

Topic	Git and making open source contributions		
Class Description	Students learn to practically use advanced features of git versioning tools - staging, branching, merging, comparing, resetting etc through writing a story. Students also learn to contribute to open source projects on github using git.		
Class	C67		
Class time	45 mins		
Goal	 Implement advanced git commands on our project git repository. Modify certain features of Monkey-Chunky App. Fork the Monkey Chunky Repository and make an open source contribution to the app. 		
Resources Required	 Teacher Resources Laptop with internet connectivity Earphones with mic Notebook and pen Android/iOS Smartphone with Expo App installed 		
	 Student Resources Laptop with internet connectivity Earphones with mic Notebook and pen Android/iOS Smartphone with Expo App installed 		
Class structure	Warm Up Teacher-led Activity Student-led Activity Wrap up	5 mins 15 min 15 min 5 min	

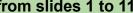
WARM-UP SESSION - 5 mins

CONTEXT

 Review the git commands students learned earlier and how they are used by developers to collaboratively work on a project.



Teacher starts slideshow



D

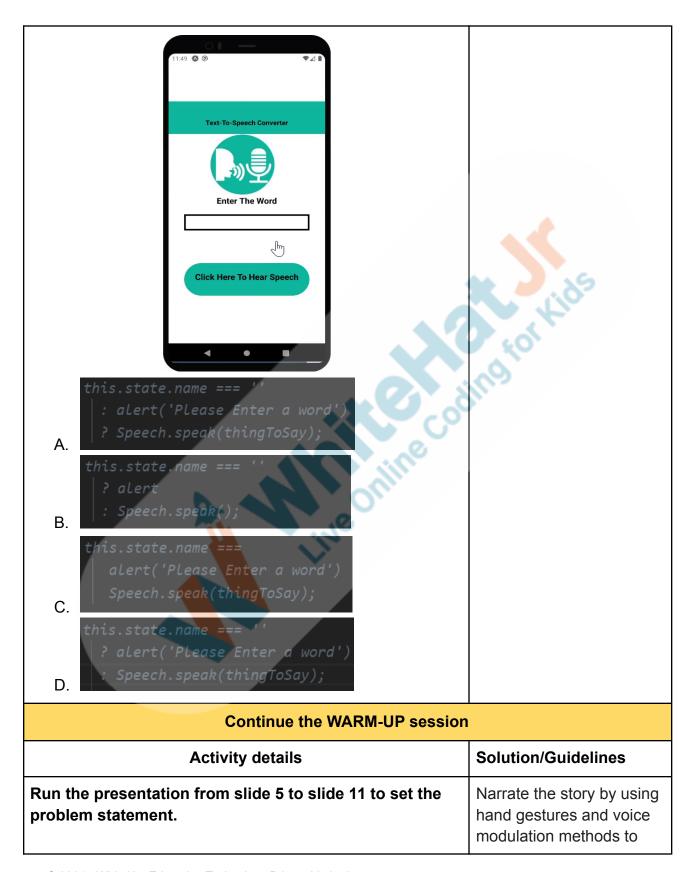
Refer to speaker notes and follow the instructions on each slide.		
Activity details	Solution/Guidelines	
Hey <student's name="">. How are you? It's great to see you! Are you excited to learn something new today?</student's>	ESR: Hi, thanks, Yes I am excited about it!	
Run the presentation from slide 1 to slide 4 Following are the WARM-UP session deliverables: • Greet the student. • Revision of previous class activities. • Quizzes	Click on the slide show tab and present the slides	
QnA Session		
Question	Answer	
Question	Aliswei	
Identify the correct option to import the Speech component.	A	
Identify the correct option to import the Speech component. A. A. A. A. A. A. A. A		
Identify the correct option to import the Speech component.		
Identify the correct option to import the Speech component. A. import * as Speech from 'expo-speech';		

From the following options select the correct option to

button is pressed.

display an alert box when textInput is kept empty and the





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Following are the WARM-UP session deliverables:

- Appreciate the student.
- Recall the learnings of React Native.

bring in more interest in students.

Teacher ends slideshow



TEACHER-LED ACTIVITY - 15 mins

Teacher Initiates Screen Share

CHALLENGE

Write a story using advanced git commands.

Step 2: Teacher-led Activity (15 min)

If you remember, git divides our work area into 3 stages:

- 1. **Working directory:** Where we are creating and making edits to our files.
- 2. **Staging area:** When the files are ready to be committed, we have to stage them first.
- 3. Local Glt Repository: After the files are committed, they become a part of commit history in a local repository.

You can compare this with Get, Set, Go! First we GET the files we have modified, then we SET them up in the staging area and then we commit (GO) in our local repository.

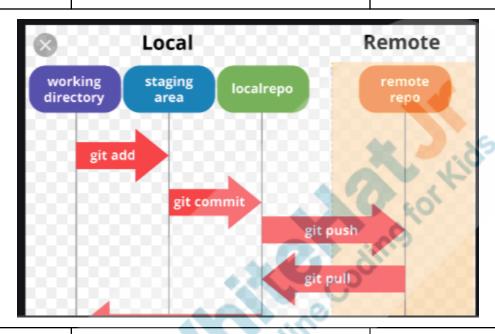
Then there is also a remote repository where we can push all our work so that anyone else (a team member / another developer) can access our work.

The student asks questions and get clarifications.



We are quickly going to see this through an example and then things will get even more clear.

Any questions so far?



Alright then.

Just like we code, let's try to write a story using git and see how git helps in keeping control of all the versions of our story (similar to different versions of code).

Open a terminal (git bash). Let's make a new directory called "MyStory" using 'mkdir' command and change into the directory (using cd command).

The student observes.

```
File Edit View Search Terminal Help
Welcome to fish, the friendly interactive shell
rajeev@atlantis -> mkdir myStory
rajeev@atlantis -> cd myStory/
rajeev@atlantis -/myStory> []
```

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Let's navigate to the said folder and create two empty files called "Characters" and "Story".

You can open these files in any editor and start writing.

*Note: You can be interactive with the student and create a new story with different characters based on student inputs.

Let's initialize git using 'git init' so that git can start tracking changes in our files.

The student gives inputs on the story and the characters.

Characters File:



Story File:

```
**Storp**
Once upon a time, in a forest, there lived a monkey who resided on a jamoon (berry) tree, which was on the banks of a river. In the same forest, there lived a crocodile and his wife......
```

Git Init:

```
rajeev@atlantis ~/myStory> git init
Initialized empty Git repository in /home/rajeev/myStory/.git/
rajeev@atlantis -/myStory> []
```



The changes we are making in the files are in the working directory. We can make as many changes as we want here.

If we want to commit these changes to the history in our local repo, we need to stage these changes. We can simply type git status to check the status of our git working directory.

You can see that there are two files which need to be added to the staging area.

We can do that using git add [filename1] [filename2]

The student learns how to use git add to add files to the staging area.

```
rajeev@atlantis ~/myStory> git status
On branch master
No commits yet

Untracked files:
    (use "git add <file>..." to include in what will be committed)

Characters
Story

nothing added to commit but untracked files present (use "git add" to track)
rajeev@atlantis -/myStory> git add Characters Story
rajeev@atlantis -/myStory>
```

We can continue to make more changes in the file.

For every change in a file, we will have to change the stages again. Otherwise git will have the snapshot of the older staged file in its memory.

At one point of time, we will want to commit the changes to our local repository's history.

The student learns how to use git add to add files to the staging area.



We can do that using **git commit-m "a message"**

Teacher shows how to commit a message.

```
File Edit View Search Terminal Help

rajeev@atlantis ~/ryStory> git commit ·m "Add characters and setting for the story"

[master (root-commit) e37fd69] Add characters and setting for the story

2 files changed, 6 insertions(+)

create mode 100644 Characters

create mode 100644 Story

rajeev@atlantis ~/ryStory>
```

Let's make a few more changes in our story and stage the changes again.

Can you help me do that?

The student helps the teacher in adding to the story and then staging the change again.

```
File Edit View Search Terminal Help

**Story**
Once upon a time, in a forest, there lived a monkey who resided on a jamoon (berry) tree, which was on the banks of a river. In the same fores
t, there lived a crocodile and his wife. One day, the crocodile came to the banks of the river and rested under the tree. The kindhearted monk
ey offered him some fruits. The crocodile came back the next day for more fruits, as he loved them. As days passed by, the crocodile and the m
onkey became good friends.
```



There is a beautiful command using which you can see the difference between the two files since the last commit and the current staged file.

Student observes and asks questions

You can do this using 'git diff --staged'. This will show you the difference between the last committed file and the currently staged file.

Teacher writes the command to show how git diff works.

```
File Edit View Search Terminal Help

rajeev@atlantis -/my5tory> git diff --staged
diff --git a/story b/story
index caadbes..65faac7 100644

--- a/story
+++ b/story
98 -1,2 +1,2 @8

**Story**
-Once upon a time, in a forest, there lived a monkey who resided on a jamoon (berry) tree, which was on the banks of a river. In the same fore
st, there lived a croccodite and his wife....
*Once upon a time, in a forest, there lived a monkey who resided on a jamoon (berry) tree, which was on the banks of a river. In the same fore
st, there lived a croccodite and his wife. One day, the croccodite came to the banks of the river and rested under the tree. The kindhearted mon
key offered him some fruits. The croccodite came back the next day for more fruits, as he loved them. As days passed by, the croccodite and the
monkey became good friends.
rajeev@atlantis -/my5tory>
```

You can also make more changes in the working directory and see the difference between your working directory and the currently staged file.

We do that using "git diff"
git diff is very helpful if a developer is
looking at changes made by someone
else in their code since they last worked
on it.

Teacher shows how to do this.

The student learns how to use git diff.



diff --git a/Story b/Story index 65faac7..9883c62 100644 --- a/Story +++ b/Story y pon a time, in a forest, there lived a monkey who resided on a jamoon (berry) tree, which was on the banks of a river. In the same fore re lived a crocodile and his wife. One day, the crocodile came to the banks of the river and rested under the tree. The kindhearted mon 'ered him some fruits. The crocodile came back the next day for more fruits, as he loved them. As days passed by, the crocodile and the became good friends. We can commit the file to the local repo The student guides the teacher on how to commit again with a commit message. to the local repo. Can you help me? How do I do this? rajeev@atlantis ~/mys tory> git commit -m "Add the story plot [master 776cdee] Add the story plot 1 file changed, 1 insertion(+), 1 deletion(-)
rajeev@atlantis -/myStory> Let's say you don't like the current story plot which you have written and want to ESR: move back to the older commit. This should be possible right? Yes! You can see all your commits using the git log command. You can also see the time of the commit, the author and the commit message. There is also a commit id given to each commit. You can use the id or even the first 5 characters of the id to move back to that commit using git checkout <commit id> Teacher shows how to use the git checkout.



```
le2d977a8c (HEAD -> master)
Author: whitehatjr <rajeev@whitehatjr.com>
Date: Wed Jan 15 12:55:55 2020 +0530
     Add conflict
Author: whitehatjr <rajeev@whitehatjr.com>
Date: Wed Jan 15 12:51:45 2020 +0530
     Add the story plot
commit e37fdc9ddd872c8fa37a6034bdb2b83f2b738ab8
Author: whitehatjr <rapev@whitehatjr.com>
          Wed Jan 15 12:20:54 2020 +0530
     Add characters and setting for the story
rajeev@atlantis -/myStory> git checkout e37
Note: checking out 'e37fd
You are in 'detached HEAD' state. You can look around, make experimental
changes and commit them, and you can discard any commits you make in this state without impacting any branches by performing another checkout.
If you want to create a new branch to retain commits you create, you may do so (now or later) by using -b with the checkout command again. Example
  git checkout -b <new-branch-name>
HEAD is now at e37fd69 Add characters and setting for the story
rajeev@atlantis ~/myStory>
```

You can open the Story file and see that it contains the text you had written in your first commit!

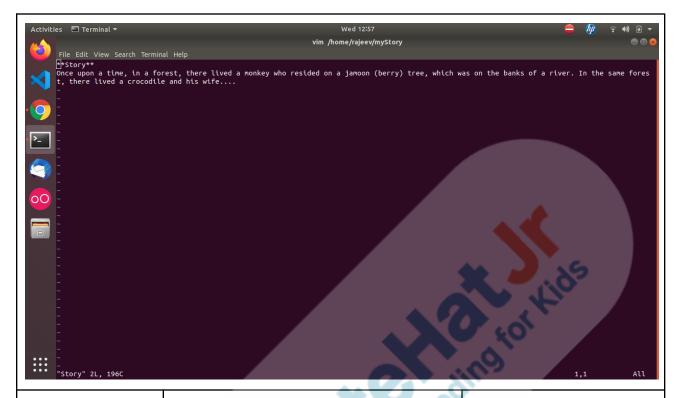
Isn't that amazing!

This way you can move around to any commit history you have made.

If you are properly committing your work for every story line (or every feature while writing code), you can fearlessly experiment with your work without having the fear of losing your work!!

The student asks any questions he/she has on their minds.





Now, there is a possibility that you might want to explore another plot in your story or add new characters.

You can do this by creating a new branch here. Your current branch was called 'master' by default.

We all know this story where the monkey is the hero and crocodile's wife is the villain. Let's flip the story in our new branch. Let's make the crocodile's wife a hero and monkey the villain.

You can also see all the branches in your local repo using the **'git branch'** command.

Your current branch will be shown with *

The student understands about git branching and git checkout to a new branch.

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.

After creating the branch, you will also have to checkout to that branch using git checkout command. This will move you to the FlippedStory branch.

Let's write our flipped story here, stage the file and write a new commit.

Flipped Story:

```
File Edit View Search Terminal Help

**Story**

Once upon a time, in a forest, there lived a monkey who resided on a jamoon (berry) tree, which was on the banks of a river. In the same fores t, there lived a crocodile and his wife.

The monkey wanted to make a cloth for himself using crocodile skin. He slowly started trying to befriend the crocodile by feeding him the berr tes. The berries were delicious and the crocodile liked it. After sometime, the monkey started poisoning the berries.....
```

Creating Git branch:

```
rajeev@atlantis -/myStory> git branch "FlippedStory"
rajeev@atlantis -/myStory> git branch
* (HEAD detached at e37fd09)
FlippedStory
master
rajeev@atlantis -/myStory> vin Story
rajeev@atlantis -/myStory> git checkout FlippedStory
M Story
Switched to branch 'FlippedStory'
rajeev@atlantis -/myStory> ]
```

If you currently press **git log**, it will show your the commits log for only the current branch.

Teacher does ggit lo and shows the output.



```
rajeev@atlantis -/myStory> git log
commit b74fdic4bc40b760366d97bd838a591580169631 (HEAD -> FlippedStory)
Author: whitehatjr <rajeev@whitehatjr.com>
Date: Wed Jan 15 13:18:25 2020 +0530

Add flipped plot where monkey is the villain

commit e37fd69ddd872c8fa37a6034bdb2b83f2b738ab8
Author: whitehatjr <rajeev@whitehatjr.com>
Date: Wed Jan 15 12:20:54 2020 +0530

Add characters and setting for the story
```

At any point of time, you can abandon this branch and move to the master branch using 'git checkout master'. It will take you to the last commit you had made in the master branch.

Teacher shows how to checkout to a master branch.

Later you can switch to FlippedBranch anytime and continue writing the story wherever you have left.

Think how this would be useful when we are coding?

The student thinks about the use of branching in writing code.

- When we are working on a new feature in our code.
- When we are re-thinking the idea of what our app does and want to test different features etc.

```
rajeev@atlantis =/myStory> git log
commit edd0d5ea2f094a18ac914e90f5dae21e2d977a8c (HEAD -> master)
Author: whitehatjr <rajeev@whitehatjr.com>
Date: Wed Jan 15 12:55:55 2020 +0530

Add conflict

commit 776cdeeb971b0c1950d5547aec43a179ce725202
Author: whitehatjr <rajeev@whitehatjr.com>
Date: Wed Jan 15 12:51:45 2020 +0530

Add the story plot

commit e37fd69ddd872c8fa37a6034bdb2b83f2b738ab8
Author: whitehatjr <rajeev@whitehatjr.com>
Date: Wed Jan 15 12:20:54 2020 +0530

Add characters and setting for the story
rajeev@atlantis =/myStory>
```



You can check the difference between the lines in the HEAD of the two branches using

git diff branchA branchB

HEAD here refers to the latest commit of the two branches.

Teacher shows how git diff works with branches.

Sometimes two branches can work towards the same feature and then later they can be merged using **git merge** command. But here the files are too different. We can explore git merge sometime later.



Now, let's upload all our commits to a remote repository (also called upstream repository).

We will first need to create an empty Github repository.

You already know how to do that and you can guide me.

The student guides the teacher to create a new empty git repository.







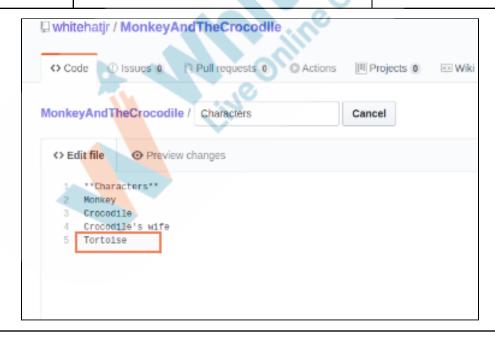
Now, what if some other developer made some changes in the remote repo?

Your local repo will be out of sync then.

Let's try to do this. Let's manually change something on the remote repo.

Teacher changes a file on the remote repo and makes a commit.

The student observes.





Commit changes		
Add a new character - tortoise		
Add an optional extended description		
Commit directly to the master branch.		
 \(\text{\text{T}}\) Create a new branch for this commit and s 	start a pull request, Learn more about pull requests.	

Now, we will not be able to make any new pushes to the remote repo since our local repo is out of sync. We can use **git pull** to update our repo with the upstream repo.

Teacher shows how to use git pull [remoteName] [currentBranchName].

*Note: If there are too many conflicts in the current working directory vs the remote repo, you will be asked to make a new commit. Make a new commit and then apply the git push.

Now you can open the working directory to see that the current repo is updated with the new name of the character.

The teacher can open the characters page and show the student that the character names have been updated.

The student observes and asks questions.

```
rajeev@atlantis -/myStory> git pull origin master
From https://github.com/whitehatjr/MonkeyAndTheCrocodile
* branch master -> FETCH_HEAD
Merge made by the 'recursive' strategy.
Characters | 1 +
1 file changed, 1 insertion(+)
rajeev@atlantis -/myStory> []
```



Perge branch 'master' of https://github.com/whitehatjr/MonkeyAndTheCrocodile

Please enter a commit message to explain why this merge is necessary,

especially if it merges an updated upstream into a topic branch.

Lines starting with '#' will be ignored, and an empty message aborts

the commit.

This is a lot to learn about git in a single day.

As you practice using git more, you will become more comfortable with how git works.

We also have a great visual tutorial for most of the git commands which is very helpful for visualizing how git commands work.

Why don't you try this?

Teacher Stops Screen Share

STUDENT-LED ACTIVITY - 25 mins

- Ask Student to press ESC key to come back to panel
- Guide Student to start Screen Share
- Teacher gets into Fullscreen

ACTIVITY

 Fork the Monkey Chunky Repository and make an open source contribution to the project.

Teacher starts slideshow =



Refer to speaker notes and follow the instructions on each slide.

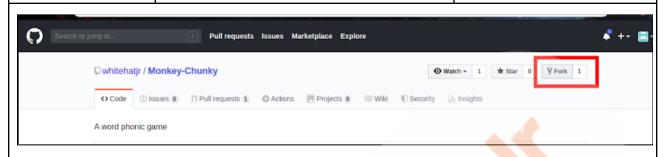
Now it's your turn. Please share your screen with me.



	Teacher ends slideshow	
Step 3: Student-Led Activity (15 min)	Teacher helps the student go through the instruction and tutorials for Student Activity1	The student spends some time going through each of the git commands, practicing and visualizing the commits. The student asks questions where needed.
	Awesome! Did this exercise help in bringing more clarity and understanding about Monkey Chunky App?	ESR: Yes!
	Alright. Now that we know how to use git, we are going to learn how to make contributions to open source projects. Look at Student Activity 2. It is the Monkey Chunky App which is released as an open source project.	Student looks at Student Activity 2
	This repository contains all the commits made while the developer worked on the Monkey Chunky App. To make a contribution to the app, we must first fork the project. Forking creates a duplicate of the repository in your own account where you can work and modify the contents of the project. Teacher guides the student to fork the project.	The student forks the project.



*Note: Forking the project can take a little time.



This is the forked repository. You can clone this repository into your system.

The student uses git clone to clone the repository into his/her system.

```
abhijeet@oasis:~$
abhijeet@oasis:~$ git clone https://github.com/Abhijeetholkar97/Monkey-Chunky-1
Cloning into 'Monkey-Chunky-1'...
remote: Enumerating objects: 37, done.
remote: Counting objects: 100% (37/37), done.
remote: Compressing objects: 100% (21/21), done.
remote: Total 37 (delta 15), reused 37 (delta 15), pack-reused 0
Unpacking objects: 100% (37/37), done.
abhijeet@oasis:~$
```

Now cd into your forked repo. Let's make some changes into this project. Some example changes you can make are:

- 1. You can make the input box rounded.
- 2. You can make the phonic chunk buttons in a horizontal row instead of column by changing the flex-direction.

The student makes edits to the file to make these changes.





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Finally, you can stage and commit these changes.

The student stages the files and commits the changes with a commit message.

```
no changes added to commit (use "git add" and/or "git commit -a")

!~/Monkey-Chunky-1$ git add .

!~/Monkey-Chunky-1$ git commit -m "Round corners of input box"

[master 6bebicd] Round corners of input box

1 file changed, 1 insertion(+)

!~/Monkey-Chunky-1$ git status

On branch master

Your branch is ahead of 'origin/master' by 1 commit.

(use "git push" to publish your local commits)

Changes not staged for commit:

(use "git add <file>..." to update what will be committed)

(use "git checkout -- <file>..." to discard changes in working directory)

modified: App.js

no changes added to commit (use "git add" and/or "git commit -a")

*/Monkey-Chunky-1$ git add" and/or "Flex direction row for chunk buttons"

[master 8ddSfac] Flex direction row for chunk buttons

1 file changed, 1 insertion(+), 1 deletion(-)

!~/Monkey-Chunky-1$ []
```

Push the new commits to your forked repo.

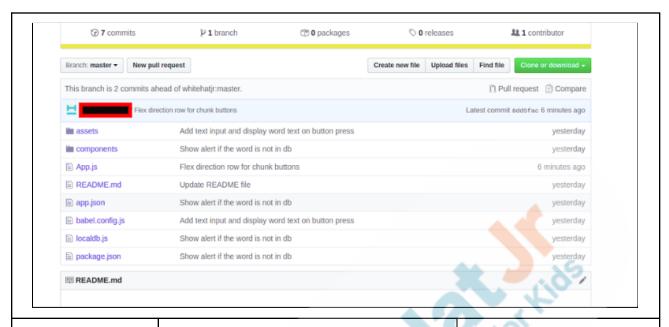
The student cd into the forked local repo and pushes the commits to the remote repo.

```
"~/Monkey-Chunky-1$ git push
Username for 'https://github.com':
Password for 'https://
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 4 threads
Compressing objects: 100% (6/6), done.
Writing objects: 100% (6/6), 670 bytes | 670.00 KiB/s, done.
Total 6 (delta 4), reused 0 (delta 0)
remote: Resolving deltas: 100% (4/4), completed with 2 local objects.
To https://github.com/Abhijeetholkar97/Monkey-Chunky-1
1e83a07..8dd5fac master -> master
```

Awesome. let's see if the new commits are added in the remote forked repo.

The student sees the new commits added to the remote forked repo.





Now your forked repo is different from the original repo.

You can make a pull request on the original repo. This will send a request to the original developer of the project to pull the changes you have made into their current project.

You will have to write a message to tell the developer what change you made. The developer can accept the pull request and merge the changes into their current project.

The pull request will remain open till it is merged with the original project or closed by the developer. Once merged, you will then be added as a contributor to the project.

Guide the student to make a pull request.

The student makes a pull request.





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Teacher starts slideshow from slide 14 to slide 25		
Activity details	Solution/Guidelines	
Run the presentation from slide 14 to slide 25 Following are the WRAP-UP session deliverables: Following are the wrap-up session deliverables: Explain the facts and trivias Next class challenge Project for the day Additional Activity	Discuss with the student the current class activities and Student will ask doubts related to the activities.	
Quiz time - Click on in-class quiz		
Question	Answer	
Which git command is used to initialize the repository? A. git init B. git add C. git commit D. git push	A	
When it comes to the git stages what is a working directory? A. it is the stage where the files are ready to be	В	
committed, we have to stage them first B. it is the stage where we are creating and making edits to our files C. it is the stage after the files are committed, they become a part of commit history in a local repository D. it is the stage where the local repository is created		
Which of the following commands is used to see all your commits and also see the time of the commit, the author and the commit message?	D	



- A. git commit
- B. git checkout
- C. git push
- D. git log

End the quiz panel

FEEDBACK

Get students to explore different open source projects in React Native.		
	You get a "hats off".	Make sure you have given at least 2 Hats Off during
	Till next class then. See you. Bye!	the class for: Creatively Solved Activities
		Great Question
	A A Onlin	Strong Concentration
	In the next class, we will be starting on a new project and a new problem statement.	
Project Pointers and Cues (5 min)	CONTRIBUTE TO TEAM	Note: You can assign the project to the student in
	VOTING APP	class itself by clicking on the Assign Project button which is available under
	Goal of the Project:	the projects tab.
	In Class 67 you learned about advanced features of git versioning tools - staging, branching, merging, comparing, resetting and how to contribute to open source projects on github using git.	

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In this project you have to contribute to a project app called "Team Voting App" using advanced git commands. Story: Every Saturday, your teacher organizes a fun game activity in which she divides students into two teams in your class. When it comes to voting for the winning teams, it becomes very complex for the teacher to count votes. Your teacher knows that you are learning how to code. She has asked you to create a Team Voting App and help her in resolving her issue. You need to explore the existing Team Voting app and make meaningful contributions to the functioning of this app. Are you ready? I am very excited to see your project solution and I know you both will do really well. Bye Bye! **Teacher ends slideshow x** End Class **Teacher Clicks** Additional Encourage the student to write The student uses the Activities reflection notes in their reflection journal markdown editor to write using markdown.

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Use these as guiding questions: • What happened today? • Describe what happened • Code I wrote • How did I feel after the class?	her/his reflection as a reflection journal.
 What have I learned about programming and developing games? What aspects of the class helped me? What did I find difficult? 	

Activity	Activity Name	Links
Student Activity 1	Visual Git Tutorial	https://onlywei.github.io/explain-git-with-d3/
Student Activity 2	Monkey Chunky Open Repo	https://github.com/whitehatjr/Monkey -Chunky
Project Solution Link	CONTRIBUTE TO TEAM VOTING APP	Solution depends on students' submission.
Teacher Reference visual aid link	Visual aid link	https://curriculum.whitehatjr.com/Vis ual+Project+Asset/PRO_VD/BJFC_ PRO_V3_C67_withcues.html
Teacher Reference In-class quiz	In-class quiz	https://s3-whjr-curriculum-uploads.w hjr.online/54182c5b-ed48-4a71-918 2-125c9885422c.pdf