromBody]Member
newMember, Guid teamID)
        {
                Team team = repository.Get(teamID);
                if(team == null)
                {
                        return this.NotFound();
                }
                else
                {
                        team.Members.Add(newMember);
                        var teamMember = new {TeamID = team.ID,
                MemberID = newMember.ID};
                        return
                        this.Created($"/teams/{teamMember.TeamID}/[cont
                        roller]/{teamMember.MemberID}", teamMember);
                }
        }
        [HttpGet]
        [Route("/members/{memberId}/team")]
        public IActionResult GetTeamForMember(Guid memberId)
        {
                var teamId = GetTeamIdForMember(memberId);
                if (teamId != Guid.Empty)
                {
                        return this.Ok(new {TeamID = teamId });
                }
                else
                {
                        return this.NotFound();
                }
        }
        private Guid GetTeamIdForMember(Guid memberId)
        {
                foreach (var team in repository.List())
                {
                        var member = team.Members.FirstOrDefault( m =>
                m.ID == memberId);
                        if (member != null)
                        {
                                return team.ID;
                        }

                }

                return Guid.Empty;
        }
}
```

```
}
```

Step 3:

- Create folder "D:\TeamService\Persistence"
- Add file ITeamReposiroty.cs in "D:\TeamService\Persistence" folder

```
using System;
using System.Collections.Generic;
using TeamService.Models;
namespace TeamService.Persistence
{
	public interface ITeamRepository
	{
		IEnumerable<Team> List();
		Team Get(Guid id);
		Team Add(Team team);
		Team Update(Team team);
		Team Delete(Guid id);
	}
}
```

- Add MemoryTeamRepository.cs in "D:\TeamService\Persistence" folder

```
using System;
using System.Collections.Generic;
using System.Linq;
using TeamService;
using TeamService.Models;
namespace TeamService.Persistence
{
	public class MemoryTeamRepository : ITeamRepository
	{
		protected static ICollection<Team> teams;
		public MemoryTeamRepository()
		{
			if(teams == null)
			{
				teams = new List<Team>();
			}
		}
		public MemoryTeamRepository(ICollection<Team> teams)
		{
			MemoryTeamRepository.teams = teams;
		}
		public IEnumerable<Team> List()
		{
			return teams;
		}
		public Team Get(Guid id)
		{
			return teams.FirstOrDefault(t => t.ID == id);
		}
		public Team Update(Team t)
		{
			Team team = this.Delete(t.ID);
			if(team != null)
			{
				team = this.Add(t);
			}
			return team;
```

```
                }
                public Team Add(Team team)
                {
                        teams.Add(team);
                        return team;
                }
                public Team Delete(Guid id)
                {
                        var q = teams.Where(t => t.ID == id);
                        Team team = null;
                        if (q.Count() > 0)
                        {
                                team = q.First();
                                teams.Remove(team);
                        }
                        return team;
                }
        }
}
```

Step 4:

- Add following line to Startup.cs in public void ConfigureServices(IServiceCollection services) method
  `services.AddScoped<ITeamRepository, MemoryTeamRepository>();`

Output:

- Open two command prompt
- Command Prompt 1: go inside folder teamservice first

```
Command Prompt - dotnet run

D:\TeamService>dotnet run
info: Microsoft.Hosting.Lifetime[0]
      Now listening on: https://localhost:5001
info: Microsoft.Hosting.Lifetime[0]
      Now listening on: http://localhost:5000
info: Microsoft.Hosting.Lifetime[0]
      Application started. Press Ctrl+C to shut down.
info: Microsoft.Hosting.Lifetime[0]
      Hosting environment: Development
info: Microsoft.Hosting.Lifetime[0]
      Content root path: D:\TeamService
```

- On Command Prompt 2:
  To get all teams
  curl --insecure https://localhost:5001/teams

```
D:\>curl --insecure https://localhost:5001/teams
[]
```

  To create new team
  curl --insecure -H “Content-Type:application/json” –X POST –d “{\“id\”:\”e52baa63-d511-417e-9e54-7aab04286281\”, \”name\”:\”KC\”}” https://localhost:5001/teams

```
D:\>curl --insecure -H "Content-Type:application/json" -X POST -d "{\"id\":\"e52baa63-d511-417e-9e54-7aab
04286281\",\"name\":\"KC\"}" https://localhost:5001/teams
{"name":"KC","id":"e52baa63-d511-417e-9e54-7aab04286281","members":[]}
D:\>
```

To create one more new team

```
curl --insecure -H "Content-Type:application/json" -X POST -d
"{\"id\":\"e12baa63-d511-417e-9e54-7aab04286281\", \"name\":\"MSC
Part1\"}" https://localhost:5001/teams
```

```
D:\>curl --insecure -H "Content-Type:application/json" -X POST -d "{\"id\":\"e12baa63-d511-417e-9e54-7aab
04286281\", \"name\":\"MSC Part1\"}"  https://localhost:5001/teams
{"name":"MSC Part1","id":"e12baa63-d511-417e-9e54-7aab04286281","members":[]}
D:\>
```

To get all teams

```
curl --insecure https://localhost:5001/teams
```

```
D:\>curl --insecure https://localhost:5001/teams
[{"name":"KC","id":"e52baa63-d511-417e-9e54-7aab04286281","members":[]},{"name":"MSC Part1","id":"e12baa6
3-d511-417e-9e54-7aab04286281","members":[]}]
D:\>
```

To get single team with team-id as parameter

```
curl --insecure https://localhost:5001/teams/e52baa63-d511-417e-9e54-
7aab04286281
```

```
D:\> curl --insecure https://localhost:5001/teams/e52baa63-d511-417e-9e54-7aab04286281
{"name":"KC","id":"e52baa63-d511-417e-9e54-7aab04286281","members":[]}
D:\>
```

To update team details (change name of first team from "KC" to "KC IT DEPT")

```
curl --insecure -H "Content-Type:application/json" -X PUT -d
"{\"id\":\"e52baa63-d511-417e-9e54- 7aab04286281\", \"name\":\"KC IT
DEPT\"}"  https://localhost:5001/teams/e52baa63-d511-417e-9e54-
7aab04286281
```

```
D:\>curl --insecure -H "Content-Type:application/json" -X PUT -d "{\"id\":\"e52baa63-d511-417e-9e54-7aab0
4286281\", \"name\":\"KC IT DEPT\"}"  https://localhost:5001/teams/e52baa63-d511-417e-9e54-7aab04286281
{"name":"KC IT DEPT","id":"e52baa63-d511-417e-9e54-7aab04286281","members":[]}
D:\>
```

To delete team

```
curl --insecure -H "Content-Type:application/json" -X DELETE
https://localhost:5001/teams/e52baa63-d511-417e-9e54-7aab04286281
```

```
Command Prompt

D:\>curl --insecure -H "Content-Type:application/json" -X DELETE   https://localhost:5001/teams/e52baa63-
d511-417e-9e54-7aab04286281
"e52baa63-d511-417e-9e54-7aab04286281"
D:\>
```

Confirm: with get all teams now it shows only one team (first one is deleted)

```
curl -insecure https://localhost:5001/teams
```

Command Prompt

```
D:\>curl --insecure https://localhost:5001/teams
[{"name":"MSC Part1","id":"e12baa63-d511-417e-9e54-7aab04286281","members":[]}]
D:\>
```