

# DISTRIBUTED SYSTEMS – PROJECT – 3 – README FILE

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## *TWO-PHASE DISTRIBUTED COMMIT PROTOCOL*

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Project By:

Koushik Kondepati (1002069104)

Sai Narayana Shanmukh Ayyagari (1002063350)

Instructor:

Md Hasanuzzaman Noor

## Motivation:

A good programmer writes quality code and makes others understand by adding additional comments. Therefore, we ensure that all the technologies used in this project are taken with utmost concern and that they give us the desired output.

## Technologies used:

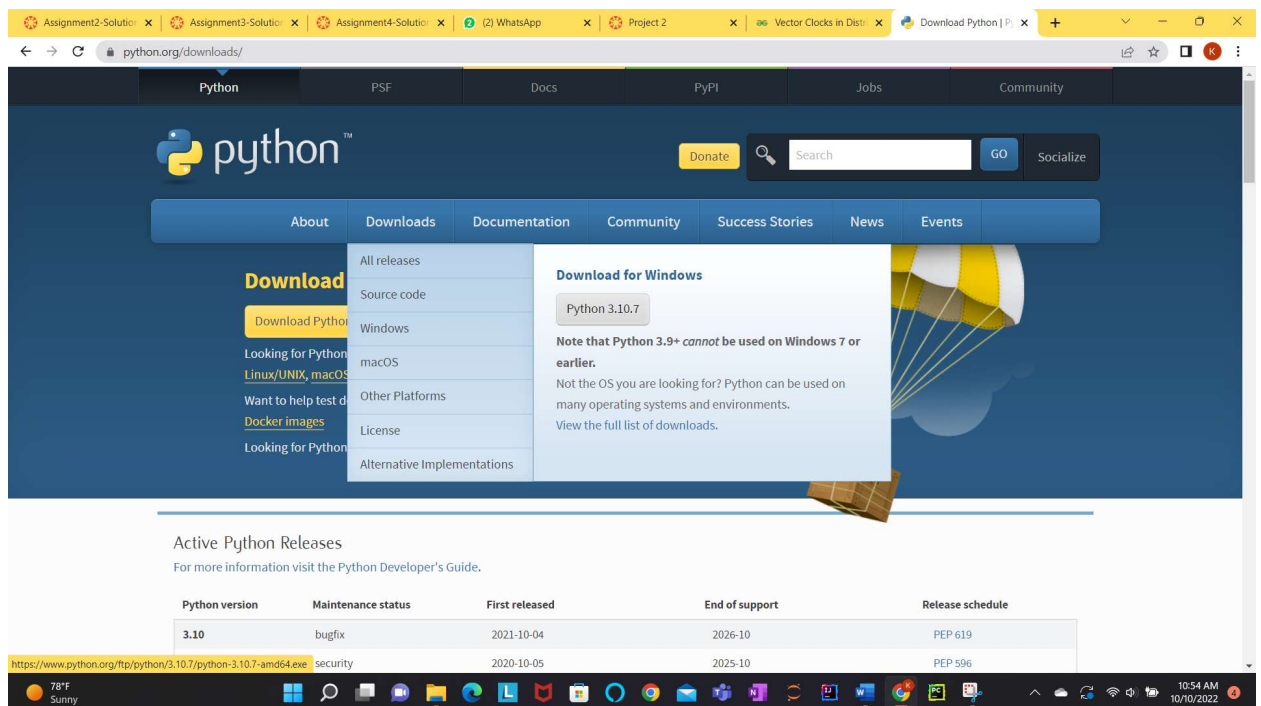
- 1) Python
- 2) VS-CODE
- 3) RPC
- 4) Pathlib package
- 5) Datetime package
- 6) Func-timeout package

## Python download:

"Python" is one of the world's best and fastest growing programming languages that exist so far. It is not mandatory to use python, depending on their taste, but in our project, we decided to use python as we can find it is more efficient in importing socket, threading packages from python. Steps will be given below on how to install python.

## Steps to install:

- 1) Click on python 3.10.7 download for windows button and finish the final steps to install.



The screenshot shows the Python.org website with the 'Downloads' menu open. The 'Download for Windows' section is highlighted, showing the 'Python 3.10.7' download button. A note states: 'Note that Python 3.9+ cannot be used on Windows 7 or earlier. Not the OS you are looking for? Python can be used on many operating systems and environments. View the full list of downloads.'

Below the download section, the 'Active Python Releases' table is visible:

Python version	Maintenance status	First released	End of support	Release schedule
3.10	bugfix	2021-10-04	2026-10	PEP 619
3.9	security	2020-10-05	2025-10	PEP 596

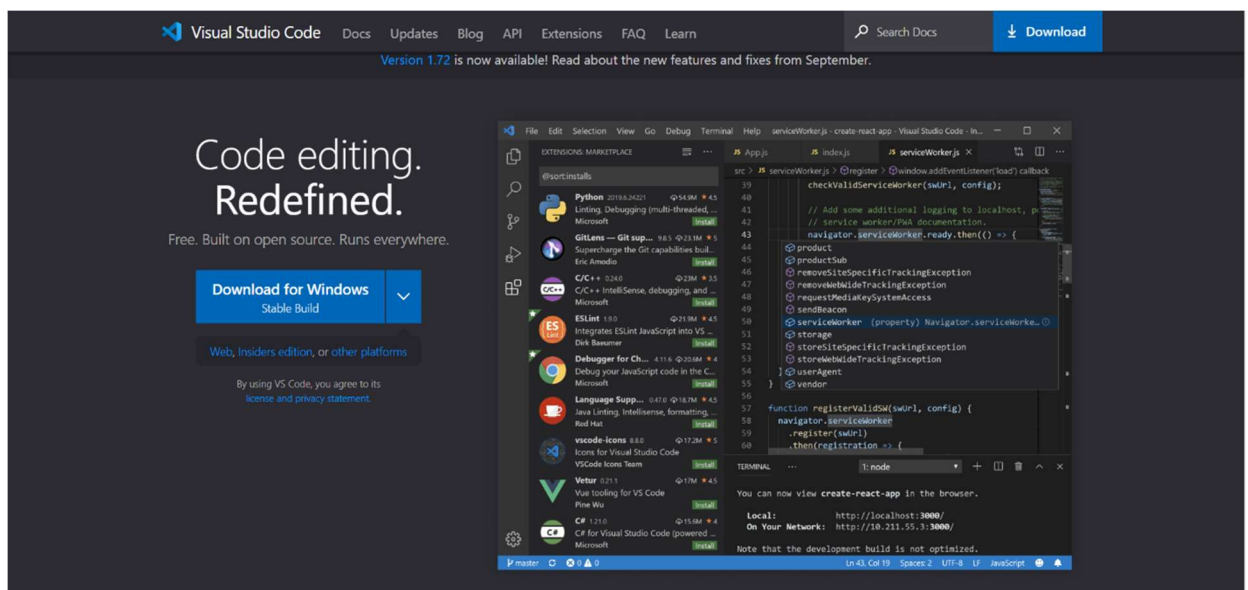
- 2) Now after downloading the java jdk file, we need to install it in our system successfully and need to set the path by changing the path inside environment variable.

## VS-CODE:

A good idea will play a significant role in building the project; one such good idea we used in our project is the "VS-CODE."

Steps to download:

- 1) Download the free community version if you are on the windows system as it is free and open source.



## 2-PHASE DISTRIBUTED COMMIT PROTOCOL:

2-PHASE distributed system protocol we are using transaction coordinator and two others processes which we call as node1 and node2.

# 1-TC FAILURE

```
C:\> Command Prompt

Microsoft Windows [Version 10.0.22000.1098]
(c) Microsoft Corporation. All rights reserved.

C:\Users\shanm>cd C:\Users\shanm\OneDrive\Desktop\dsproj3

C:\Users\shanm\OneDrive\Desktop\dsproj3>python cord.py
Connected----->Node1
Connected----->Node2
Prepared----->sent to Node 1.
awaiting----->vote...
Prepared----->sent to Node 2.
awaiting----->vote...
Node1 responded with a no, or it took too long. Aborting the transaction as a result
Transaction----->Aborted
Node2 responded with a no, or it took too long. Aborting the transaction as a result
Transaction----->Aborted
```

## TC-FAILURE LOG FILE

```
Connected----->Node101-11-2022 21:27:19
Connected----->Node201-11-2022 21:27:19
Prepared----->sent to Node 1.01-11-2022 21:27:34
awaiting----->vote...01-11-2022 21:27:34
Prepared----->sent to Node 2.01-11-2022 21:27:36
awaiting----->vote...01-11-2022 21:27:36
Node1 responded with a no, or it took too long. Aborting the transaction as a result01-11-2022 21:27:38
Transaction----->Aborted01-11-2022 21:27:38
Connected----->Node101-11-2022 21:27:19
Connected----->Node201-11-2022 21:27:19
Prepared----->sent to Node 1.01-11-2022 21:27:34
awaiting----->vote...01-11-2022 21:27:34
Prepared----->sent to Node 2.01-11-2022 21:27:36
awaiting----->vote...01-11-2022 21:27:36
Node1 responded with a no, or it took too long. Aborting the transaction as a result01-11-2022 21:27:38
Transaction----->Aborted01-11-2022 21:27:38
Node2 responded with a no, or it took too long. Aborting the transaction as a result01-11-2022 21:27:42
Transaction----->Aborted01-11-2022 21:27:42
```

## Node1

```
C:\> Command Prompt - python n1.py

Microsoft Windows [Version 10.0.22000.1098]
(c) Microsoft Corporation. All rights reserved.

C:\Users\shanm>cd C:\Users\shanm\OneDrive\Desktop\dsproj3

C:\Users\shanm\OneDrive\Desktop\dsproj3>python n1.py
Node1----->Active
linked----->coordinator
Preparation----->Awaiting...
127.0.0.1 - - [01/Nov/2022 21:27:21] "POST /RPC2 HTTP/1.1" 200 -
Coordinator----->didn't send prepare yet.... so----->aborting
Transaction----->Aborted
Sent----->no to prepare...coordinator-----> too long to send prepare
127.0.0.1 - - [01/Nov/2022 21:27:36] "POST /RPC2 HTTP/1.1" 200 -
127.0.0.1 - - [01/Nov/2022 21:27:40] "POST /RPC2 HTTP/1.1" 200 -
127.0.0.1 - - [01/Nov/2022 21:27:44] "POST /RPC2 HTTP/1.1" 200 -
```

## Node-1 LOG FILE

```
linked----->coordinator01-11-2022 21:27:21
Preparation----->Awaiting...01-11-2022 21:27:21
Coordinator----->didnt send prepare yet.... so----->aborting01-11-2022 21:27:36
Transaction----->Aborted01-11-2022 21:27:36
Sent----->no to prepare....coordinator-----> too long to send prepare01-11-2022 21:27:36
```

## Node2

```
Command Prompt - python n2.py
Microsoft Windows [Version 10.0.22000.1098]
(c) Microsoft Corporation. All rights reserved.

C:\Users\shanm>cd C:\Users\shanm\OneDrive\Desktop\dsproj3

C:\Users\shanm\OneDrive\Desktop\dsproj3>python n2.py
Node2----->Active
linked----->coordinator
Preparation----->Awaiting...
127.0.0.1 - - [01/Nov/2022 21:27:23] "POST /RPC2 HTTP/1.1" 200 -
Coordinator----->didnt send prepare yet.... so----->aborting
Transaction----->Aborted
Sent----->no to prepare....coordinator-----> too long to send prepare
127.0.0.1 - - [01/Nov/2022 21:27:38] "POST /RPC2 HTTP/1.1" 200 -
127.0.0.1 - - [01/Nov/2022 21:27:42] "POST /RPC2 HTTP/1.1" 200 -
127.0.0.1 - - [01/Nov/2022 21:27:46] "POST /RPC2 HTTP/1.1" 200 -
```

## Node2 LOG FILE

```
linked----->coordinator01-11-2022 21:27:23
Preparation----->Awaiting...01-11-2022 21:27:23
Coordinator----->didnt send prepare yet.... so----->aborting01-11-2022 21:27:38
Transaction----->Aborted01-11-2022 21:27:38
Sent----->no to prepare....coordinator-----> too long to send prepare01-11-2022 21:27:38
```

## 2-NODE FAILURE TC OUTPUT

```
Command Prompt
C:\Users\shanm\OneDrive\Desktop\dsproj3>python cord.py
Connected----->Node1
Connected----->Node2
Prepared----->sent to Node 1.
awaiting----->vote...
Prepared----->sent to Node 2.
awaiting----->vote...
Node1 responded with a no, or it took too long. Aborting the transaction as a result
Transaction----->Aborted
Transaction----->Aborted
Obtaining----->yes from Node2
```



## NODE1 CODE

```
Command Prompt - python n1.py

C:\Users\shanm\OneDrive\Desktop\dsproj3>python n1.py
Node1----->Active
linked----->coordinator
Preparation----->Awaiting...
127.0.0.1 - - [01/Nov/2022 22:54:00] "POST /RPC2 HTTP/1.1" 200 -
received----->preparation
Sent Yes after----->11.006381750106812 seconds
Voting took far too long... Transaction----->Aborting.
127.0.0.1 - - [01/Nov/2022 22:54:16] "POST /RPC2 HTTP/1.1" 200 -
```

## NODE2 CODE

```
Command Prompt - python n2.py

C:\Users\shanm\OneDrive\Desktop\dsproj3>python n2.py
Node2----->Active
linked----->coordinator
Preparation----->Awaiting...
127.0.0.1 - - [01/Nov/2022 22:54:02] "POST /RPC2 HTTP/1.1" 200 -
received----->preparation
Sent Yes after----->1.0148890018463135 seconds
awaiting----->Commit...
127.0.0.1 - - [01/Nov/2022 22:54:16] "POST /RPC2 HTTP/1.1" 200 -
```

## BONUS-1 CASE:

## TC CHECKING WITH LOG FILES

```
Connected----->Node101-11-2022 22:10:45
Connected----->Node201-11-2022 22:10:45
Prepared----->sent to Node 1.01-11-2022 22:10:50
awaiting----->vote...01-11-2022 22:10:50
Prepared----->sent to Node 2.01-11-2022 22:10:53
awaiting----->vote...01-11-2022 22:10:53
Obtaining----->yes from Node101-11-2022 22:10:56
Obtaining----->yes from Node101-11-2022 22:10:56
Proceeding----->Transaction01-11-2022 22:10:56
FinalizeCommit----->received from node1 01-11-2022 22:10:59
sent commit----->Node1, so sending node201-11-2022 22:11:10
FinalizeCommit----->received from node2 01-11-2022 22:11:13
Transaction----->Successful01-11-2022 22:11:13
```

## BONUS-2 CASE:

### NODE CHECKING WITH LOG FILES

#### NODE1 LOG

```
linked----->coordinator01-11-2022 22:16:19
Preparation----->Awaiting...01-11-2022 22:16:19
Commit----->Received01-11-2022 22:16:30
slept too much after the request01-11-2022 22:16:41
Connected----->Node101-11-2022 22:16:17
Connected----->Node201-11-2022 22:16:17
Prepared----->sent to Node 1.01-11-2022 22:16:22
awaiting----->vote...01-11-2022 22:16:22
Prepared----->sent to Node 2.01-11-2022 22:16:25
awaiting----->vote...01-11-2022 22:16:25
Obtaining----->yes from Node101-11-2022 22:16:28
Obtaining----->yes from Node101-11-2022 22:16:28
Proceeding----->Transaction01-11-2022 22:16:28
FinalizeCommit----->received from node1 01-11-2022 22:16:41
sent commit----->Node1, so sending node201-11-2022 22:16:42
FinalizeCommit----->received from node2 01-11-2022 22:16:55
Transaction----->Successful01-11-2022 22:16:55
I waited too long to send the commit, thus I'm asking TC for transaction details.01-11-2022 22:16:57
-----Begin----->transaction information-----01-11-2022 22:16:57
-----End----->transaction information-----01-11-2022 22:16:57
Transaction----->Successful01-11-2022 22:16:57
```

#### NODE2 LOG

```
linked----->coordinator01-11-2022 22:16:21
Preparation----->Awaiting...01-11-2022 22:16:21
Commit----->Received01-11-2022 22:16:44
slept too much after the request01-11-2022 22:16:55
Connected----->Node101-11-2022 22:16:17
Connected----->Node201-11-2022 22:16:17
Prepared----->sent to Node 1.01-11-2022 22:16:22
awaiting----->vote...01-11-2022 22:16:22
Prepared----->sent to Node 2.01-11-2022 22:16:25
awaiting----->vote...01-11-2022 22:16:25
Obtaining----->yes from Node101-11-2022 22:16:28
Obtaining----->yes from Node101-11-2022 22:16:28
Proceeding----->Transaction01-11-2022 22:16:28
FinalizeCommit----->received from node1 01-11-2022 22:16:41
sent commit----->Node1, so sending node201-11-2022 22:16:42
FinalizeCommit----->received from node2 01-11-2022 22:16:55
Transaction----->Successful01-11-2022 22:16:55
I waited too long to send the commit, thus I'm asking TC for transaction details.01-11-2022 22:16:59
-----Begin----->transaction information-----01-11-2022 22:16:59
-----End----->transaction information-----01-11-2022 22:16:59
Transaction----->Successful01-11-2022 22:16:59
```

Import xmlrpc

## Project Code Brief:

This program consists of four .py files out of which all files need to be executed which are 1 server code and 2 client code.

- 1) code.py
- 2) Node-1.py
- 3) Node-2.py

The entire project is written by us in PYTHON programming language. This project consists of three programs which are node1 , node2 and co-ordinator.py.

We created these three separate python files, one for coordinator code and the other two for nodes code implementation. So that the user can run both simultaneously and can check in the terminal.



