

**CHEMBUR TROMABY EDUCATION SOCIETY**  
**N. G. ACHARYA & D. K. MARATHE COLLEGE**  
**OF ARTS, SCIENCE & COMMERCE**

**N. G. Acharya Marg, Chembur, Mumbai – 400 071.**

**NAAC ACCREDITED COLLEGE**

**M.Sc ( Computer Science /Information Technology)**



## **Certificate**

*Certified that the work entered in this journal was done in the Computer laboratory by the student Mr. / Miss Dalvi Siddhesh Dinesh Roll No. A1-5 Of Class M.Sc IT & A Semester II During the Year 2021-2022 in a Satisfactory manner.*

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## 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.

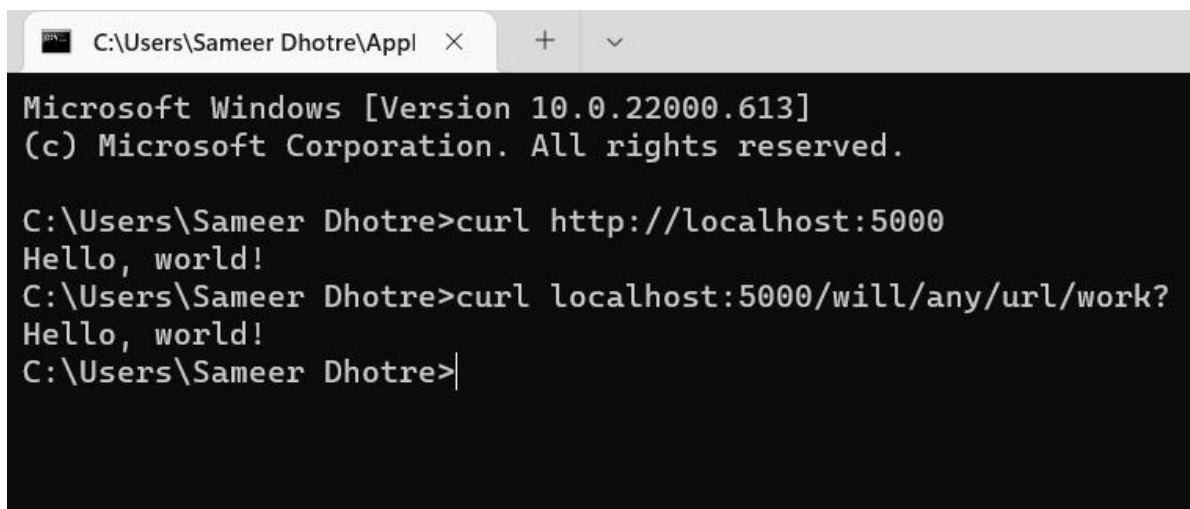
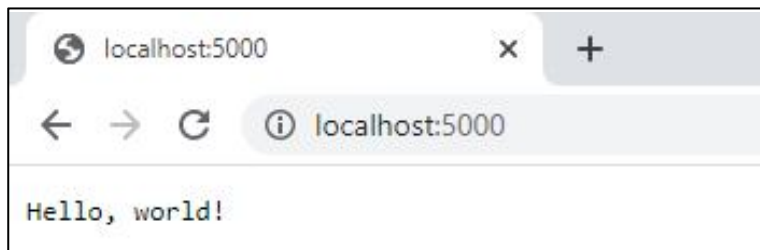
```
D:\MSA Pracs\HelloWorld>dotnet restore  
Determining projects to restore...  
All projects are up-to-date for restore.
```

**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-notices 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 the output

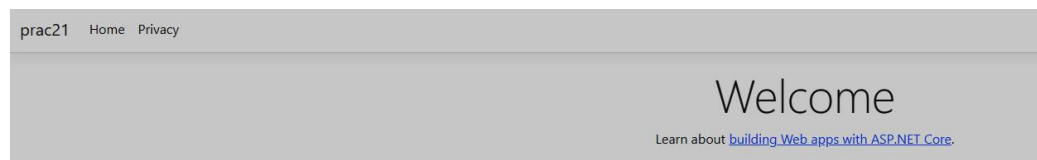
```
D:\Microservices Architecture\Practice Practical\Practs\pracs2>dotnet build
Microsoft (R) Build Engine version 17.1.1+a02f73656 for .NET
Copyright (C) Microsoft Corporation. All rights reserved.

  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 <ActionResult> 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

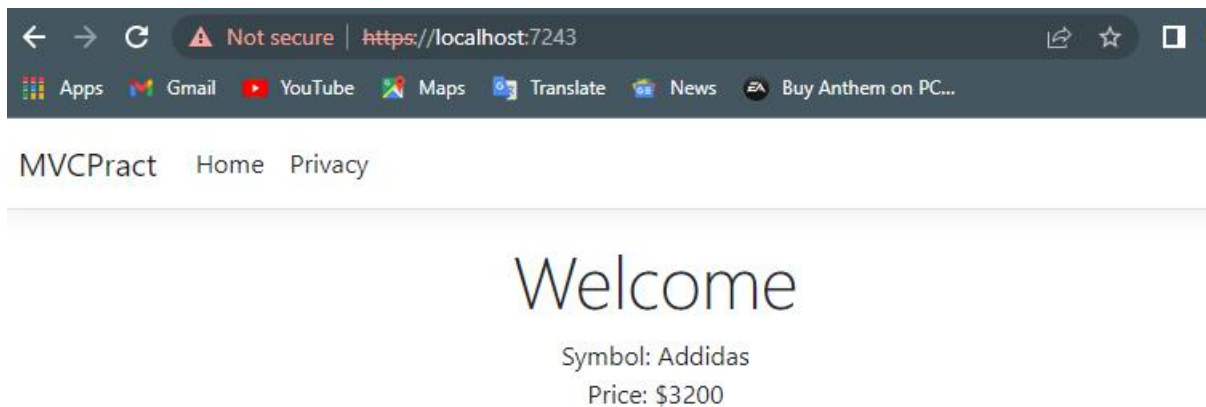
Build succeeded.
    0 Warning(s)
    0 Error(s)

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

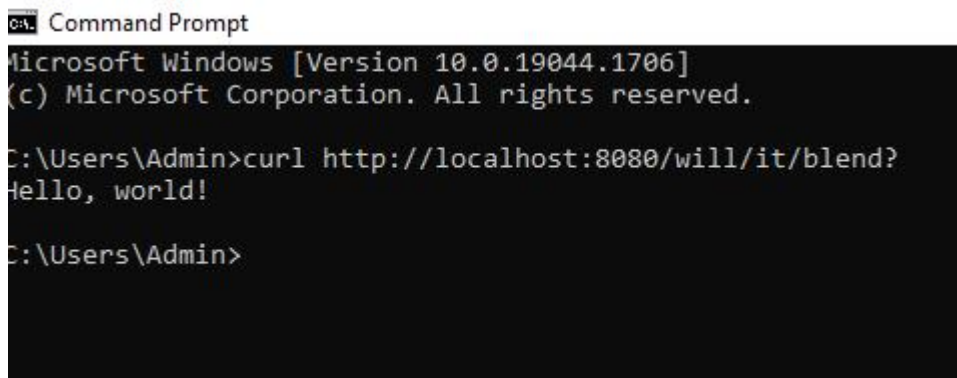
```
D:\msa>docker run -p 8080:8080 dotnetcoreservices/hello-world
Hosting environment: Production
Content root path: /pipeline/source/app/publish
Now listening on: http://0.0.0.0:8080
Application started. Press Ctrl+C to shut down.
```

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



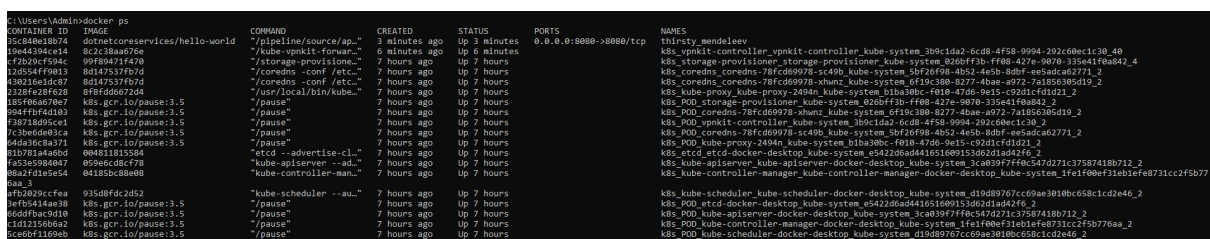
A screenshot of a web browser window. The address bar shows 'localhost:8080'. The page content displays 'Hello, world!' in a simple black font on a white background.

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



A screenshot of a Windows Command Prompt window. The title bar says 'C:\ Command Prompt'. The text inside shows the command 'curl http://localhost:8080/will/it/blend?' being entered, followed by the output 'Hello, world!'.

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



A screenshot of the output of the 'docker ps' command. It shows a list of running containers with columns for CONTAINER ID, IMAGE, COMMAND, CREATED, STATUS, PORTS, and NAMES. The first container is 'thirsty\_mendelev' running 'dotnetcoreservices/hello-world'.

| CONTAINER ID | IMAGE                          | COMMAND                  | CREATED       | STATUS       | PORTS                  | NAMES   |
|--------------|--------------------------------|--------------------------|---------------|--------------|------------------------|---|
| 195849e18b74 | dotnetcoreservices/hello-world | "/pipeline/source/ap..." | 3 minutes ago | Up 3 minutes | 0.0.0.0:8080->8080/tcp | thirsty_mendelev  |
| 19e44394ca14 | 8c2c38aa676e                   | "/kube-vpnkit-forwan..." | 6 minutes ago | Up 6 minutes |                        | k8s_vpnkit-controller_vpnkit-controller_kube-system_3b0c1da2-6c48-4f58-9994-292c68c1c30_40                  |
| f20294f594c  | 99f09471f470                   | "/storage-provisione..." | 7 hours ago   | Up 7 hours   |                        | k8s_storage-provisioner_storage-provisioner_kube-system_026ff3b-f408-427e-9070-335e41f0aa42_4               |
| 12d554ff9013 | 8d147537fb7d                   | "/coredns -conf /etc..." | 7 hours ago   | Up 7 hours   |                        | k8s_coredns_coredns-78fcd69978-sc49b_kube-system_5bf26f98-4b52-4e5b-8dbf-ee5adc4a2771_2                     |
| 438216e1dc87 | 8d147537fb7d                   | "/coredns -conf /etc..." | 7 hours ago   | Up 7 hours   |                        | k8s_coredns_coredns-78fcd69978-xhnm2_kube-system_6f19c388-8277-4bae-a972-7a1856385d19_2                     |
| 1329f62f0208 | 8f6f4d672d4                    | "/usr/local/bin/kube..." | 7 hours ago   | Up 7 hours   |                        | k8s_kube-proxy_kube-proxy-2d84e_kube-system_b1b3300c-f016-47d6-b615-c2d1c1fd1d21_2                          |
| 185f6ea670e7 | k8s.gcr.io/pause:3.5           | "/pause"                 | 7 hours ago   | Up 7 hours   |                        | k8s_POD_storage-provisioner_kube-system_026ff3b-f408-427e-9070-335e41f0aa42_2                               |
| 994ff1f4d103 | k8s.gcr.io/pause:3.5           | "/pause"                 | 7 hours ago   | Up 7 hours   |                        | k8s_POD_coredns-78fcd69978-xhnm2_kube-system_6f19c388-8277-4bae-a972-7a1856385d19_2                         |
| f38718d05c01 | k8s.gcr.io/pause:3.5           | "/pause"                 | 7 hours ago   | Up 7 hours   |                        | k8s_POD_vpnkit-controller_kube-system_3b0c1da2-6c48-4f58-9994-292c68c1c30_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-ee5adc4a2771_2                         |
| 546e36e8a371 | k8s.gcr.io/pause:3.5           | "/pause"                 | 7 hours ago   | Up 7 hours   |                        | k8s_POD_kube-proxy-2d84e_kube-system_b1b3300c-f016-47d6-9e15-c2d1c1fd1d21_2                                 |
| 81b781a4a60d | 004811b15584                   | "etcd --advertise-cl..." | 7 hours ago   | Up 7 hours   |                        | k8s_etcd_etcd-docker-desktop_kube-system_e54226ad441651609153d62d1ad42f6_2                                  |
| fa53e594847  | 0586cd8cf78                    | "kube-apiserver --ad..." | 7 hours ago   | Up 7 hours   |                        | k8s_kube-apiserver_kube-apiserver-docker-desktop_kube-system_3ca839f7f40c547d271c37587418b712_2             |
| 8aa1f1e5e54  | 04159c88e08                    | "kube-controller-man..." | 7 hours ago   | Up 7 hours   |                        | k8s_kube-controller-manager_kube-controller-manager-docker-desktop_kube-system_1fc1f06e711eb1ef8731cc4f5b77 |
| 8aa3_3       | 93508fcd2d52                   | "kube-scheduler --au..." | 7 hours ago   | Up 7 hours   |                        | k8s_kube-scheduler_kube-scheduler-docker-desktop_kube-system_d19d89707cc09ae3010bc6581cd2e46_2              |
| 4ff2029ccfea | k8s.gcr.io/pause:3.5           | "/pause"                 | 7 hours ago   | Up 7 hours   |                        | k8s_POD_etcd-docker-desktop_kube-system_e54226ad441651609153d62d1ad42f6_2                                   |
| 84ff541faa38 | k8s.gcr.io/pause:3.5           | "/pause"                 | 7 hours ago   | Up 7 hours   |                        | k8s_POD_kube-apiserver-docker-desktop_kube-system_3ca839f7f40c547d271c37587418b712_2                        |
| 66d4fbac9d10 | k8s.gcr.io/pause:3.5           | "/pause"                 | 7 hours ago   | Up 7 hours   |                        | k8s_POD_kube-controller-manager-docker-desktop_kube-system_1fc1f06e711eb1ef8731cc4f5b77_2                   |
| c1012150b0a2 | k8s.gcr.io/pause:3.5           | "/pause"                 | 7 hours ago   | Up 7 hours   |                        | k8s_POD_kube-scheduler-docker-desktop_kube-system_d19d89707cc09ae3010bc6581cd2e46_2                         |
| cc60f1150b0a | k8s.gcr.io/pause:3.5           | "/pause"                 | 7 hours ago   | Up 7 hours   |                        |   |

- 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
975693bab0bb   8c2c38aa576e                      "/kube-vpnkit-forwar-"   About a minute ago    Up About a minute    Up 7 hours     k8s_vpnkit-controller_vpnkit-controller_kube-system_3b9c1da2-6c08-4f58-9994-202c08ec1c30_41
f2b20c4594c4   99f09471f470                      "/storage-provisioner-"  7 hours ago         Up 7 hours           Up 7 hours     k8s_storage-provisioner_storage-provisioner_kube-system_0260ff3b-ff08-427e-9070-335e41f0a842_4
12d554ff9013   8d147537f7d7                      "/coredns -conf /etc-"   7 hours ago         Up 7 hours           Up 7 hours     k8s_coredns_coredns-78fcd09978-sc49b_kube-system_5bf26f98-4b52-4e5b-8dbf-ee5adca62771_2
430216e1dc07   8d147537f7d7                      "/coredns -conf /etc-"   7 hours ago         Up 7 hours           Up 7 hours     k8s_coredns_coredns-78fcd09978-xhwnz_kube-system_6f49c308-8277-4bae-a972-7a1856305d19_2
1328f628f028   9f8f46672044                      "/usr/local/bin/kube-"   7 hours ago         Up 7 hours           Up 7 hours     k8s_kube-proxy_kube-proxy_2404n_kube-system_b1ba380c-f010-4106-9e15-c92d1cf4d121_2
185f9ea670e7   k8s.gcr.io/pause:3.5              "/pause"                 7 hours ago         Up 7 hours           Up 7 hours     k8s_POD_storage-provisioner_kube-system_0260ff3b-ff08-427e-9070-335e41f0a842_2
994ff7f4d103   k8s.gcr.io/pause:3.5              "/pause"                 7 hours ago         Up 7 hours           Up 7 hours     k8s_POD_coredns-78fcd09978-xhwnz_kube-system_6f49c308-8277-4bae-a972-7a1856305d19_2
f3b718095c11   k8s.gcr.io/pause:3.5              "/pause"                 7 hours ago         Up 7 hours           Up 7 hours     k8s_POD_vpnkit-controller_kube-system_3b9c1da2-6c08-4f58-9994-202c08ec1c30_2
7c3be6de03ca   k8s.gcr.io/pause:3.5              "/pause"                 7 hours ago         Up 7 hours           Up 7 hours     k8s_POD_coredns-78fcd09978-sc49b_kube-system_5bf26f98-4b52-4e5b-8dbf-ee5adca62771_2
4a4e36c8e371   k8s.gcr.io/pause:3.5              "/pause"                 7 hours ago         Up 7 hours           Up 7 hours     k8s_POD_kube-proxy_2404n_kube-system_b1ba380c-f010-4106-9e15-c92d1cf4d121_2
81b781a4a6d0   004011815284                      "etcd --advertise-cl-"   7 hours ago         Up 7 hours           Up 7 hours     k8s_etcd_etcd-docker-desktop_kube-system_e5422d6ad41651609153d62d1ad42f6_2
fa53e5984047   059e6cd8cf78                      "kube-apiserver --ad-"   7 hours ago         Up 7 hours           Up 7 hours     k8s_kube-apiserver_kube-apiserver-docker-desktop_kube-system_3ca039f77f0c547d271c37587418b712_2
86a21d1e5454   041150c38000                      "kube-controller-man-"   7 hours ago         Up 7 hours           Up 7 hours     k8s_kube-controller-manager_kube-controller-manager-docker-desktop_kube-system_1fe1f00ef31eb1efe8731cc2f5b776aa_3
a7b2029cfeaf   935d8f4c2d52                      "kube-scheduler --au-"   7 hours ago         Up 7 hours           Up 7 hours     k8s_kube-scheduler_kube-scheduler-docker-desktop_kube-system_d19d89767cc69ae3010bc6581cd2e46_2
3efb541ae38    k8s.gcr.io/pause:3.5              "/pause"                 7 hours ago         Up 7 hours           Up 7 hours     k8s_POD_etcd-docker-desktop_kube-system_e5422d6ad41651609153d62d1ad42f6_2
66d0fba9cd10   k8s.gcr.io/pause:3.5              "/pause"                 7 hours ago         Up 7 hours           Up 7 hours     k8s_POD_kube-apiserver-docker-desktop_kube-system_3ca039f77f0c547d271c37587418b712_2
c1d12150b6a2   k8s.gcr.io/pause:3.5              "/pause"                 7 hours ago         Up 7 hours           Up 7 hours     k8s_POD_kube-controller-manager-docker-desktop_kube-system_1fe1f00ef31eb1efe8731cc2f5b776aa_2
c6e0bf1169eb   k8s.gcr.io/pause:3.5              "/pause"                 7 hours ago         Up 7 hours           Up 7 hours     k8s_POD_kube-scheduler-docker-desktop_kube-system_d19d89767cc69ae3010bc6581cd2e46_2
```

## 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: sha256:80f31dalac7b312ba29d65080fddf797dd76acfb870e677f390d5acba9741b17  
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](https://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](https://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](https://hub.docker.com) now in tags tab

Tags and Scans

VULNERABILITY SCANNING - DISABLED  
[Enable](#)

This repository contains 1 tag(s).

| TAG  | OS  | PULLED | PUSHED        |
|--|---|--------|---------------|
|  firsttry |  | ---    | 4 minutes ago |

[See all](#)



**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

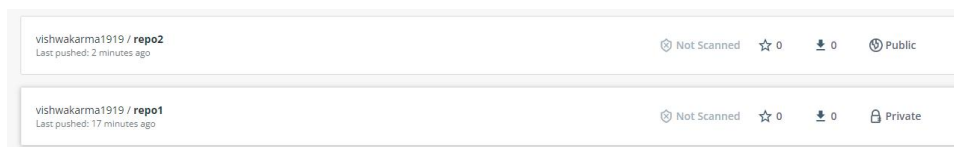
```
$ docker images
```

```
[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: sha256:4452bb83a562a0ce6a5e1fa11159957b8ad3cc62dff6ad14b60dd4e5dd29bf3 size: 527
```

- Check it in [hub.docker.com](https://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

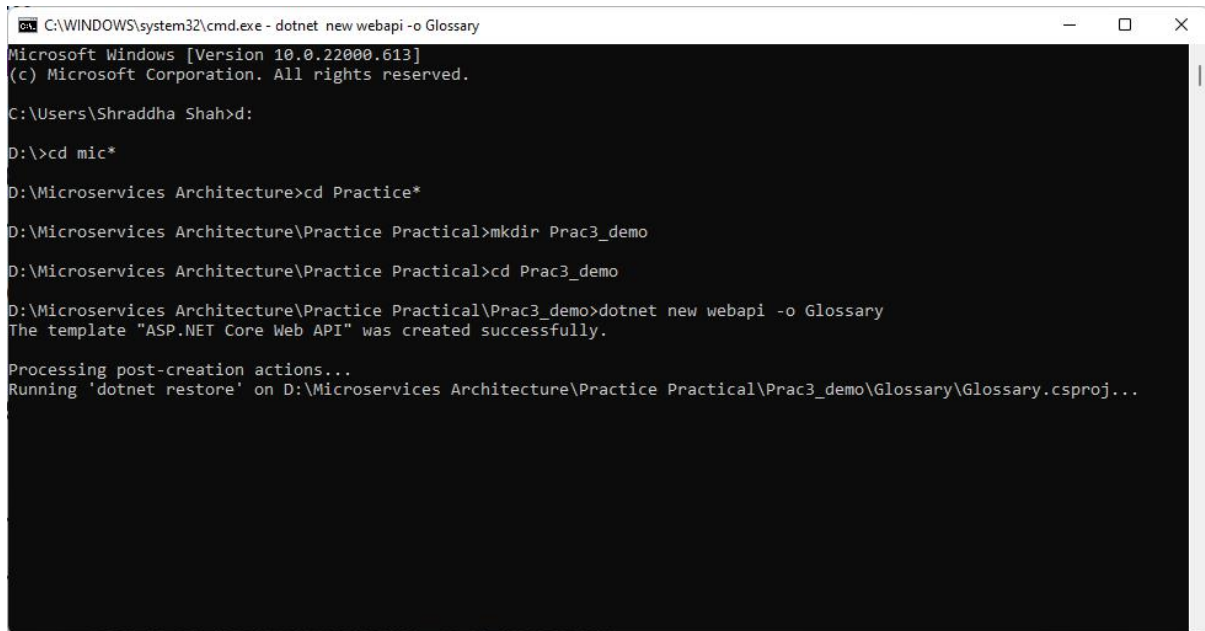
**Aim:** Building ASP.Net core REST API

**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*

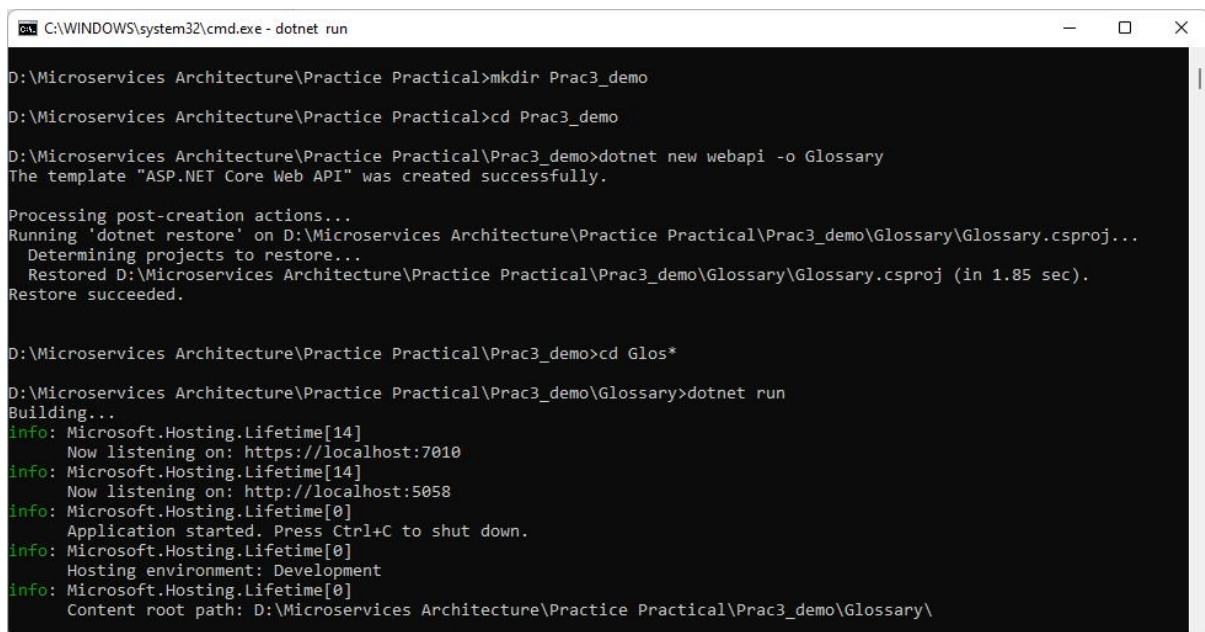
D:\Microservices Architecture\Practice Practical>mkdir Prac3_demo

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



```

C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.22000.613]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Shraddha Shah>curl --insecure https://localhost:7010/weatherforecast
[{"date":"2022-05-13T15:23:05.8755454+05:30","temperatureC":5,"temperatureF":40,"summary":"Mild"}, {"date":"2022-05-14T15:23:05.8755629+05:30","temperatureC":38,"temperatureF":100,"summary":"Mild"}, {"date":"2022-05-15T15:23:05.8755633+05:30","temperatureC":26,"temperatureF":78,"summary":"Warm"}, {"date":"2022-05-16T15:23:05.8755637+05:30","temperatureC":52,"temperatureF":125,"summary":"Scorching"}, {"date":"2022-05-17T15:23:05.875564+05:30","temperatureC":3,"temperatureF":37,"summary":"Mild"}]
C:\Users\Shraddha Shah>

```

**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();
    }
}

```

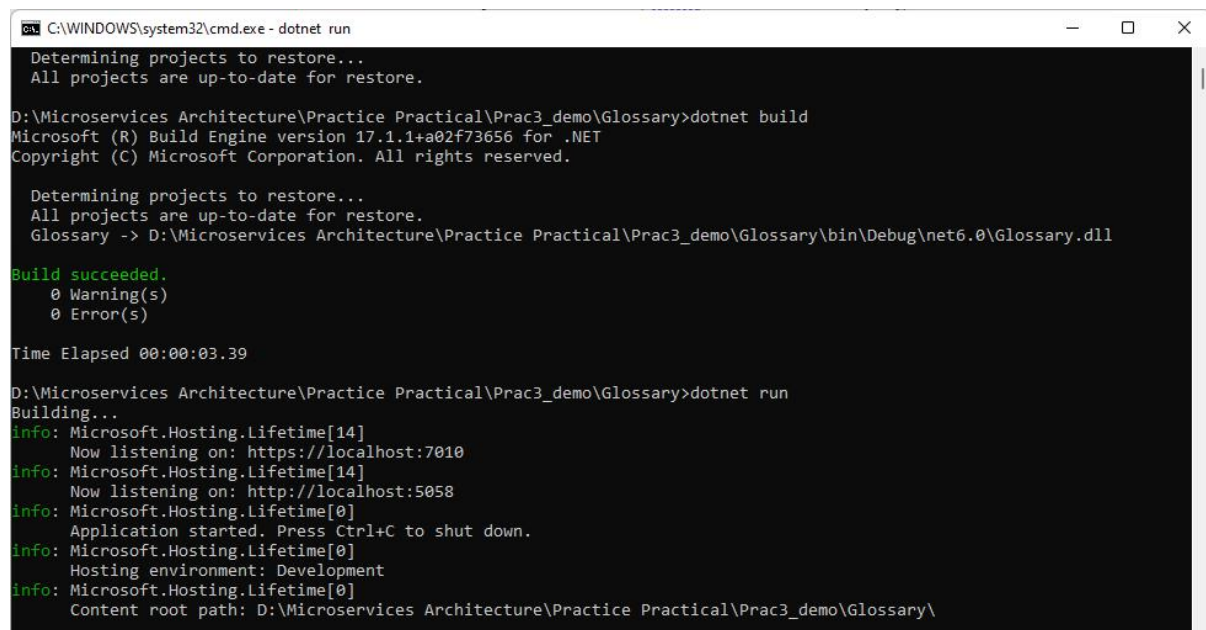
```

[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



```

C:\WINDOWS\system32\cmd.exe - dotnet run
Determining projects to restore...
All projects are up-to-date for restore.

D:\Microservices Architecture\Practice Practical\Prac3_demo\Glossary>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.
Glossary -> D:\Microservices Architecture\Practice Practical\Prac3_demo\Glossary\bin\Debug\net6.0\Glossary.dll

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

Time Elapsed 00:00:03.39

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\

```

## 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`

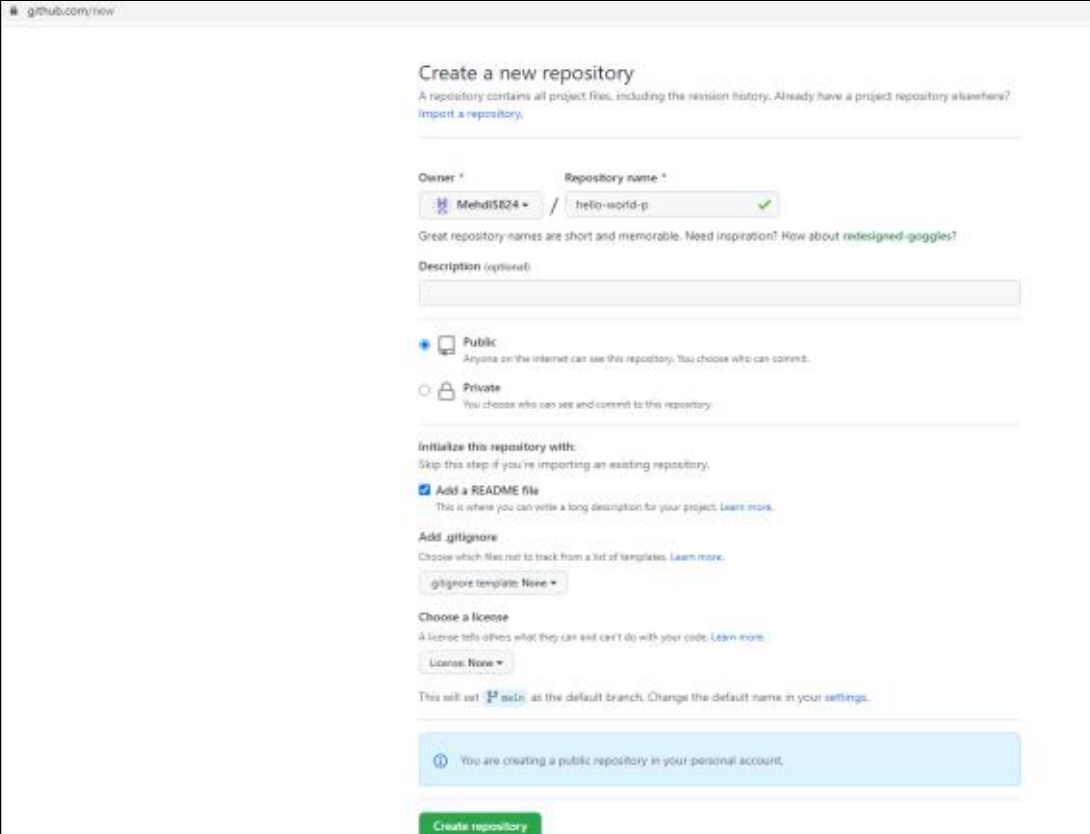
## Practical No 6

**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.



github.com/new

### Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)

Owner \* Mehdi5624 / Repository name \* hello-world-p ✓

Great repository names are short and memorable. Need inspiration? [How about redesigned-goggles?](#)

Description (optional)

☒ Public  
Anyone on the internet can see this repository. You choose who can commit.

☐ Private  
You choose who can see and commit to this repository.

Initialize this repository with:

Skip this step if you're importing an existing repository.

☒ Add a README file  
This is where you can write a long description for your project. [Learn more.](#)

Add .gitignore

Choose which files not to track from a list of templates. [Learn more.](#)

.gitignore template: None

Choose a license

A license tells others what they can and can't do with your code. [Learn more.](#)

License: None

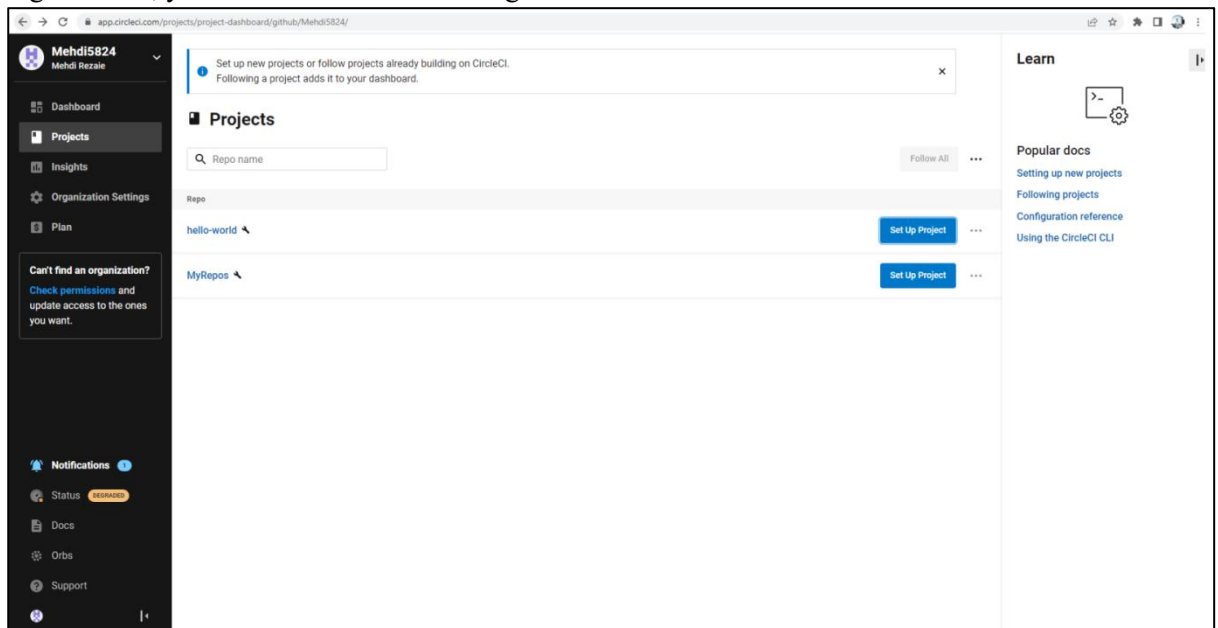
This will set main as the default branch. Change the default name in your [settings](#).

ⓘ You are creating a public repository in your personal account.

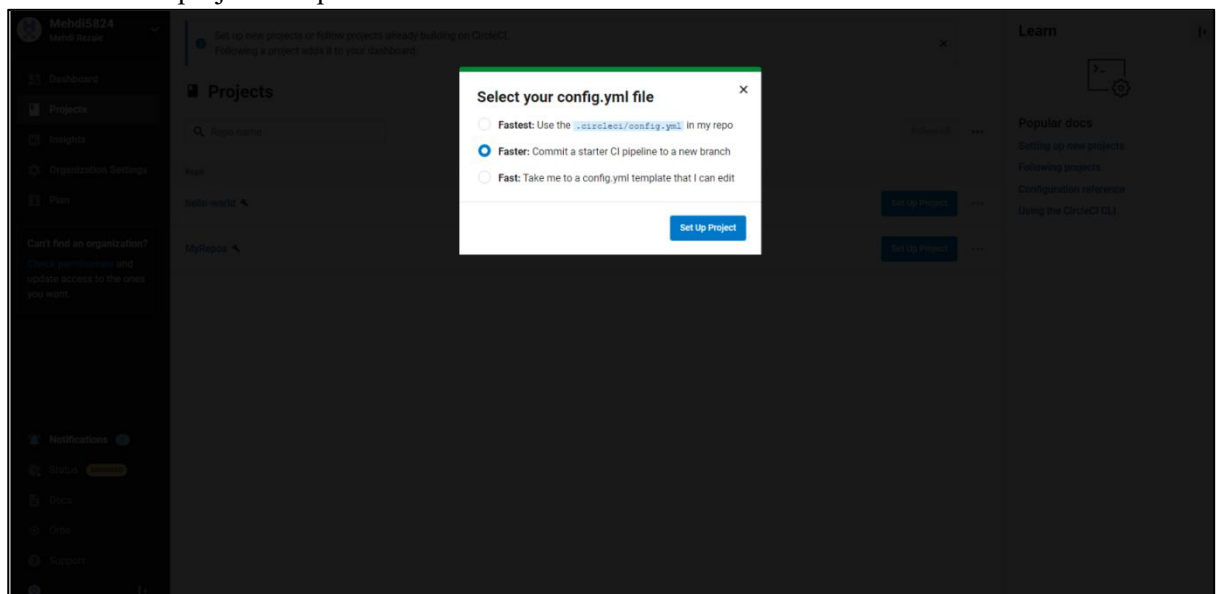
[Create repository](#)

## 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.



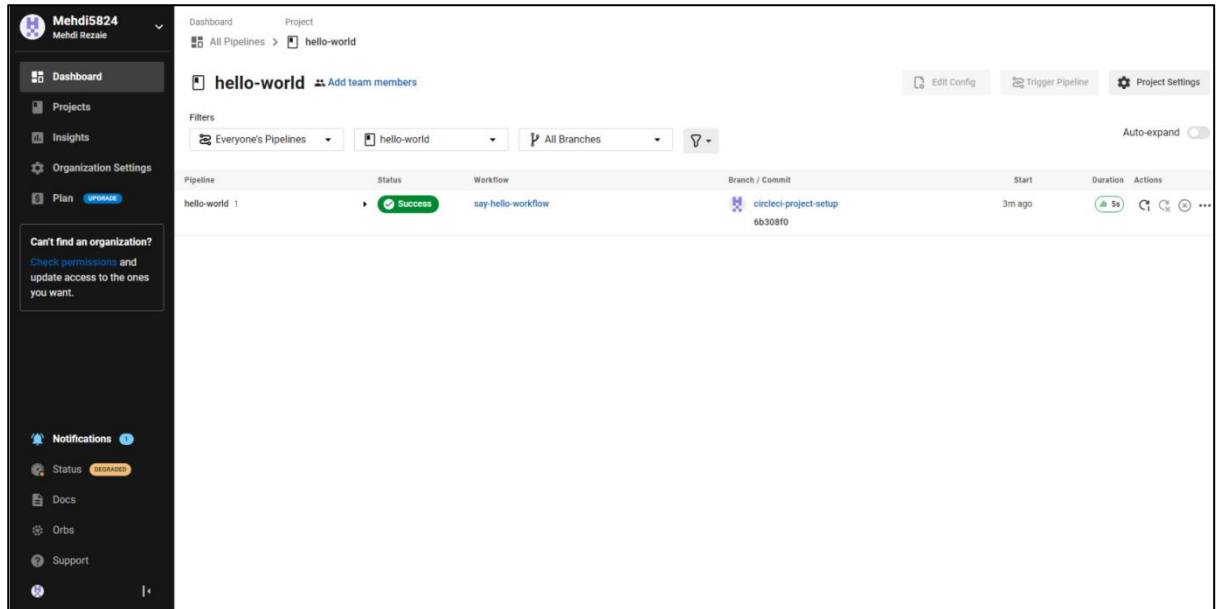
- You will be taken to the Projects dashboard. On the dashboard, select the project you want to set up (hello-world).
- Select the option to commit a starter CI pipeline to a new branch, and click Set Up Project. This will create a file `.circleci/config.yml` at the root of your repository on a new branch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



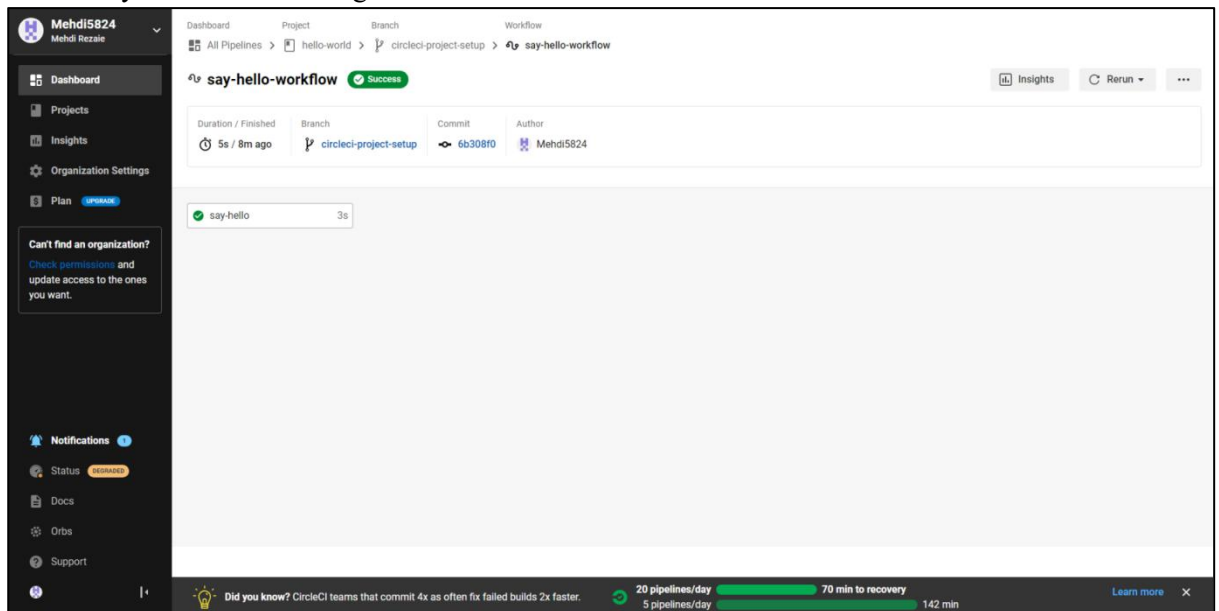
## Step 3: Your first pipeline

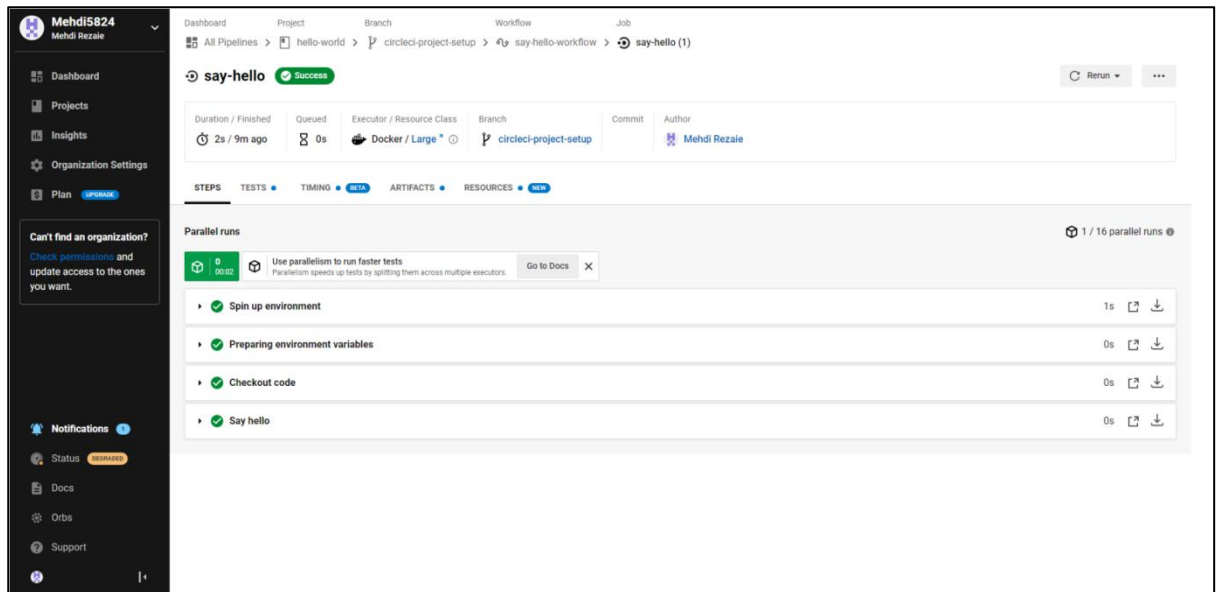
- On your project's pipeline page, click the green Success button, which brings you to the workflow that ran (say-helloworld).

- 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”

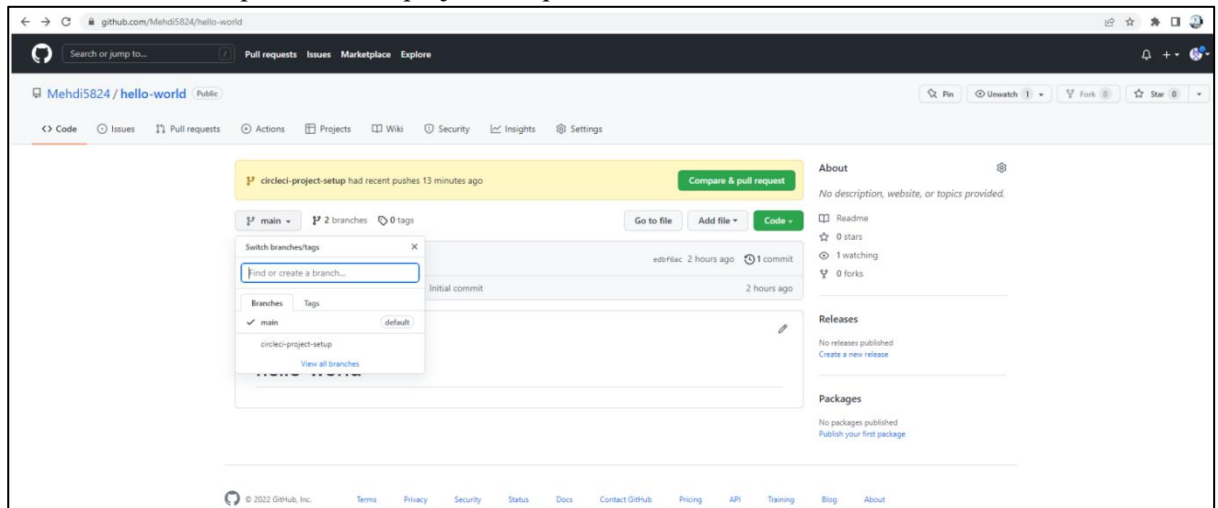


- Select “say-hello” Job with a green tick





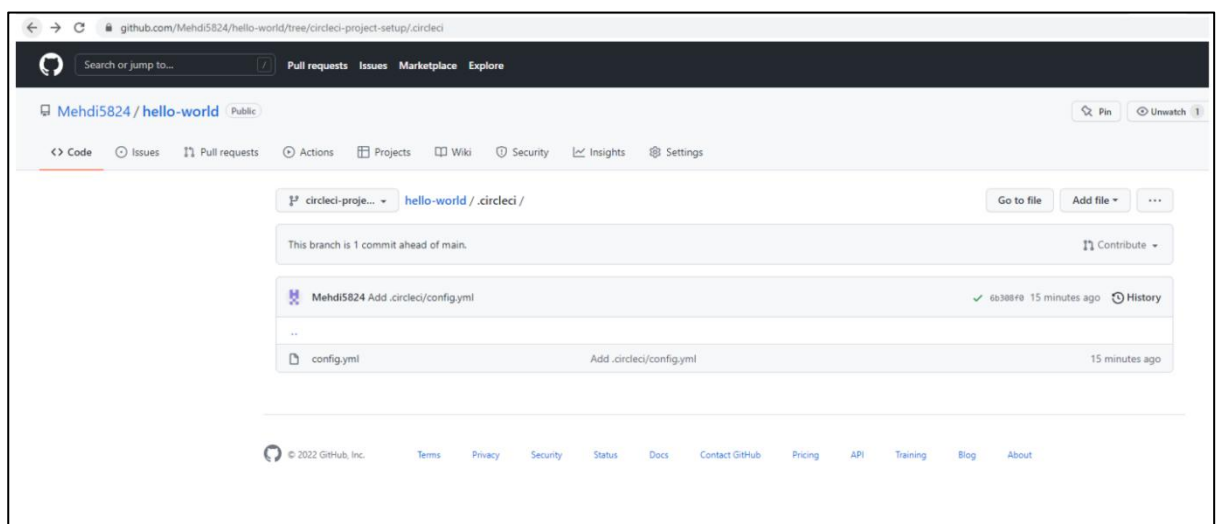
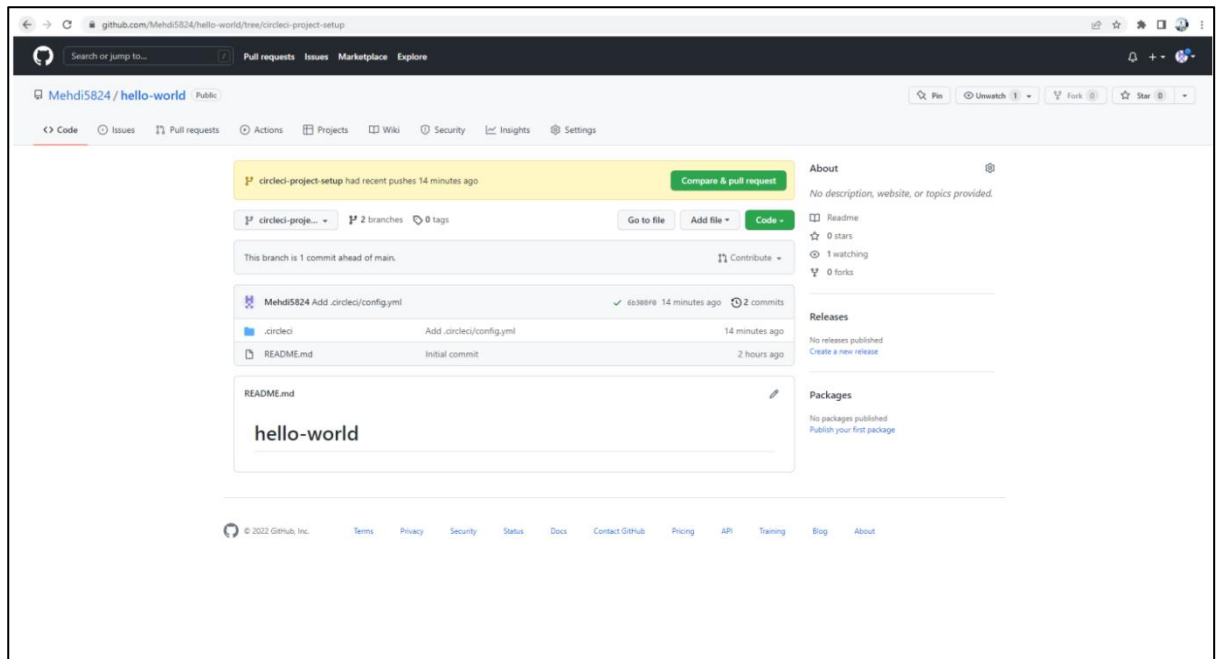
- Select Branch and option circleci-project-setup

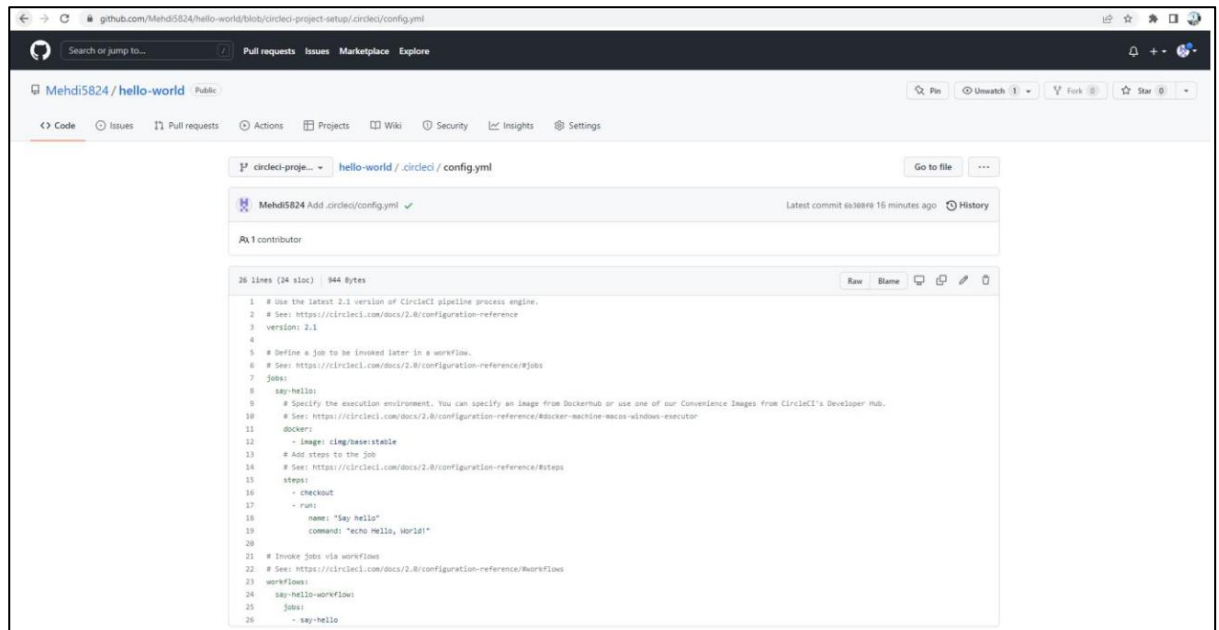


#### Step 4: Break your build

- 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.





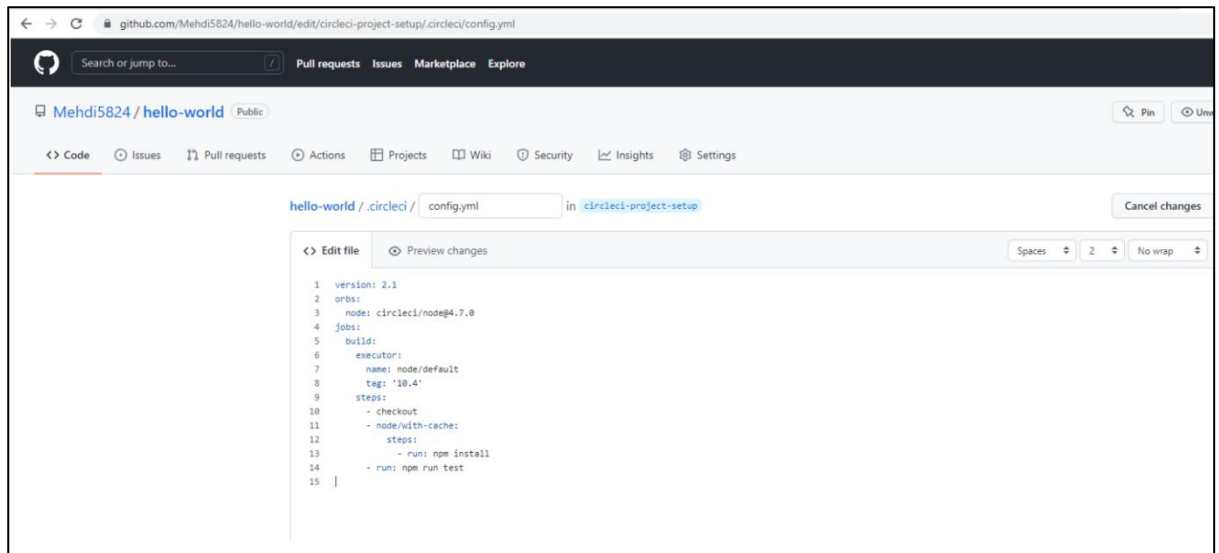


Let's use the [Node orb](#). Replace the existing config by pasting the following code:

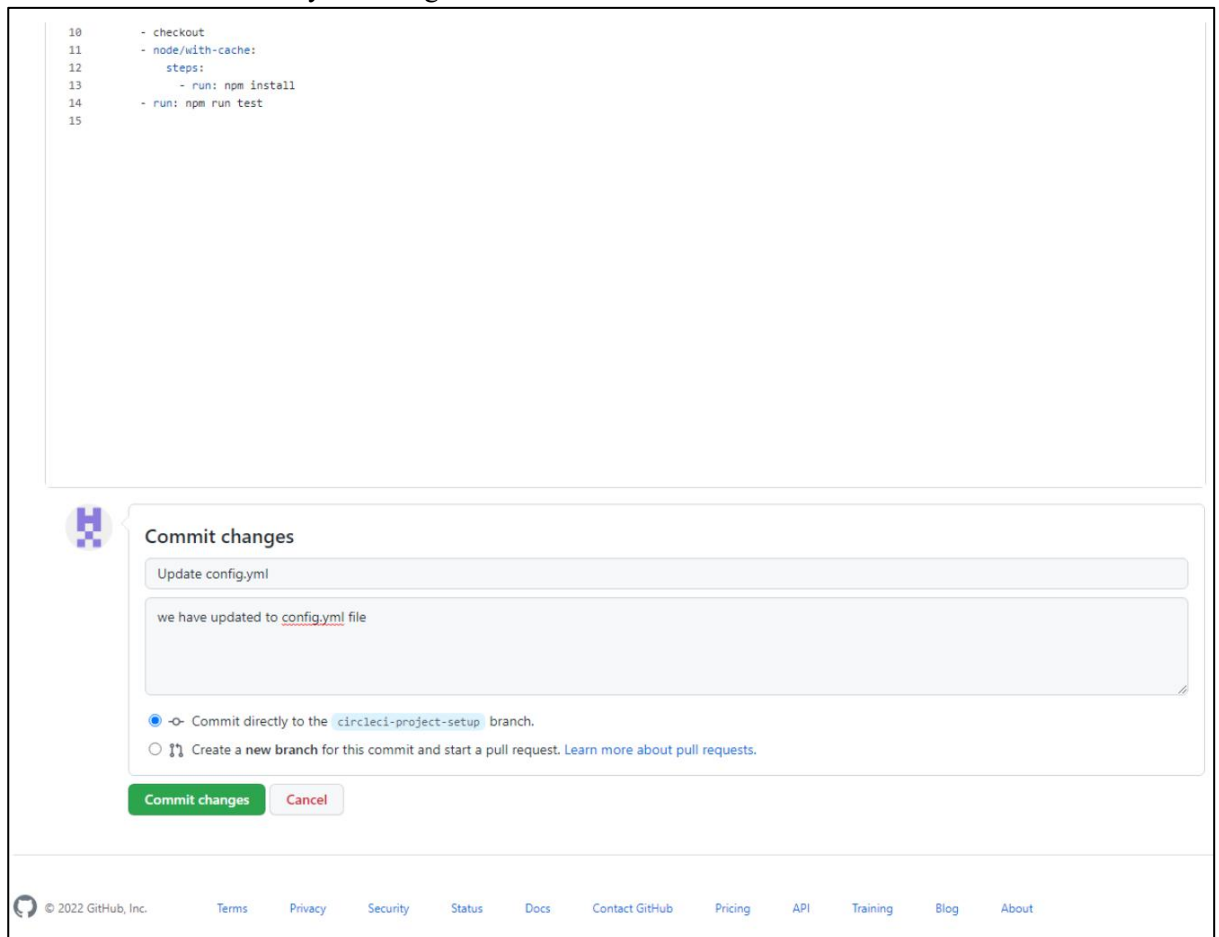
```

1  version: 2.1
2  orbs:
3    node: circleci/node@4.7.0
4  jobs:
5    build:
6      executor:
7        name: node/default
8        tag: '10.4'
9      steps:
10       - checkout
11       - node/with-cache:
12         steps:
13           - run: npm install
14           - run: npm run test
  
```

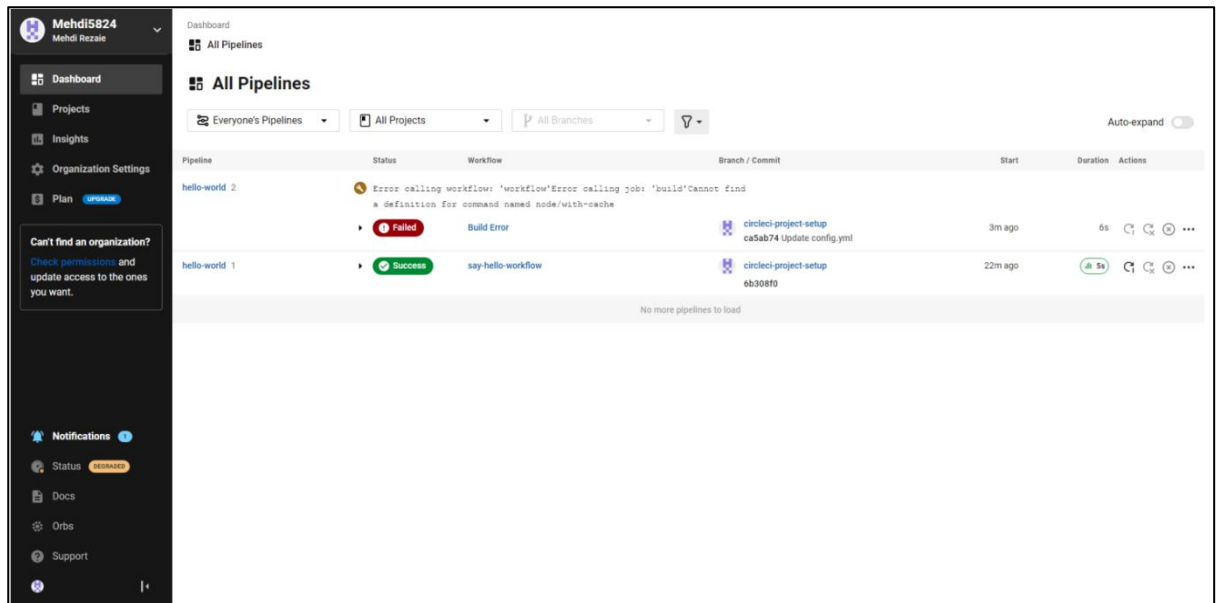
The GitHub file editor should look like this



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.

```
1  version: 2
2  jobs: # we now have TWO jobs, so that a workflow can coordinate them!
3    one: # This is our first job.
4      docker: # it uses the docker executor
5        - image: cimg/ruby:2.6.8 # specifically, a docker image with ruby 2.6.8
6          auth:
7            username: mydockerhub-user
8            password: $DOCKERHUB_PASSWORD # context / project UI env-var reference
9        # Steps are a list of commands to run inside the docker container above.
10       steps:
11         - checkout # this pulls code down from GitHub
12         - run: echo "A first hello" # This prints "A first hello" to stdout.
13         - run: sleep 25 # a command telling the job to "sleep" for 25 seconds.
14     two: # This is our second job.
15       docker: # it runs inside a docker image, the same as above.
16         - image: cimg/ruby:3.0.2
17           auth:
18             username: mydockerhub-user
19             password: $DOCKERHUB_PASSWORD # context / project UI env-var reference
20       steps:
21         - checkout
22         - run: echo "A more familiar hi" # We run a similar echo command to above.
23         - run: sleep 15 # and then sleep for 15 seconds.
24     # Under the workflows: map, we can coordinate our two jobs, defined above.
25   workflows:
26     version: 2
27     one_and_two: # this is the name of our workflow
28       jobs: # and here we list the jobs we are going to run.
29         - one
30         - 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.

```

1 version: 2
2 jobs: # we now have TWO jobs, so that a workflow can coordinate them!
3   one: # This is our first job.
4     docker: # it uses the docker executor
5       - image: cimg/ruby:2.6.8 # specifically, a docker image with ruby 2.6.8
6         auth:
7           username: mydockerhub-user
8           password: $DOCKERHUB_PASSWORD # context / project UI env-var reference
9     # Steps are a list of commands to run inside the docker container above.
10    steps:
11      - checkout # this pulls code down from GitHub
12      - run: echo "A first hello" # This prints "A first hello" to stdout.
13      - run: sleep 25 # a command telling the job to "sleep" for 25 seconds.
14    two: # This is our second job.
15      docker: # it runs inside a docker image, the same as above.
16        - image: cimg/ruby:3.0.2
17          auth:
18            username: mydockerhub-user
19            password: $DOCKERHUB_PASSWORD # context / project UI env-var reference
20      steps:
21        - checkout
22        - run: echo "A more familiar hi!" # We run a similar echo command to above.
23        - run: sleep 15 # and then sleep for 15 seconds.
24    # Under the workflows: map, we can coordinate our two jobs, defined above.
25    workflows:
26      version: 2
27      one_and_two: # this is the name of our workflow
28        jobs: # and here we list the jobs we are going to run.
29          - one
30          - two
  
```

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

| Pipeline      | Status  | Workflow   | Branch / Commit                                     | Start   | Duration | Actions     |
|---------------|---------|--|---|---------|----------|-------------|
| hello-world 3 | Running | one_and_two  | circleci-project-setup<br>e11ad95 Update config.yml | 14s ago | 13s      | 🔄 📄 ⏸️ ⏹️ ⋮ |
| hello-world 2 | Failed  | Error calling workflow: 'workflow'Error calling job: 'build'Cannot find a definition for command named node-with-cmake | circleci-project-setup<br>ca5ab74 Update config.yml | 9m ago  | 6s       | 🔄 📄 ⏸️ ⏹️ ⋮ |
| hello-world 1 | Success | say-hello-workflow   | circleci-project-setup<br>6b308f0                   | 29m ago | 4.5s     | 🔄 📄 ⏸️ ⏹️ ⋮ |

**one\_and\_two** ✔ Success

| Duration / Finished | Branch                   | Commit    | Author & Message    |
|---------------------|--------------------------|-----------|---------------------|
| 🕒 34s / 3s ago      | 🌿 circleci-project-setup | 🔑 e11ad95 | 👤 Update config.yml |

|       |     |
|-------|-----|
| ✔ two | 19s |
| ✔ one | 31s |

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

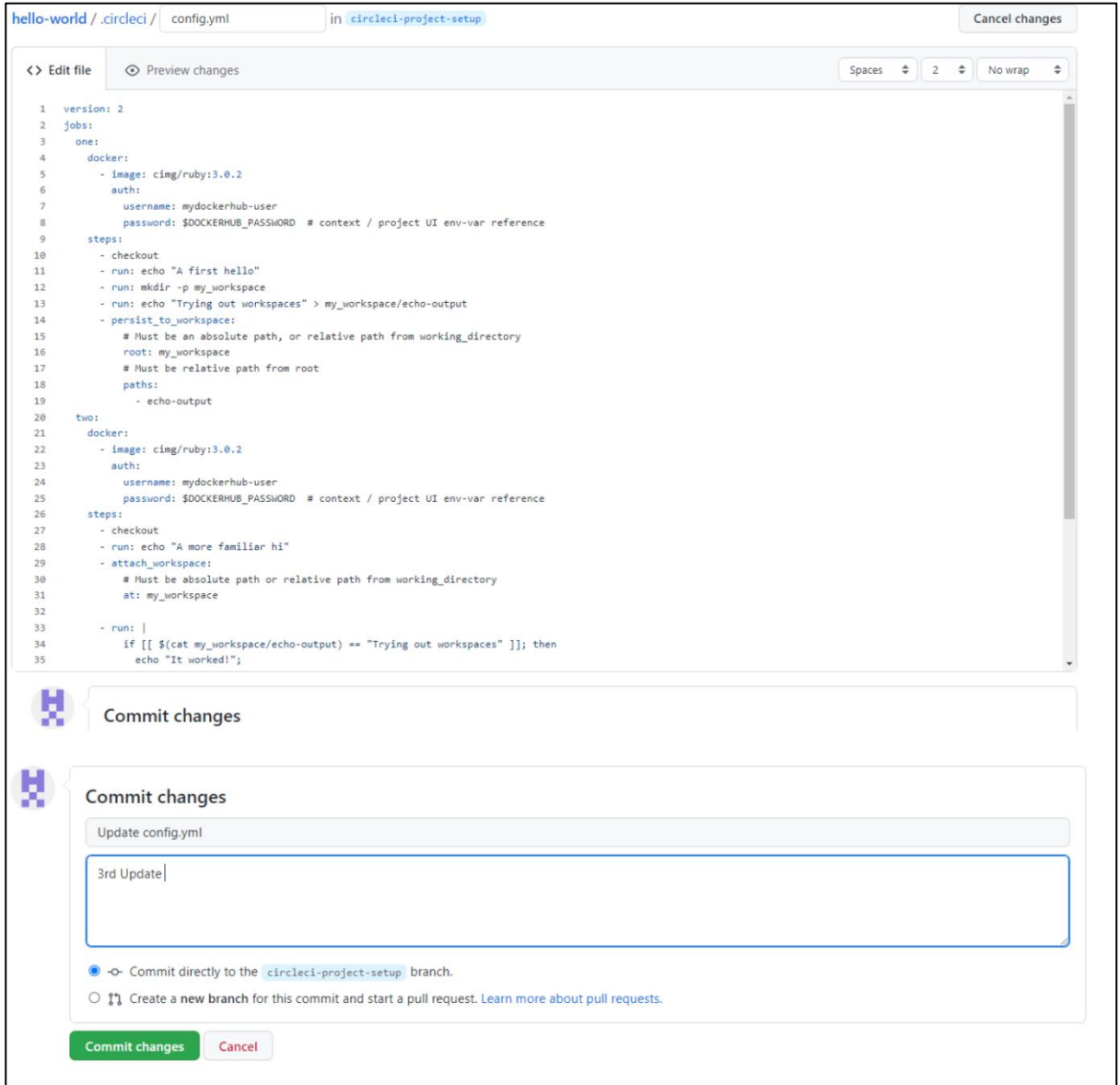
- Each workflow has an associated workspace which can be used to transfer files to downstream jobs as the workflow progresses. You can use workspaces to pass along data that is unique to this run and which is needed for downstream jobs. Try updating config.yml to the following:

```

1  version: 2
2  jobs:
3    one:
4      docker:
5        - image: cimg/ruby:3.0.2
6          auth:
7            username: mydockerhub-user
8            password: $DOCKERHUB_PASSWORD # context / project UI env-var reference
9      steps:
10       - checkout
11       - run: echo "A first hello"
12       - run: mkdir -p my_workspace
13       - run: echo "Trying out workspaces" > my_workspace/echo-output
14       - persist_to_workspace:
15         # Must be an absolute path, or relative path from working_directory
16         root: my_workspace
17         # Must be relative path from root
18         paths:
19           - echo-output
20    two:
21      docker:
22        - image: cimg/ruby:3.0.2
23          auth:
24            username: mydockerhub-user
25            password: $DOCKERHUB_PASSWORD # context / project UI env-var reference
26      steps:
27       - checkout
28       - run: echo "A more familiar hi"
29       - attach_workspace:
30         # Must be absolute path or relative path from working_directory
31         at: my_workspace
32
33       - run: |
34         if [[ $(cat my_workspace/echo-output) == "Trying out workspaces" ]]; then
35           echo "It worked!";
36         else
37           echo "Nope!"; exit 1
38         fi
39  workflows:
40    version: 2
41    one_and_two:
42      jobs:
43        - one
44        - two:
45          requires:
46            - one

```

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



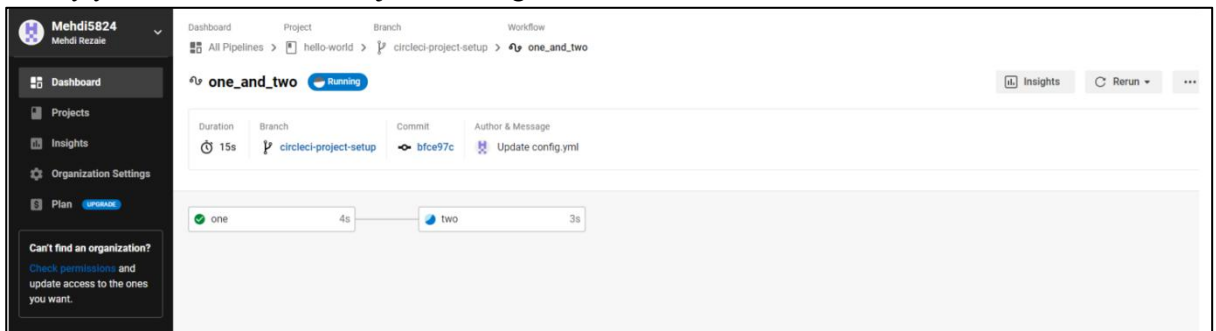
The screenshot shows the GitHub file editor interface for the file `config.yml` in the `circleci-project-setup` branch. The file content is as follows:

```

1 version: 2
2 jobs:
3   one:
4     docker:
5       - image: cimg/ruby:3.0.2
6       auth:
7         username: mydockerhub-user
8         password: $DOCKERHUB_PASSWORD # context / project UI env-var reference
9     steps:
10      - checkout
11      - run: echo "A first hello"
12      - run: mkdir -p my_workspace
13      - run: echo "Trying out workspaces" > my_workspace/echo-output
14      - persist_to_workspace:
15        # Must be an absolute path, or relative path from working_directory
16        root: my_workspace
17        # Must be relative path from root
18        paths:
19          - echo-output
20      two:
21        docker:
22          - image: cimg/ruby:3.0.2
23          auth:
24            username: mydockerhub-user
25            password: $DOCKERHUB_PASSWORD # context / project UI env-var reference
26        steps:
27          - checkout
28          - run: echo "A more familiar hi"
29          - attach_workspace:
30            # Must be absolute path or relative path from working_directory
31            at: my_workspace
32          - run: |
33              if [[ $(cat my_workspace/echo-output) == "Trying out workspaces" ]]; then
34                echo "It worked!";
35  
```

Below the file editor, the "Commit changes" dialog is open. It shows the commit message "Update config.yml" and a text area containing "3rd Update". The dialog also includes options to "Commit directly to the circleci-project-setup branch" (selected) or "Create a new branch for this commit and start a pull request". The "Commit changes" button is highlighted in green.

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



The screenshot shows the GitHub Actions workflow view for the `one_and_two` workflow. The workflow is currently running, as indicated by the "Running" status. The workflow consists of two jobs: `one` and `two`. Job `one` has a duration of 15s and job `two` has a duration of 3s. The workflow is triggered by a push to the `circleci-project-setup` branch. The commit hash is `bfce97c` and the author is `Update config.yml`. The workflow is currently running on the `one_and_two` branch.



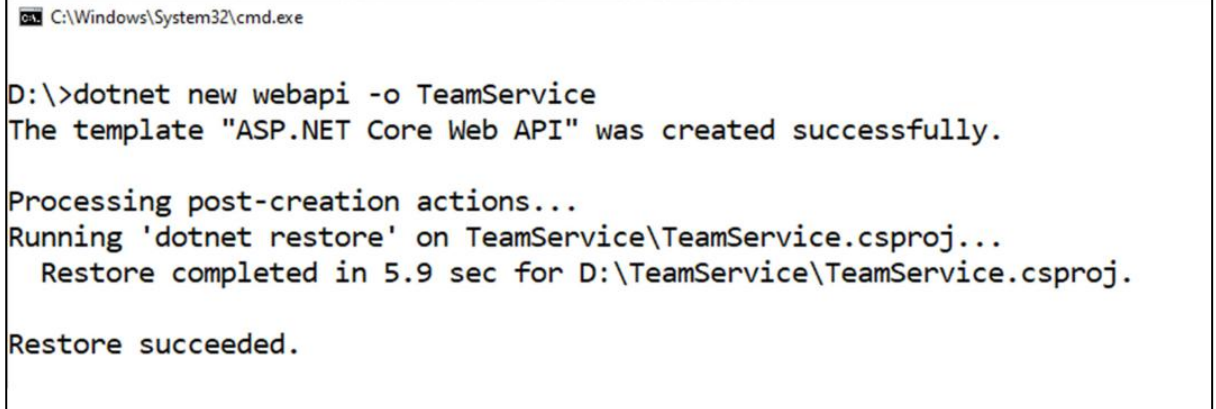
## Practical No 7

**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 ITeamRepository.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;
        }
    }
}
```

```

        {
            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-9e54-7aab04286281","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-9e54-7aab04286281","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":"e12baa63-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-9e54-7aab04286281","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:\>
```