**Assignment 1 (GitHub)**

**Problem statement:**

ABC Organization would like to opt for the distributed version control system to upgrade their environment, where Git has been selected as the solution. You been assigned as a consultant to educate the migration process to move their Source Code from Centralized to Distributed systems. As a phase one, you would like to go ahead with a workshop to demonstrate below operation to make the ABC team comfortable.

i) Create a Repository

ii) Add Tow Directory and some raw code files to the repository

iii) Move Code from One directory to Another Directory

iv) Update one source code file and display the difference

v) Create a Branch

vi) Add some raw code to the branch

vii) Merge the Branch with Main line

And at the end provide the Summary of advantages of moving from Centralized Source Code to Distributed Version Control.

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| ***GitHub Public profile*** | [**https://github.com/ShelkeAkshay-2022mt93331**](https://github.com/ShelkeAkshay-2022mt93331) |
| ***GitHub Solution Repository*** | [**https://github.com/ShelkeAkshay-2022mt93331/abc-repo**](https://github.com/ShelkeAkshay-2022mt93331/abc-repo) |

**i) Create a Repository :**

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| **GIT Commands from local Git Bash** |
| DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement  $ git config --global user.email "2022mt93331@wilp.bits-pilani.ac.in"  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement  $ git config --global user.name "SHELKE AKSHAY NANDKUMAR - 2022mt93331"  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement  $ mkdir abc-repo  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement  $ cd abc-repo/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo  $ mkdir my\_repository  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo  $ cd my\_repository/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository  $ echo "# xyz" >> README.md  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository  $ git init  Initialized empty Git repository in D:/IntoductionToDevops-Assignement/abc-repo/my\_repository/.git/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (master)  $ git add README.md  warning: in the working copy of 'README.md', LF will be replaced by CRLF the next time Git touches it  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (master)  $ git commit -m "first commit"  [master (root-commit) 6cad0b8] first commit  1 file changed, 1 insertion(+)  create mode 100644 README.md  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (master)  $ git branch -M main  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git remote add origin https://github.com/ShelkeAkshay-2022mt93331/abc-repo.git  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git push -u origin main  Enumerating objects: 3, done.  Counting objects: 100% (3/3), done.  Writing objects: 100% (3/3), 253 bytes | 253.00 KiB/s, done.  Total 3 (delta 0), reused 0 (delta 0), pack-reused 0  To https://github.com/ShelkeAkshay-2022mt93331/abc-repo.git  \* [new branch] main -> main  branch 'main' set up to track 'origin/main'.  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ |

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| **GIT Commands Screenshot from local Git Bash** |
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| **GitHub Repository Created** |
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**ii) Add Tow Directory and some raw code files to the repository**

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| **GIT Commands from local Git Bash** |
| DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ mkdir Tow  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ touch Tow/python\_code\_1.py  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ touch Tow/python\_code\_2.py  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git add Tow/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git status  On branch main  Your branch is up to date with 'origin/main'.  Changes to be committed:  (use "git restore --staged <file>..." to unstage)  new file: Tow/python\_code\_1.py  new file: Tow/python\_code\_2.py  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git commit -m "adding Tow directory and python code files"  [main e1ca78a] adding Tow directory and python code files  2 files changed, 0 insertions(+), 0 deletions(-)  create mode 100644 Tow/python\_code\_1.py  create mode 100644 Tow/python\_code\_2.py  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git remote add origin https://github.com/ShelkeAkshay-2022mt93331/abc-repo.git  error: remote origin already exists.  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git push -u origin main  Enumerating objects: 5, done.  Counting objects: 100% (5/5), done.  Delta compression using up to 8 threads  Compressing objects: 100% (3/3), done.  Writing objects: 100% (4/4), 394 bytes | 394.00 KiB/s, done.  Total 4 (delta 0), reused 0 (delta 0), pack-reused 0  To https://github.com/ShelkeAkshay-2022mt93331/abc-repo.git  6cad0b8..e1ca78a main -> main  branch 'main' set up to track 'origin/main'.  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ |

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| **GIT Commands Screenshot from local Git Bash** |
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| **Tow directory and python code files created in GitHub** |
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**iii) Move Code from One directory to Another Directory**

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| **GIT Commands from local Git Bash** |
| DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ ls  README.md Tow/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ mkdir Tow\_2  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git mv Tow/python\_code\_2.py Tow\_2/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git status  On branch main  Your branch is up to date with 'origin/main'.  Changes to be committed:  (use "git restore --staged <file>..." to unstage)  renamed: Tow/python\_code\_2.py -> Tow\_2/python\_code\_2.py  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git commit -m "move code file from one directory to another directory"  [main da897e9] move code file from one directory to another directory  1 file changed, 0 insertions(+), 0 deletions(-)  rename {Tow => Tow\_2}/python\_code\_2.py (100%)  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git push -u origin main  Enumerating objects: 6, done.  Counting objects: 100% (6/6), done.  Delta compression using up to 8 threads  Compressing objects: 100% (2/2), done.  Writing objects: 100% (4/4), 463 bytes | 463.00 KiB/s, done.  Total 4 (delta 0), reused 0 (delta 0), pack-reused 0  To https://github.com/ShelkeAkshay-2022mt93331/abc-repo.git  e1ca78a..da897e9 main -> main  branch 'main' set up to track 'origin/main'.  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git status  On branch main  Your branch is up to date with 'origin/main'.  nothing to commit, working tree clean  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ |

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| **GIT Commands Screenshot from local Git Bash** |
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| **Moved code file from one directory to another in GitHub** |
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**iv) Update one source code file and display the difference**

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| **GIT Commands from local Git Bash** |
| DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ ls  README.md Tow/ Tow\_2/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ cd Tow  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository/Tow (main)  $ ls  python\_code\_1.py  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository/Tow (main)  $ vim python\_code\_1.py  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository/Tow (main)  $ git diff  warning: in the working copy of 'Tow/python\_code\_1.py', LF will be replaced by CRLF the next time Git touches it  **diff --git a/Tow/python\_code\_1.py b/Tow/python\_code\_1.py**  **index e69de29..6b4929c 100644**  **--- a/Tow/python\_code\_1.py**  **+++ b/Tow/python\_code\_1.py**  @@ -0,0 +1 @@  +print("Introduction to Devops - Assignment GITHUB")  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository/Tow (main)  $ git status  On branch main  Your branch is up to date with 'origin/main'.  Changes not staged for commit:  (use "git add <file>..." to update what will be committed)  (use "git restore <file>..." to discard changes in working directory)  modified: python\_code\_1.py  no changes added to commit (use "git add" and/or "git commit -a")  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository/Tow (main)  $ git add python\_code\_1.py  warning: in the working copy of 'Tow/python\_code\_1.py', LF will be replaced by CRLF the next time Git touches it  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository/Tow (main)  $ git commit -m "making changes in code file and displaying difference"  [main 9a6908b] making changes in code file and displaying difference  1 file changed, 1 insertion(+)  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository/Tow (main)  $ git push -u origin main  Enumerating objects: 7, done.  Counting objects: 100% (7/7), done.  Delta compression using up to 8 threads  Compressing objects: 100% (3/3), done.  Writing objects: 100% (4/4), 472 bytes | 472.00 KiB/s, done.  Total 4 (delta 0), reused 0 (delta 0), pack-reused 0  To https://github.com/ShelkeAkshay-2022mt93331/abc-repo.git  da897e9..9a6908b main -> main  branch 'main' set up to track 'origin/main'. |

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| **GIT Commands Screenshot from local Git Bash** |
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| **Updates in GitHub** |
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**v) Create a Branch**

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| **GIT Commands from local Git Bash** |
| DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ ls  README.md Tow/ Tow\_2/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git branch feature-akshay  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git checkout feature-akshay  Switched to branch 'feature-akshay'  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ ls  README.md Tow/ Tow\_2/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ ls  README.md Tow/ Tow\_2/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ mkdir Tow\_3  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ touch Tow\_3/python\_code\_3.py  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ ls  README.md Tow/ Tow\_2/ Tow\_3/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ git add Tow\_3  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ git commit -m "committing code file to feature branch"  [feature-akshay 6aed72e] committing code file to feature branch  1 file changed, 0 insertions(+), 0 deletions(-)  create mode 100644 Tow\_3/python\_code\_3.py  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ git push -u origin feature-akshay  Enumerating objects: 5, done.  Counting objects: 100% (5/5), done.  Delta compression using up to 8 threads  Compressing objects: 100% (2/2), done.  Writing objects: 100% (4/4), 371 bytes | 371.00 KiB/s, done.  Total 4 (delta 1), reused 0 (delta 0), pack-reused 0  remote: Resolving deltas: 100% (1/1), completed with 1 local object.  remote:  remote: Create a pull request for 'feature-akshay' on GitHub by visiting:  remote: https://github.com/ShelkeAkshay-2022mt93331/abc-repo/pull/new/feature-akshay  remote:  To https://github.com/ShelkeAkshay-2022mt93331/abc-repo.git  \* [new branch] feature-akshay -> feature-akshay  branch 'feature-akshay' set up to track 'origin/feature-akshay'. |

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| **GIT Commands Screenshot from local Git Bash** |
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| **Created Feature Branch in GitHub** |
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**vi) Add some raw code to the branch**

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| **GIT Commands from local Git Bash** |
| DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ ls  README.md Tow/ Tow\_2/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git branch feature-akshay  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git checkout feature-akshay  Switched to branch 'feature-akshay'  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ ls  README.md Tow/ Tow\_2/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ ls  README.md Tow/ Tow\_2/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ mkdir Tow\_3  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ touch Tow\_3/python\_code\_3.py  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ ls  README.md Tow/ Tow\_2/ Tow\_3/  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ git add Tow\_3  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ git commit -m "committing code file to feature branch"  [feature-akshay 6aed72e] committing code file to feature branch  1 file changed, 0 insertions(+), 0 deletions(-)  create mode 100644 Tow\_3/python\_code\_3.py  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ git push -u origin feature-akshay  Enumerating objects: 5, done.  Counting objects: 100% (5/5), done.  Delta compression using up to 8 threads  Compressing objects: 100% (2/2), done.  Writing objects: 100% (4/4), 371 bytes | 371.00 KiB/s, done.  Total 4 (delta 1), reused 0 (delta 0), pack-reused 0  remote: Resolving deltas: 100% (1/1), completed with 1 local object.  remote:  remote: Create a pull request for 'feature-akshay' on GitHub by visiting:  remote: https://github.com/ShelkeAkshay-2022mt93331/abc-repo/pull/new/feature-akshay  remote:  To https://github.com/ShelkeAkshay-2022mt93331/abc-repo.git  \* [new branch] feature-akshay -> feature-akshay  branch 'feature-akshay' set up to track 'origin/feature-akshay'. |

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| **GIT Commands Screenshot from local Git Bash** |
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| **Code files added to feature branch in GitHub** |
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**vii) Merge the Branch with Main line**

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| **GIT Commands from local Git Bash** |
| DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ git status  On branch feature-akshay  Your branch is up to date with 'origin/feature-akshay'.  nothing to commit, working tree clean  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (feature-akshay)  $ git checkout main  Switched to branch 'main'  Your branch is up to date with 'origin/main'.  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git merge feature-akshay  Updating 9a6908b..6aed72e  Fast-forward  Tow\_3/python\_code\_3.py | 0  1 file changed, 0 insertions(+), 0 deletions(-)  create mode 100644 Tow\_3/python\_code\_3.py  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git push -u origin main  Total 0 (delta 0), reused 0 (delta 0), pack-reused 0  To https://github.com/ShelkeAkshay-2022mt93331/abc-repo.git  9a6908b..6aed72e main -> main  branch 'main' set up to track 'origin/main'.  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ git status  On branch main  Your branch is up to date with 'origin/main'.  nothing to commit, working tree clean  DELL@DESKTOP-UH6PT1D MINGW64 /d/IntoductionToDevops-Assignement/abc-repo/my\_repository (main)  $ |

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| **GIT Commands Screenshot from local Git Bash** |
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| **Feature branch merged to master** |
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**Summary:**

**Advantages of moving from Centralized Source Code to Distributed Version Control**

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| **1.** | Distributed Version Control System has the biggest advantage in that it allows you to work offline and gives flexibility. You have the entire history of the code in your own hard drive, so all the changes you will be making in your own server or to your own repository which doesn’t require an internet connection, but this is not in the case of Centralized Source Code. |
| **2.** | Distributed Version Control System is faster than Centralized Source Code because you don’t need to communicate with the remote server for every command. You do everything locally which gives you the benefit to work faster than Centralized Source Code. |
| **3.** | Working on branches is easy in Distributed Version Control System. Every developer has an entire history of the code in Distributed Version Control System, so developers can share their changes before merging all the ‘sets of changes to the remote server. In Centralized Source Code it’s difficult and time-consuming to work on branches because it requires to communicate with the server directly. |
| **4.** | If the main server goes down or it crashes in Distributed Version Control System, you can still get the backup or entire history of the code from your local repository or server where the full revision of the code is already saved. This is not in the case of Centralized Source Code, there is just a single remote server that has entire code history. |
| **5.** | Merge conflicts with other developer’s code are less in Distributed Version Control System. Because every developer work on their own piece of code. Merge conflicts are more in Centralized Source Code in comparison to Distributed Version Control System. |
| **6.** | In Distributed Version Control System, sometimes developers take the advantage of having the entire history of the code and they may work for too long in isolation which is not a good thing. This is not in the case of Centralized Source Code. |

***THANK YOU !!***

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| ***GitHub Solution Repository*** | [**https://github.com/ShelkeAkshay-2022mt93331/abc-repo**](https://github.com/ShelkeAkshay-2022mt93331/abc-repo) |