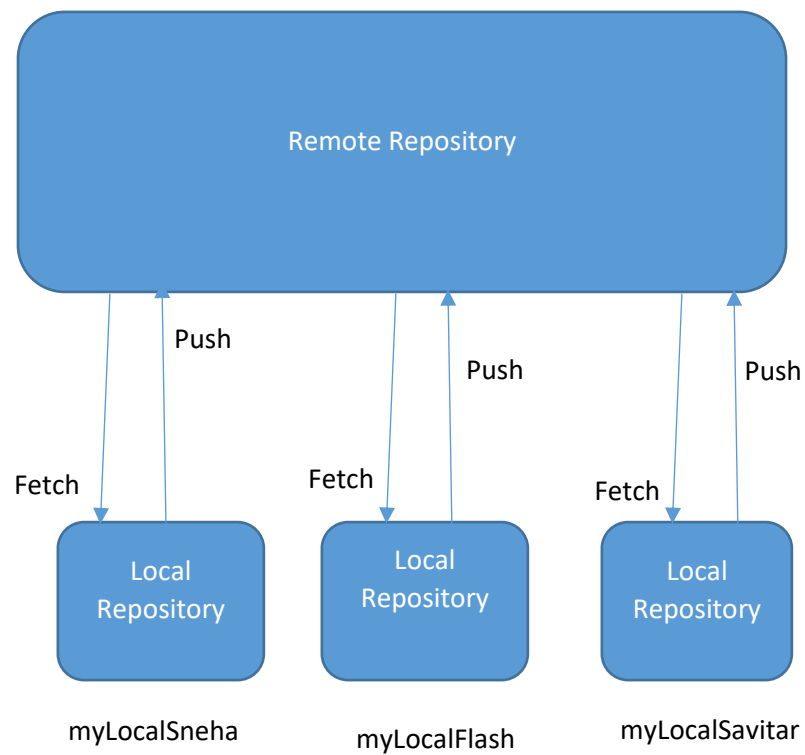# Software Method & Tools

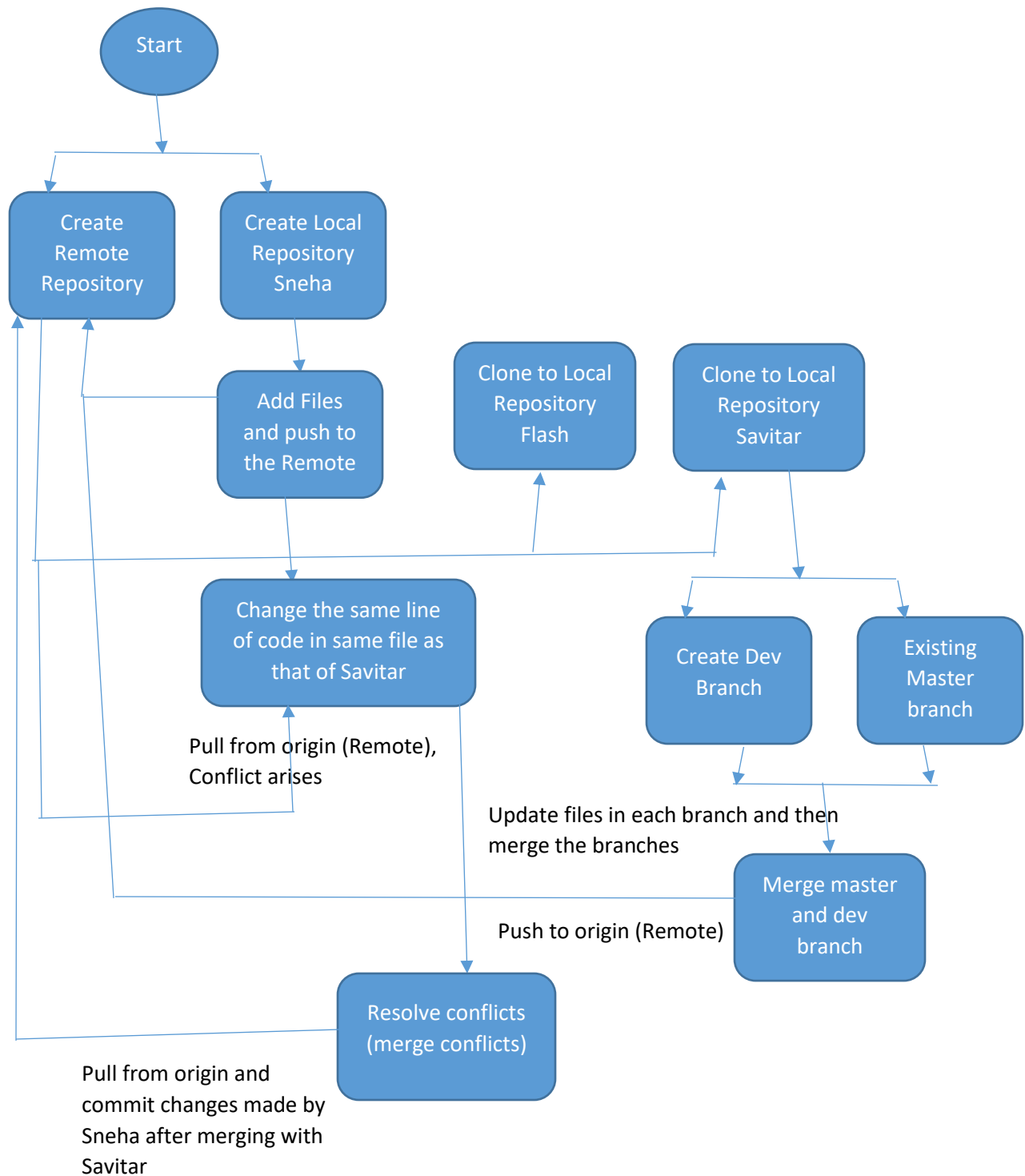## Assignment 8

By

Sneha Mishra

Collaboration Pattern used for this Assignment is:

Remote Repository is created using name – myGitRemot.git.

3 Local repositories are created with names – myLocalSneha, myLocalFlash, myLocalSavitar.

Remote Repository

Push

Push

Push

Fetch

Fetch

Fetch

Local Repository

Local Repository

Local Repository

myLocalSneha

myLocalFlash

myLocalSavitar

The working flow is:

Start

Create Remote Repository

Create Local Repository Sneha

Add Files and push to the Remote

Clone to Local Repository Flash

Clone to Local Repository Savitar

Change the same line of code in same file as that of Savitar

Create Dev Branch

Existing Master branch

Pull from origin (Remote), Conflict arises

Update files in each branch and then merge the branches

Push to origin (Remote)

Merge master and dev branch

Resolve conflicts (merge conflicts)

Pull from origin and commit changes made by Sneha after merging with Savitar

GIT Concepts/Operation:

1. Creating a remote branch:

```
smccr@KC-SCE460LAB-28 MINGW64 /q/Desktop
$ mkdir myGitRemote.git

smccr@KC-SCE460LAB-28 MINGW64 /q/Desktop
$ cd myGitRemote.git/

smccr@KC-SCE460LAB-28 MINGW64 /q/Desktop/myGitRemote.git
$ git init --bare
Initialized empty Git repository in Q:/Desktop/myGitRemote.git/

smccr@KC-SCE460LAB-28 MINGW64 /q/Desktop/myGitRemote.git (BARE:master)
$ ls
total 13K
-rw-r--r-- 1 smccr 1049089 104 May  7 15:42 config
-rw-r--r-- 1 smccr 1049089  73 May  7 15:42 description
-rw-r--r-- 1 smccr 1049089  23 May  7 15:42 HEAD
drwxr-xr-x 1 smccr 1049089   0 May  7 15:42 hooks
drwxr-xr-x 1 smccr 1049089   0 May  7 15:42 info
drwxr-xr-x 1 smccr 1049089   0 May  7 15:42 objects
drwxr-xr-x 1 smccr 1049089   0 May  7 15:42 refs

smccr@KC-SCE460LAB-28 MINGW64 /q/Desktop/myGitRemote.git (BARE:master)
$
```

2. Creating a first local branch (Sneha):

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop
$ mkdir myLocalSneha

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop
$ cd myLocalSneha/

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha
$ git init
Initialized empty Git repository in Q:/Desktop/myLocalSneha/.git/

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (master)
$ git add *
warning: LF will be replaced by CRLF in BoardPanel.java.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in Clock.java.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in SidePanel.java.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in Tetris.java.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in TileType.java.
The file will have its original line endings in your working directory.

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (master)
$ git commit -m "Initial Import"
[master (root-commit) 9589356] Initial Import
 Committer: Sneha Mishra <smccr@umkc.edu>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:

    git config --global user.name "Your Name"
    git config --global user.email you@example.com

After doing this, you may fix the identity used for this commit with:

    git commit --amend --reset-author

 5 files changed, 1796 insertions(+)
 create mode 100644 BoardPanel.java
 create mode 100644 Clock.java
 create mode 100644 SidePanel.java
 create mode 100644 Tetris.java
 create mode 100644 TileType.java

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (master)
$ git remote add origin /q/Desktop/myRemoteGit.git/

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (master)
$ git push origin master
Counting objects: 7, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (7/7), done.
Writing objects: 100% (7/7), 12.95 KiB | 0 bytes/s, done.
Total 7 (delta 0), reused 0 (delta 0)
To Q:/Desktop/myRemoteGit.git/
 * [new branch]      master -> master
```

Creating second local branch (Flash) by cloning remote repositories

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop
$ git clone file:///q/Desktop//myRemoteGit.git myLocalFlash
Cloning into 'myLocalFlash'...
remote: Counting objects: 7, done.
remote: Compressing objects: 100% (7/7), done.
remote: Total 7 (delta 0), reused 0 (delta 0)
Receiving objects: 100% (7/7), 12.95 KiB | 0 bytes/s, done.

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop
```

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$ ls
total 56K
-rw-r--r-- 1 smccr 1049089  13K May 10 10:16 BoardPanel.java
-rw-r--r-- 1 smccr 1049089 3.9K May 10 10:16 Clock.java
-rw-r--r-- 1 smccr 1049089 6.5K May 10 10:16 SidePanel.java
-rw-r--r-- 1 smccr 1049089  15K May 10 10:16 Tetris.java
-rw-r--r-- 1 smccr 1049089 9.0K May 10 10:16 TileType.java
```

Creating third local branch (Savitar) by cloning remote repositories

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop
$ git clone file:///q/Desktop//myRemoteGit.git myLocalSavitar
Cloning into 'myLocalSavitar'...
remote: Counting objects: 7, done.
remote: Compressing objects: 100% (7/7), done.
remote: Total 7 (delta 0), reused 0 (delta 0)
Receiving objects: 100% (7/7), 12.95 KiB | 0 bytes/s, done.

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop
```

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop
$ cd myLocalSavitar/

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master)
$ ls
total 56K
-rw-r--r-- 1 smccr 1049089  13K May 10 10:21 BoardPanel.java
-rw-r--r-- 1 smccr 1049089 3.9K May 10 10:21 Clock.java
-rw-r--r-- 1 smccr 1049089 6.5K May 10 10:21 SidePanel.java
-rw-r--r-- 1 smccr 1049089  15K May 10 10:21 Tetris.java
-rw-r--r-- 1 smccr 1049089 9.0K May 10 10:21 TileType.java

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master)
$
```
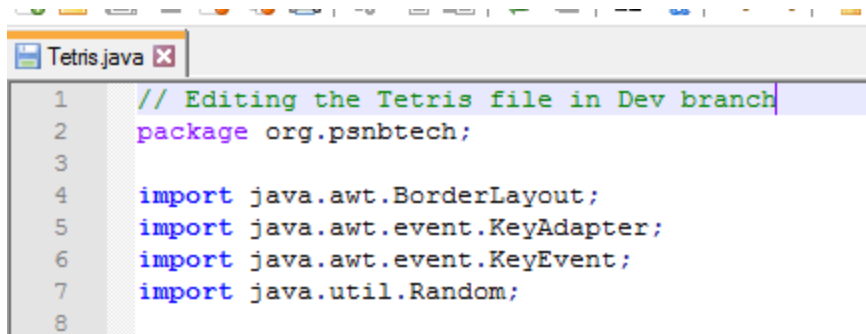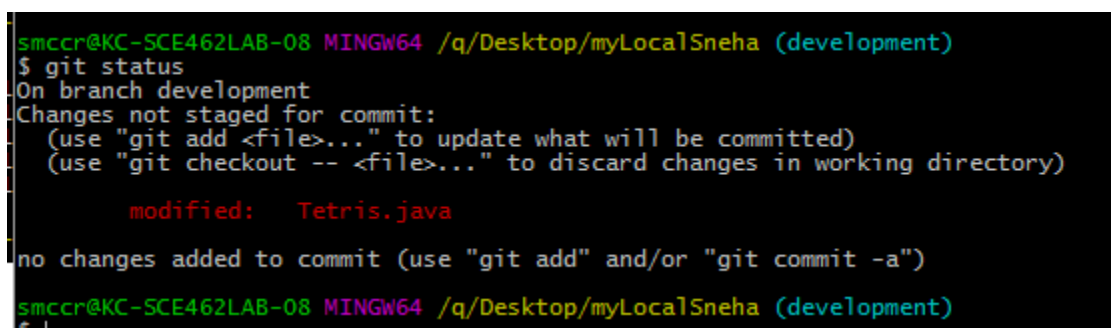
3. Branching - Creating branch of repo Sneha called Development

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (master)
$ git checkout -b development
Switched to a new branch 'development'

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (development)
$
```

```
     Tetris.java ☒
     1       // Editing the Tetris file in Dev branch
     2       package org.psnbtech;
     3
     4       import java.awt.BorderLayout;
     5       import java.awt.event.KeyAdapter;
     6       import java.awt.event.KeyEvent;
     7       import java.util.Random;
     8
```
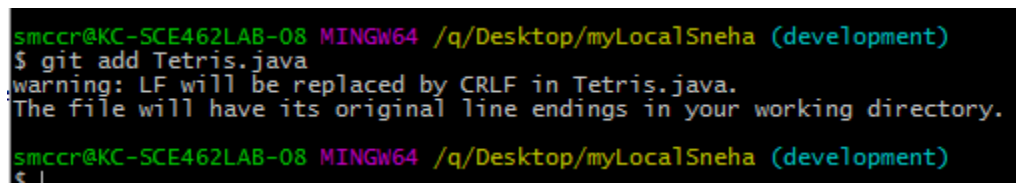
```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (development)
$ git status
On branch development
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   Tetris.java

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

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (development)
$
```
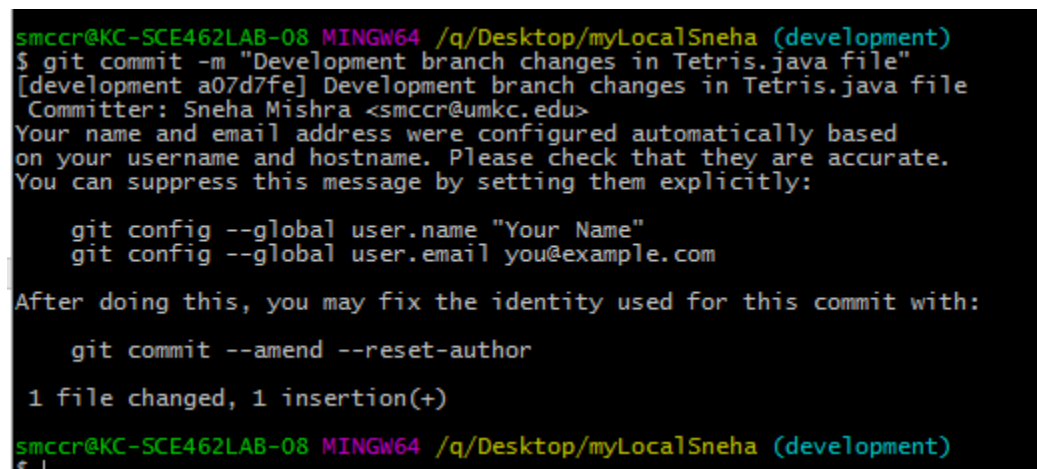
4. Staging the changes made by Sneha

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (development)
$ git add Tetris.java
warning: LF will be replaced by CRLF in Tetris.java.
The file will have its original line endings in your working directory.

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (development)
$
```

5. Committing changes made by Sneha

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (development)
$ git commit -m "Development branch changes in Tetris.java file"
[development a07d7fe] Development branch changes in Tetris.java file
 Committer: Sneha Mishra <smccr@umkc.edu>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:

    git config --global user.name "Your Name"
    git config --global user.email you@example.com

After doing this, you may fix the identity used for this commit with:

    git commit --amend --reset-author

 1 file changed, 1 insertion(+)

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (development)
$
```

6. Merging dev to master branch in Sneha repository

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (development)
$ git checkout master
Switched to branch 'master'

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (master)
$ git merge development
Updating 9589356..a07d7fe
Fast-forward
 Tetris.java | 1 +
 1 file changed, 1 insertion(+)

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (master)
```

7. Checking remote (origin) status

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (development)
$ git remote show origin
* remote origin
  Fetch URL: Q:/Desktop/myRemoteGit.git/
  Push  URL: Q:/Desktop/myRemoteGit.git/
  HEAD branch: master
  Remote branches:
    development tracked
    master      tracked
  Local refs configured for 'git push':
    development pushes to development (up to date)
    master      pushes to master     (up to date)

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (development)
```

8. Move to next local repo Flash and check the status

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSneha (development)
$ cd ..

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop
$ cd myLocalFlash/

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$ git remote show origin
* remote origin
  Fetch URL: file:///q/Desktop//myRemoteGit.git
  Push  URL: file:///q/Desktop//myRemoteGit.git
  HEAD branch: master
  Remote branches:
    development new (next fetch will store in remotes/origin)
    master      tracked
  Local branch configured for 'git pull':
    master merges with remote master
  Local ref configured for 'git push':
    master pushes to master (up to date)

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$
```

9. Fetching the origin

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$ git fetch origin
remote: Counting objects: 3, done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 3 (delta 2), reused 0 (delta 0)
Unpacking objects: 100% (3/3), done.
From file:///q/Desktop//myRemoteGit
 * [new branch]      development -> origin/development

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$
```

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$ git remote show origin
* remote origin
  Fetch URL: file:///q/Desktop//myRemoteGit.git
  Push  URL: file:///q/Desktop//myRemoteGit.git
  HEAD branch: master
  Remote branches:
    development tracked
    master      tracked
  Local branch configured for 'git pull':
    master merges with remote master
  Local ref configured for 'git push':
    master pushes to master (up to date)

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$
```
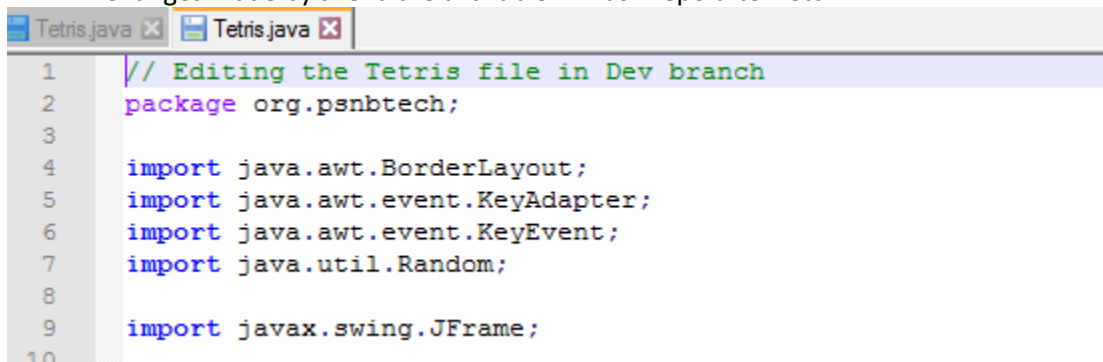
10. Tracking branch from the remote branch origin/development

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$ git checkout -b devlopment origin/development
Branch devlopment set up to track remote branch development from origin.
Switched to a new branch 'devlopment'

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (devlopment)
$
```

11. Changes made by sneha are available in Flash repo after fetch

```
Tetris.java    Tetris.java

1   // Editing the Tetris file in Dev branch
2   package org.psnbtech;
3
4   import java.awt.BorderLayout;
5   import java.awt.event.KeyAdapter;
6   import java.awt.event.KeyEvent;
7   import java.util.Random;
8
9   import javax.swing.JFrame;
10
```

12. **Creating conflicts**
     12.1 Changes made in Dev repo by Flash

```
BoardPanel.java ☒
1      //changes made by Flash uin dev branch
2      package org.psnbtech;
3
4      import java.awt.Color;
5      import java.awt.Dimension;
6      import java.awt.Font;
7      import java.awt.Graphics;
```

12.2 Git status

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (development)
$ git status
On branch development
Your branch is up-to-date with 'origin/development'.
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:   BoardPanel.java

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

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (development)
```

12.3   Committing changes made by Flash

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (development)
$ git add BoardPanel.java

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (development)
$ git commit -m "Devlopment by Flash in Dev branch"
[development fafca57] Devlopment by Flash in Dev branch
 Committer: Sneha Mishra <smccr@umkc.edu>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:

    git config --global user.name "Your Name"
    git config --global user.email you@example.com

After doing this, you may fix the identity used for this commit with:

    git commit --amend --reset-author

 1 file changed, 1 insertion(+)

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (development)
$ git push origin development
Counting objects: 3, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 342 bytes | 0 bytes/s, done.
Total 3 (delta 2), reused 0 (delta 0)
To file:///q/Desktop//myRemoteGit.git
   a07d7fe..fafca57  development -> development

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (development)
```
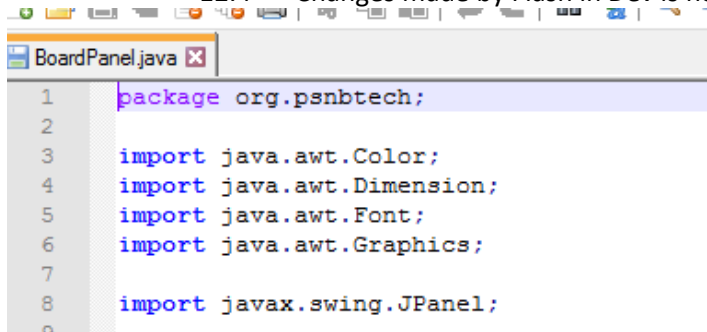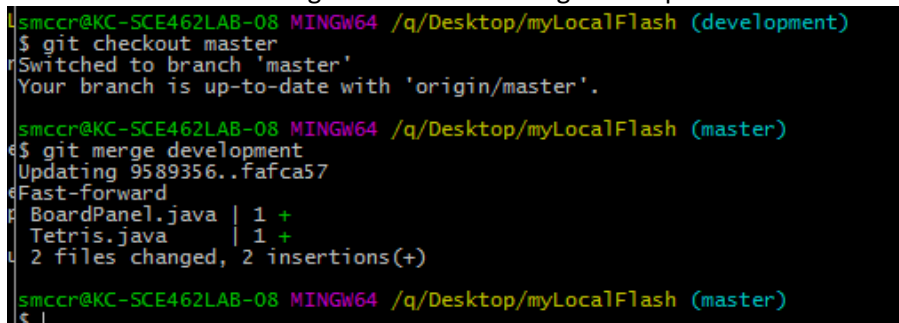
12.4 Changes made by Flash in Dev is not available in Master branch

```
BoardPanel.java ☒
1    package org.psnbtech;
2
3    import java.awt.Color;
4    import java.awt.Dimension;
5    import java.awt.Font;
6    import java.awt.Graphics;
7
8    import javax.swing.JPanel;
```

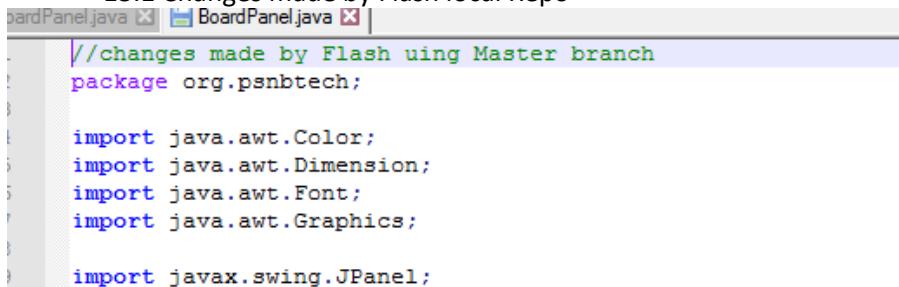## 12.5 Merged the file and changes are updated

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (development)
$ git checkout master
Switched to branch 'master'
Your branch is up-to-date with 'origin/master'.

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$ git merge development
Updating 9589356..fafca57
Fast-forward
 BoardPanel.java | 1 +
 Tetris.java     | 1 +
 2 files changed, 2 insertions(+)

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$
```

13. Conflict resolving

13.1 Changes made by Flash local Repo

```
BoardPanel.java ☒   BoardPanel.java ☒
    //changes made by Flash uing Master branch
    package org.psnbtech;

    import java.awt.Color;
    import java.awt.Dimension;
    import java.awt.Font;
    import java.awt.Graphics;

    import javax.swing.JPanel;
```

13.2 Pushing the Flash changes to the remote

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$ git add BoardPanel.java

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$ git commit -m "changes by Flash in master branch"
[master 291fec5] changes by Flash in master branch
 Committer: Sneha Mishra <smccr@umkc.edu>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:

    git config --global user.name "Your Name"
    git config --global user.email you@example.com

After doing this, you may fix the identity used for this commit with:

    git commit --amend --reset-author

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

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$ git push origin
Counting objects: 3, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 312 bytes | 0 bytes/s, done.
Total 3 (delta 2), reused 0 (delta 0)
To file:///q/Desktop//myRemoteGit.git
   9589356..291fec5  master -> master

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalFlash (master)
$ cd
```

13.3 Changes made by Savitar local Repo

```
BoardPanel.java ⊠
1    //Chnages made by Savitar in master branch
2    package org.psnbtech;
3
4    import java.awt.Color;
5    import java.awt.Dimension;
6    import java.awt.Font;
7    import java.awt.Graphics;
8
9    import javax.swing.JPanel;
10
```

13.4 Conflicts faced

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master)
$ vi BoardPanel.java

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master)
$ git add BoardPanel.java

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master)
$ git commit -m "Changes made by Savitar in master"
[master 6100013] Changes made by Savitar in master
 Committer: Sneha Mishra <smccr@umkc.edu>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:

    git config --global user.name "Your Name"
    git config --global user.email you@example.com

After doing this, you may fix the identity used for this commit with:

    git commit --amend --reset-author

 1 file changed, 1 insertion(+)

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master)
$ git push origin
To file:///q/Desktop//myRemoteGit.git
 ! [rejected]        master -> master (non-fast-forward)
error: failed to push some refs to 'file:///q/Desktop//myRemoteGit.git'
hint: Updates were rejected because the tip of your current branch is behind
hint: its remote counterpart. Integrate the remote changes (e.g.
hint: 'git pull ...') before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master)
$ git pull origin
Auto-merging BoardPanel.java
CONFLICT (content): Merge conflict in BoardPanel.java
Automatic merge failed; fix conflicts and then commit the result.

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master|MERGING)
```

14. Resolving conflict

```
smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master|MERGING)
$ git checkout  --ours BoardPanel.java

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master|MERGING)
$ git checkout  --theirs BoardPanel.java

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master|MERGING)
$ git add BoardPanel.java

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master|MERGING)
$ git pull origin
error: You have not concluded your merge (MERGE_HEAD exists).
hint: Please, commit your changes before merging.
fatal: Exiting because of unfinished merge.

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master|MERGING)
$ git commit -m "using theirs"
[master beecd1f] using theirs
 Committer: Sneha Mishra <smccr@umkc.edu>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:

    git config --global user.name "Your Name"
    git config --global user.email you@example.com

After doing this, you may fix the identity used for this commit with:

    git commit --amend --reset-author


smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master)
$ git pull origin
Already up-to-date.

smccr@KC-SCE462LAB-08 MINGW64 /q/Desktop/myLocalSavitar (master)
```

References:

1. https://www.atlassian.com/git/tutorials/comparing-workflows
2. https://confluence.atlassian.com/bitbucket/workflow-for-git-feature-branching-814201830.html
3. https://stackoverflow.com/questions/161813/how-to-resolve-merge-conflicts-in-git