Version Control with Git (A time travel machine)

❖ Basic Git commands.

Create a git repository	**git init**
Add a file to snapshot	**git add <file_name>**
Add all files to snapshot	**git add .**
Checking the status of snapshot	**git status**
Saving snapshot (commit)	**git commit -m "message"**
Checking history of commits	**git log --oneline**
Detailed history of commits	**git whatchanged**
Checking out previously saved snapshots	**git checkout <commit_id>**
Going back to current state	**git checkout master**

❖ Demo: Git version control in R.

   a. Loading built-in dataset in R and saving it as "mydata.RData" file under "dvc" folder.

```r
data("USArrests")
# The USArrests dataset contains statistics on violent crime rates per
100,000 residents for each of the 50 US states in 1973.
# Murder - Murder arrests per 100,000
# Assault - Assault arrests per 100,000
# UrbanPop - Percent urban population
# Rape - Rape arrests per 100,000

save.image(file.choose()) #save file as mydata.RData under "dvc" folder
load(file.choose())
```

   b. Create git repository under "dvc" folder. Add file to snapshot. Save the snapshot with message "initial commit"
      > git init
      > git add mydata.RData
      > git commit -m "initial commit"

   c. Manipulating data and saving it. Then, adding this modified data file to snapshot and saving the snapshot with a message.

```r
USArrests <- subset(USArrests, Murder > 10) #keeping observations having
Murder value greater than 10
save.image(file.choose())
```
      > git add mydata.RData
      > git commit -m "filtered dataset"

d. Exporting scatter plots and creating a report with a new commit message.

```
jpeg('plot.jpg')
plot(USArrests)
dev.off()
```

- Create a file "report.docx" and import the plot.
- Add the new files and commit.

> git add plot.jpg report.docx

> git commit -m "creating a report with plot"

e. Add description of the plot in "report.docx" file and commit.

> git add report.docx

> git commit -m "revised report with description"

Now check history of commits, its details, checkout previous versions, and coming back to current state.