4.git重置

三棵树

- HEAD:当前分支引用的的指针，它指向的是当前分支的最后一次提交，也就是下一次提交的父节点。

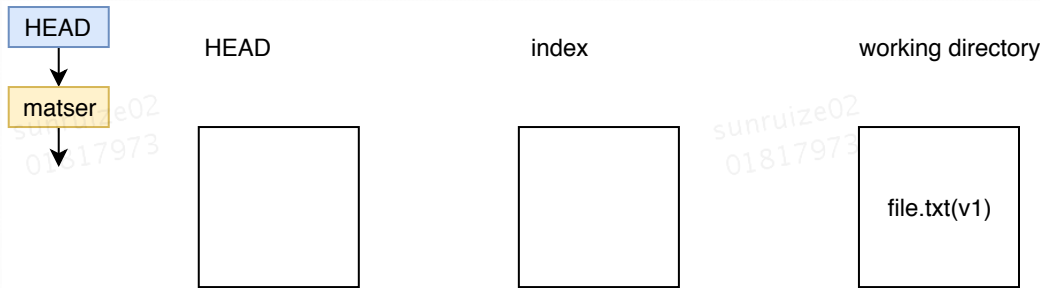- Index：Git的暂存区域，也就是下一次git commit时Git看起来的样子。

- 工作目录

工作流程

```
∧  代码块

1   #首先创建文件夹，里面存在file.txt文件，使用git init初始化仓库
2   admindeMacBook-Pro:MyTestProjects sunruize$ mkdir resetTest
3   admindeMacBook-Pro:MyTestProjects sunruize$ cd resetTest/
4   admindeMacBook-Pro:resetTest sunruize$ echo 'v1' > file.txt
5   admindeMacBook-Pro:resetTest sunruize$ git init
6   Initialized empty Git repository in /Users/sunruize/MyTestProjects/resetTest/.g
```

```
∧  代码块

1   #查看refs目录下文件master分支还未创建，查看HEAD文件指向master分支,index文件也未创建
2   admindeMacBook-Pro:resetTest sunruize$ find .git/refs/
3   .git/refs/
4   .git/refs//heads
5   .git/refs//tags
6
7   admindeMacBook-Pro:resetTest sunruize$ cat .git/HEAD
8   ref: refs/heads/master
9   admindeMacBook-Pro:resetTest sunruize$ ls .git/
10  HEAD      config      hooks    objects
11  branches  description info     refs
```
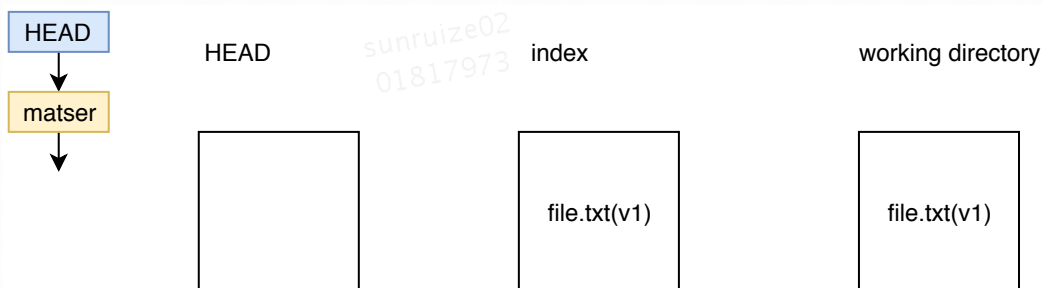
三棵树状态如图所示，此时工作目录只有内容。

⌃ 代码块

```
1    #暂存文件，查看三棵树内容
2    admindeMacBook-Pro:resetTest sunruize$ git add file.txt
3    admindeMacBook-Pro:resetTest sunruize$ ls .git/
4    HEAD    config    hooks    info    refs
5    branches  description index    objects
6
7    #查看index文件内容
8    admindeMacBook-Pro:resetTest sunruize$ git ls-files --stage
9    100644 626799f0f85326a8c1fc522db584e86cdfccd51f 0 file.txt
10   #此时master分支依旧未创建
11   admindeMacBook-Pro:resetTest sunruize$ cat .git/HEAD
12   ref: refs/heads/master
13   admindeMacBook-Pro:resetTest sunruize$ find .git/refs/
14   .git/refs/
15   .git/refs//heads
16   .git/refs//tags
```

三棵树状态如图所示

⌃ 代码块

```
1    #运行git commit命令
2    admindeMacBook-Pro:resetTest sunruize$ git commit -m 'first commit'
3    [master (root-commit) 6fc6939] first commit
4     1 file changed, 1 insertion(+)
5     create mode 100644 file.txt
6     #master分支已被创建
7    admindeMacBook-Pro:resetTest sunruize$ find .git/refs/
8    .git/refs/
9    .git/refs//heads
10   .git/refs//heads/master
11   .git/refs//tags
12   #第一次commit对象的引用
13   admindeMacBook-Pro:resetTest sunruize$ cat .git/refs/heads/master
14   6fc6939e33eba51301cd2af210339213e5350493
```
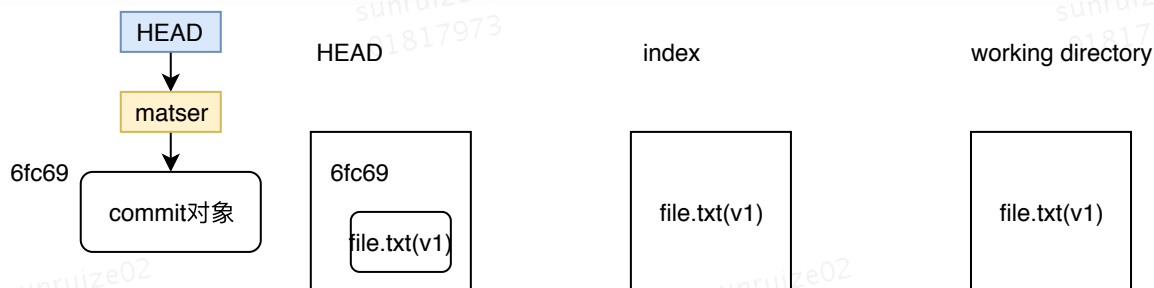
```
15   admindeMacBook-Pro:resetTest sunruize$ git cat-file -t
     6fc6939e33eba51301cd2af210339213e5350493
16   commit
17   admindeMacBook-Pro:resetTest sunruize$ git cat-file -p
     6fc6939e33eba51301cd2af210339213e5350493
18   tree cc5fda52eb3ed07cce6357ac11e392cd2dbf6d16
19   author sunruize02 <sunruize02@meituan.com> 1553049590 +0800
20   committer sunruize02 <sunruize02@meituan.com> 1553049590 +0800
21
22   first commit
23
24   #查看tree对象
25   admindeMacBook-Pro:resetTest sunruize$ git cat-file -p
     cc5fda52eb3ed07cce6357ac11e392cd2dbf6d16
26   100644 blob 626799f0f85326a8c1fc522db584e86cdfccd51f   file.txt
27   #查看blob对象
28   admindeMacBook-Pro:resetTest sunruize$ git cat-file -p
     626799f0f85326a8c1fc522db584e86cdfccd51f
29   v1
```

三棵树状态如图所示：

代码块

```
1    #此时运行git status，会发现没有任何改动，因为三棵树完全一样
2    admindeMacBook-Pro:resetTest sunruize$ git status
3    On branch master
4    nothing to commit, working tree clean
5
6    #更改file.txt
7    admindeMacBook-Pro:resetTest sunruize$ echo 'v2' > file.txt
8    admindeMacBook-Pro:resetTest sunruize$ git status
9    On branch master
10   Changes not staged for commit:            #==================》》》》》文件已修改但i
     暂存区域
```

三棵树状态如图所示：

∧ 代码块

```
1   #暂存file.txt文件
2   admindeMacBook-Pro:resetTest sunruize$ git add file.txt
3   #查看index文件
4   admindeMacBook-Pro:resetTest sunruize$ git ls-files --stage
5   100644 8c1384d825dbbe41309b7dc18ee7991a9085c46e 0 file.txt
6   admindeMacBook-Pro:resetTest sunruize$ git cat-file -p
    8c1384d825dbbe41309b7dc18ee7991a9085c46e
7   v2
8   admindeMacBook-Pro:resetTest sunruize$ git status
9   On branch master
10  Changes to be committed:            #==================》》》》》修改未提交
```
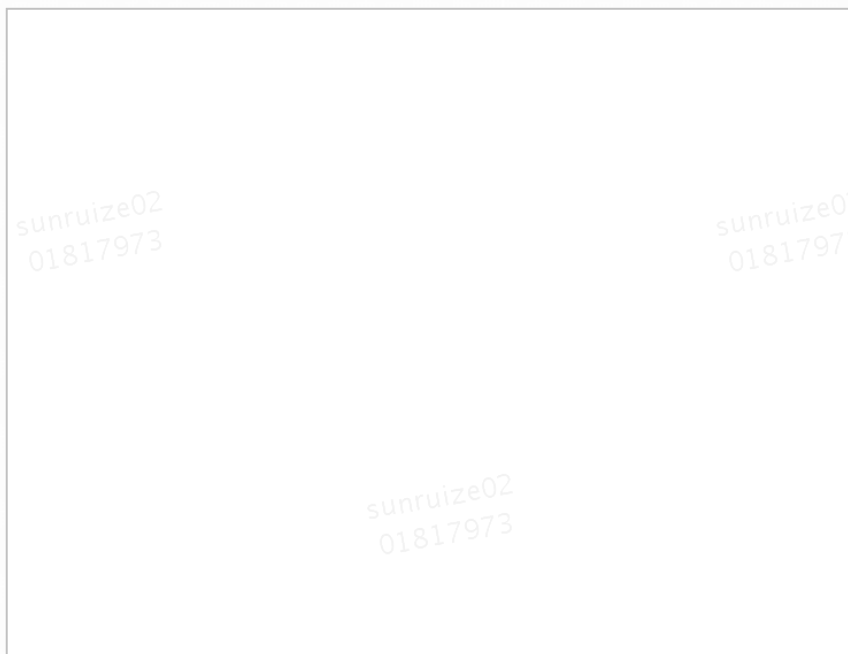
三棵树状态如图所示：

∧ 代码块

```
1   #执行git commit
2   admindeMacBook-Pro:resetTest sunruize$ git commit -m 'second commit'
3   [master 0cf4ef2] second commit
4    1 file changed, 1 insertion(+), 1 deletion(-)
5
6   admindeMacBook-Pro:resetTest sunruize$ cat .git/HEAD
7   ref: refs/heads/master
8   admindeMacBook-Pro:resetTest sunruize$ cat .git/refs/heads/master
9   0cf4ef2dc75dad201ab4f512e4eacbbe8f0057f0
10  #查看commit对象
11  admindeMacBook-Pro:resetTest sunruize$ git cat-file -p
    0cf4ef2dc75dad201ab4f512e4eacbbe8f0057f0
12  tree 257330bfc3b1cce445c8bf7202d88eca9ffff025
13  parent 6fc6939e33eba51301cd2af210339213e5350493
```

```
14   author sunruize02 <sunruize02@meituan.com> 1553050963 +0800
15   committer sunruize02 <sunruize02@meituan.com> 1553050963 +0800
16
17   second commit
18   #执行git status
19   admindeMacBook-Pro:resetTest sunruize$ git status
20   On branch master
21   nothing to commit, working tree clean
```

三棵树状态如图所示

git重置

∧ 代码块

```
1    #作第三次修改
2    admindeMacBook-Pro:resetTest sunruize$ echo 'v3' > file.txt
3    admindeMacBook-Pro:resetTest sunruize$ git add file.txt
4    admindeMacBook-Pro:resetTest sunruize$ git commit -m 'third commit'
5    [master 4210517] second commit
6     1 file changed, 1 insertion(+), 1 deletion(-)
7
8     #查看当前HEAD以及master引用
9    admindeMacBook-Pro:resetTest sunruize$ cat .git/HEAD
10   ref: refs/heads/master
11   admindeMacBook-Pro:resetTest sunruize$ cat .git/refs/heads/master
12   421051792718db8e737472cd8ec6293965987705
13   admindeMacBook-Pro:resetTest sunruize$ git cat-file -p
     421051792718db8e737472cd8ec6293965987705
14   tree a7949a02518883287c308f0b47e2a4934b111cc3
15   parent 0cf4ef2dc75dad201ab4f512e4eacbbe8f0057f0
```

```
16    author sunruize02 <sunruize02@meituan.com> 1553051747 +0800
17    committer sunruize02 <sunruize02@meituan.com> 1553051747 +0800
18
19    third commit
```

三棵树当前状态如图所示：

git reset --soft

```
1    #执行 git commit [commitID] --soft
2    admindeMacBook-Pro:resetTest sunruize$ git reset
     0cf4ef2dc75dad201ab4f512e4eacbbe8f0057f0 --soft
3    admindeMacBook-Pro:resetTest sunruize$ git ls-files --stage
4    100644 29ef827e8a45b1039d908884aae4490157bcb2b4 0 file.txt
5    admindeMacBook-Pro:resetTest sunruize$ git cat-file -p
     29ef827e8a45b1039d908884aae4490157bcb2b4
6    v3
```

三棵树状态如图所示,Git所做的操作仅仅是将HEAD指向对应的commit对象

git reset --mixed /git reset

∧ 代码块

```
1    #执行 git commit [commitID] --mixed
2    admindeMacBook-Pro:resetTest sunruize$ git reset
     0cf4ef2dc75dad201ab4f512e4eacbbe8f0057f0
3    Unstaged changes after reset:
4    M file.txt
5    admindeMacBook-Pro:resetTest sunruize$ git ls-files --stage
6    100644 8c1384d825dbbe41309b7dc18ee7991a9085c46e 0 file.txt
7    admindeMacBook-Pro:resetTest sunruize$ git cat-file -p
     8c1384d825dbbe41309b7dc18ee7991a9085c46e
8    v2
```

git reset --hard

∧ 代码块

```
1    #执行 git commit [commitID] --hard
2    admindeMacBook-Pro:resetTest sunruize$ git reset
     0cf4ef2dc75dad201ab4f512e4eacbbe8f0057f0 --hard
3    HEAD is now at 0cf4ef2 second commit
4
5    admindeMacBook-Pro:resetTest sunruize$ git ls-files --stage
6    100644 8c1384d825dbbe41309b7dc18ee7991a9085c46e 0 file.txt
7    admindeMacBook-Pro:resetTest sunruize$ git cat-file -p
     8c1384d825dbbe41309b7dc18ee7991a9085c46e
8    v2
9    admindeMacBook-Pro:resetTest sunruize$ cat file.txt
10   v2
```

三棵树状态如图所示

git reset HEAD~

∧ 代码块

```
1    #重置到上一次提交
2    admindeMacBook-Pro:resetTest sunruize$ git reset --hard HEAD~
3    HEAD is now at 6fc6939 first commit
```

git reset HEAD <file>

∧ 代码块

```
1    #git reset HEAD <file>将暂存区的修改撤销
2    admindeMacBook-Pro:resetTest sunruize$ git reset --hard HEAD~
3    HEAD is now at 6fc6939 first commit
     admindeMacBook-Pro:resetTest sunruize$ echo 'v2' > file.txt
```

```
5    admindeMacBook-Pro:resetTest sunruize$ git add file.txt
6    admindeMacBook-Pro:resetTest sunruize$ git ls-files --stage
7    100644 8c1384d825dbbe41309b7dc18ee7991a9085c46e 0 file.txt
8    admindeMacBook-Pro:resetTest sunruize$ git cat-file -p
     8c1384d825dbbe41309b7dc18ee7991a9085c46e
9    v2
10   admindeMacBook-Pro:resetTest sunruize$ git reset HEAD file.txt
11   Unstaged changes after reset:
12   M file.txt
13   admindeMacBook-Pro:resetTest sunruize$ git ls-files --stage
14   100644 626799f0f85326a8c1fc522db584e86cdfccd51f 0 file.txt
15   admindeMacBook-Pro:resetTest sunruize$ git cat-file -p
     626799f0f85326a8c1fc522db584e86cdfccd51f
16   v1
```

检出——git checkout