

第四章

分支(Branch)



内容大纲

1. 什么是分支, 为什么要使用分支
2. 新提交和对分支的影响
3. 创建新分支+切换到分支
4. Unmodified vs modified files
5. Commits是如何链接起来的



当前项目目录状态

项目目录: shengxiao-bobo

工作目录



12_shengxiao.txt

本地仓库(.git)

暂存区(index)



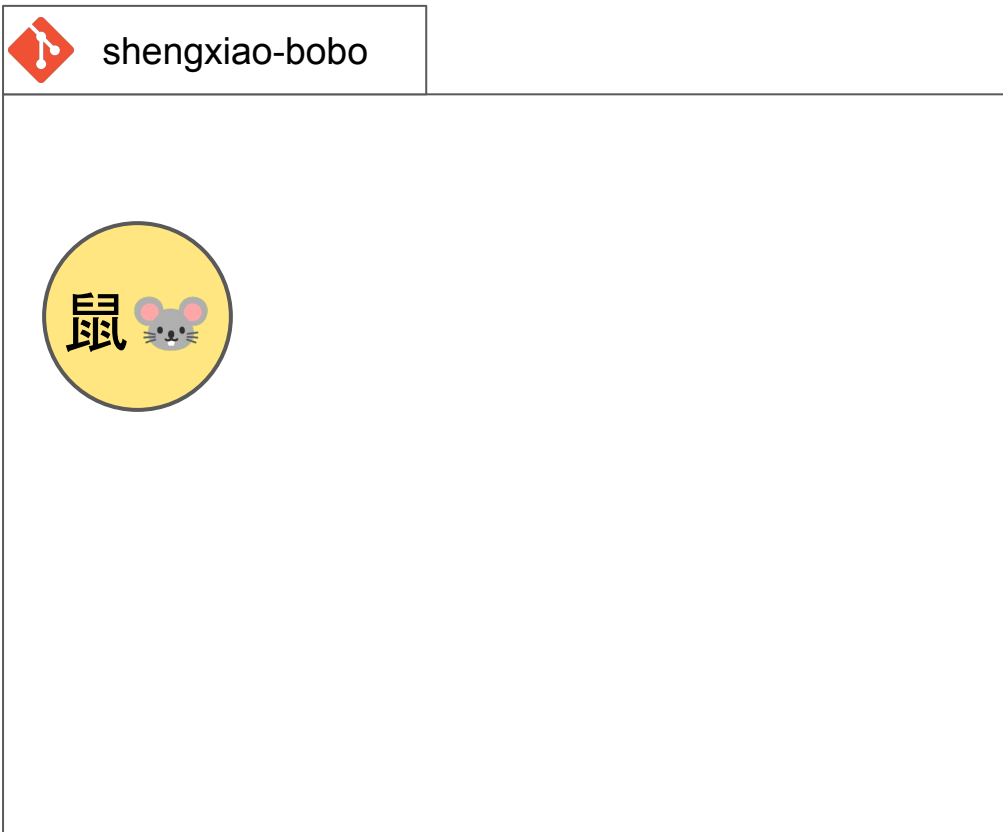
12_shengxiao.txt

提交历史(objects)



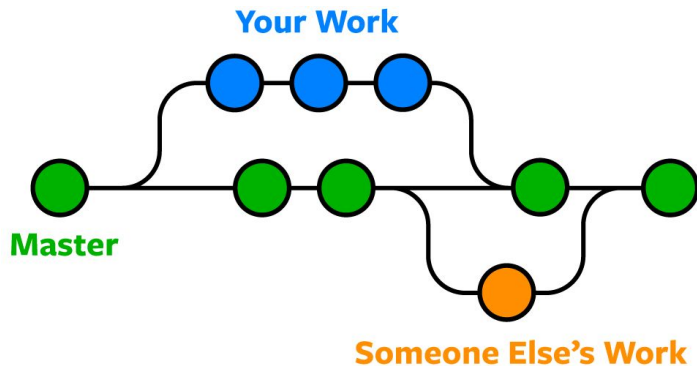
33bf3d1

当前仓库状态(简化)

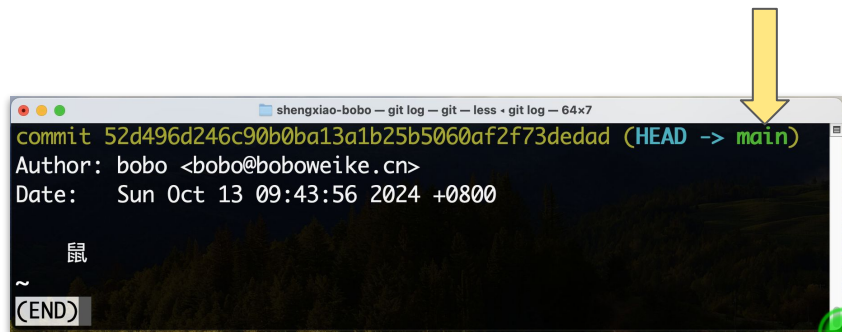


什么是分支？

- 多条开发线(lines of development)支持多人合作
- 每个分支表示项目的一个独立版本
- 常用模式: 主分支(main/master)+主题(topic)/功能(feature)分支
- 主题/功能分支通常是短期的, 最终被合并入主分支后删除
- 合并有两种方式: merging or rebasing(后续讲解)



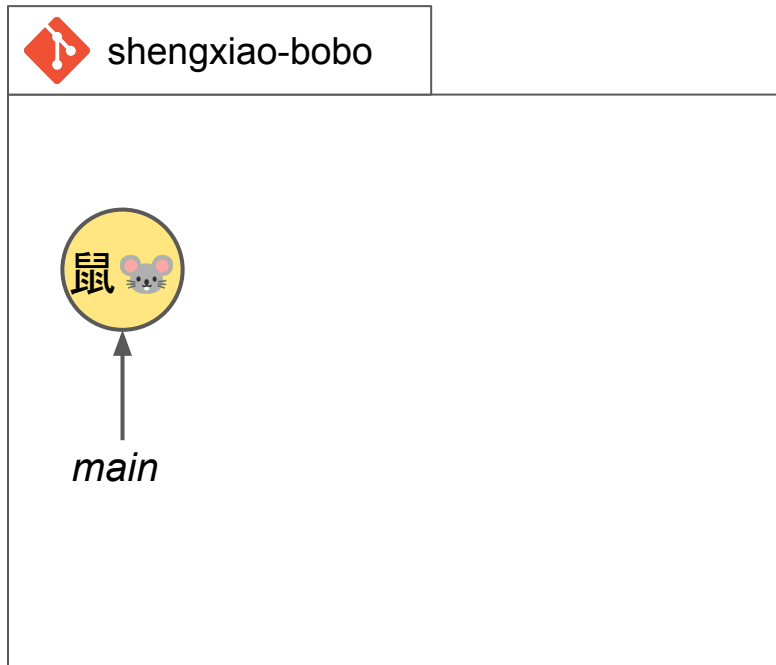
分支是指向提交(commit)的可移动指针



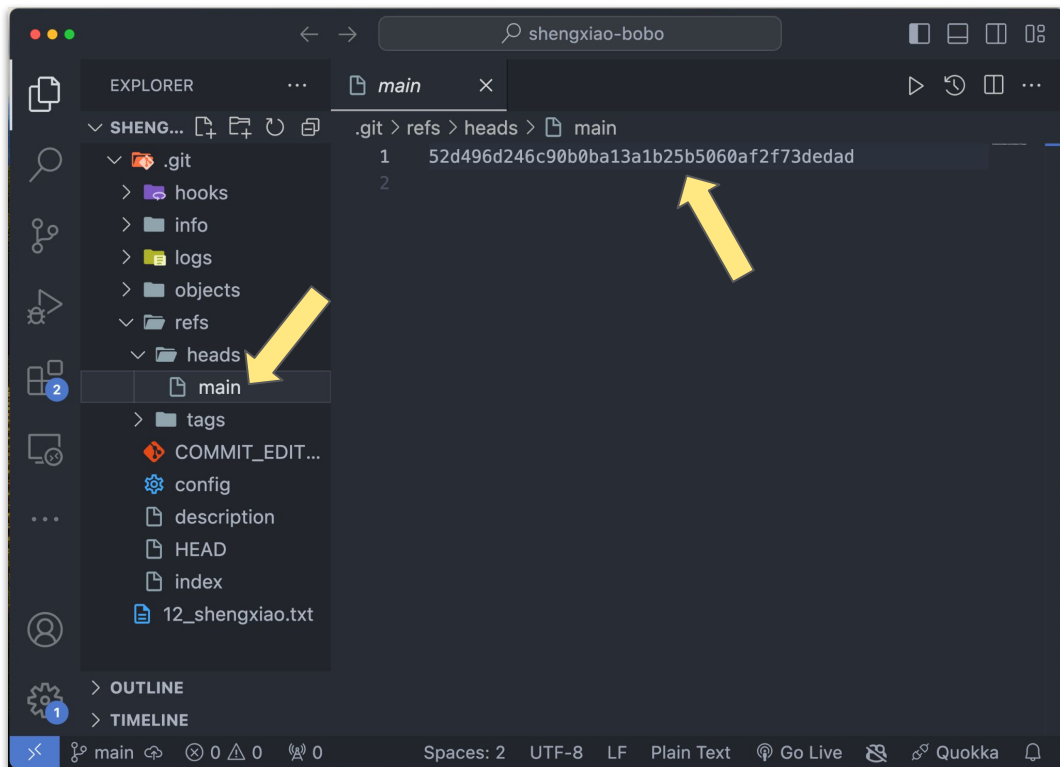
```
shengxiao-bobo — git log — git — less — git log — 64x7
commit 52d496d246c90b0ba13a1b25b5060af2f73dedad (HEAD -> main)
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 09:43:56 2024 +0800

鼠

~
(END)
```



查看heads目录中的main分支



heads中的每一个文件表示一个本地分支，其中是对最新提交的引用

概念 ~ Unmodified vs Modified Files

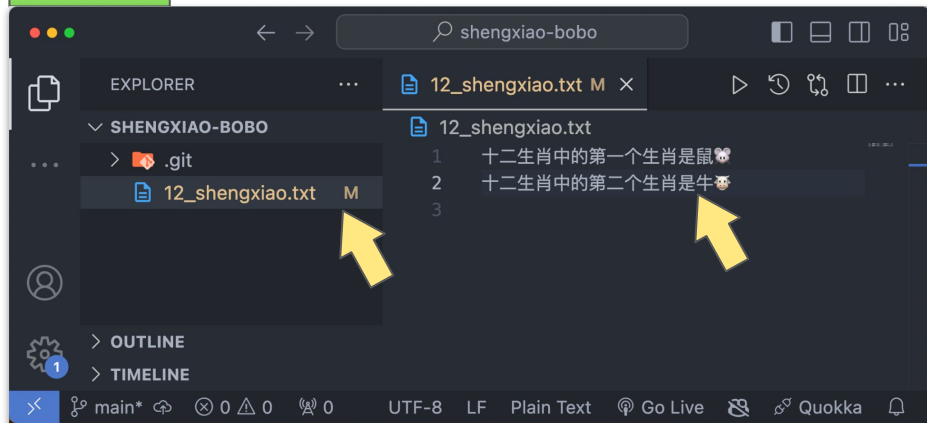
- 工作目录中已被Git跟踪的文件可以有两种状态：
 - Unmodified files: 自上次提交后未被修改过的文件
 - Modified files: 自上次提交后又被修改的文件
 - 通过git status查看工作目录和暂存区状态, 可展示哪些modified files还未被添加到暂存区

CONCEPT

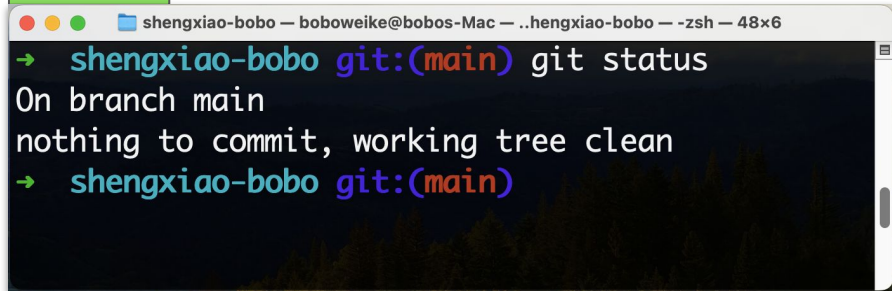


实操～添加生肖牛🐮

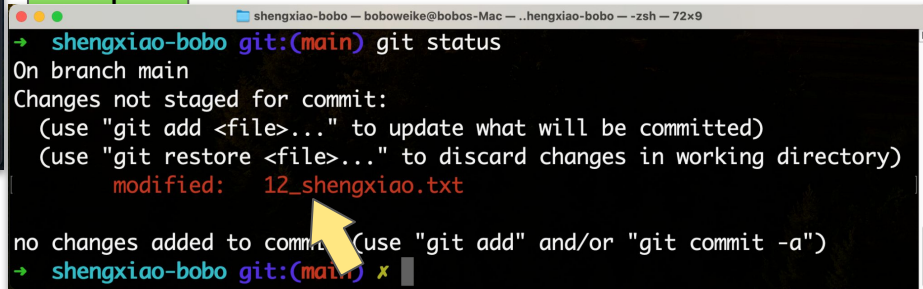
Step 2



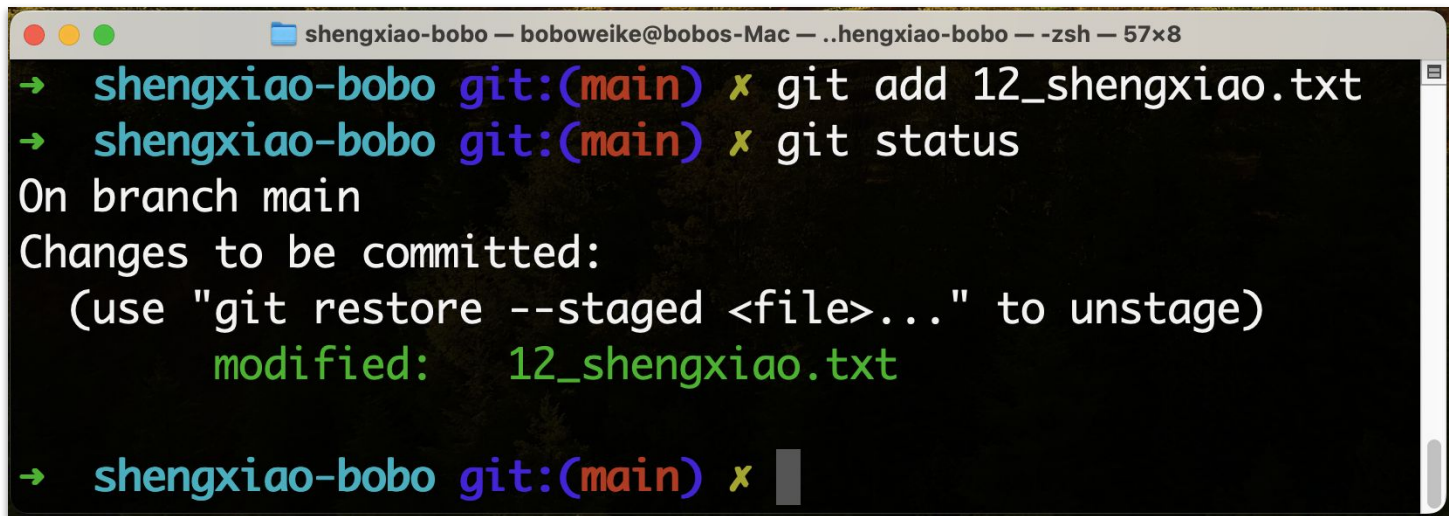
Step 1



Step 3



实操～将修改文件添加到暂存区



```
shengxiao-bobo — boboweike@bobos-Mac — ..hengxiao-bobo — zsh — 57x8
→ shengxiao-bobo git:(main) x git add 12_shengxiao.txt
→ shengxiao-bobo git:(main) x git status
On branch main
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
       modified:   12_shengxiao.txt

→ shengxiao-bobo git:(main) x
```

提交生肖牛🐮

```
shengxiao-bobo — boboweike@bobos-Mac — ..hengxiao-bobo — -zsh — 51x5
→ shengxiao-bobo git:(main) ✕ git commit -m "牛"
[main 779dccd] 牛
1 file changed, 1 insertion(+)
→ shengxiao-bobo git:(main)
```

```
shengxiao-bobo — git log — git — less — git log — 63x15
commit 779dcccdfacdf279ce53993d46518a666e29a7007 (HEAD -> main)
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 13:23:39 2024 +0800

    牛

commit 52d496d246c90b0ba13a1b25b5060af2f73dedad
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 09:43:56 2024 +0800

    鼠

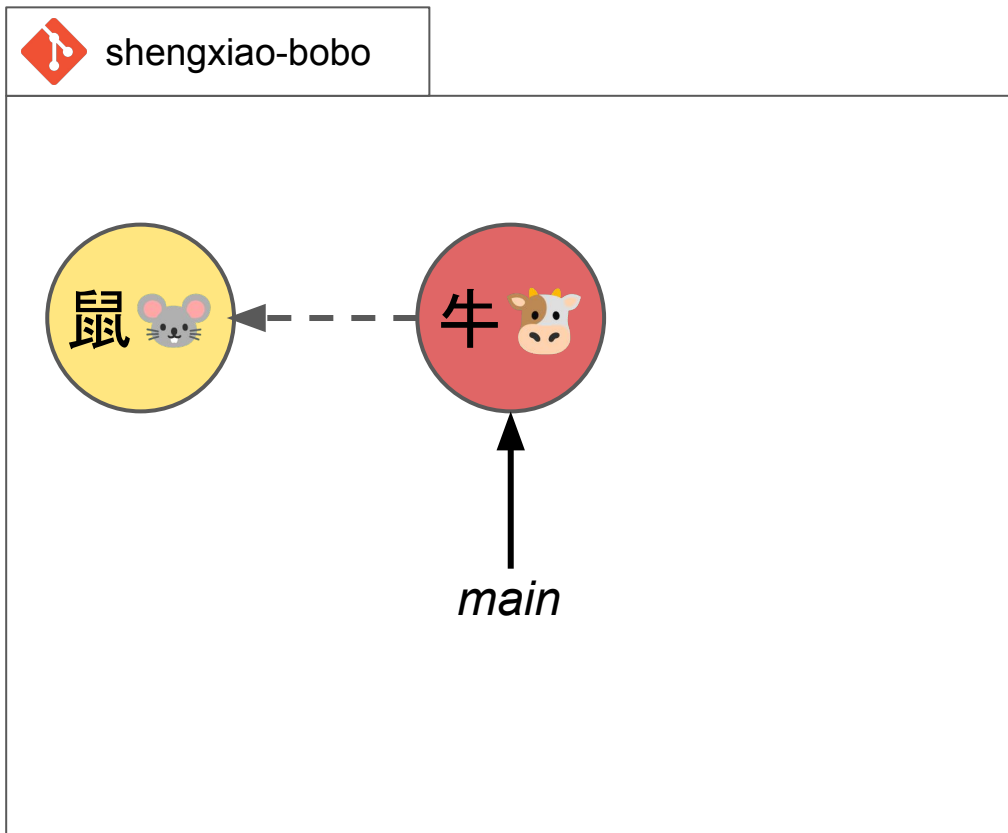
~
~
(END)
```

新提交



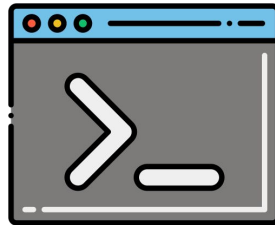
当前仓库状态

- 灰色虚线箭头表示父链接(后续进一步讲解), 可视化提交历史
- 黑色实线箭头表示分支指针



命令～新建分支

- ***git branch***
 - 列出本地分支
- ***git branch <new_branch_name>***
 - 创建一个分支



实操～创建分支

```
$> git branch
```

```
* main
```

```
$> git branch feature
```

```
$> git branch
```

```
feature
```

```
* main
```

```
$> git log
```

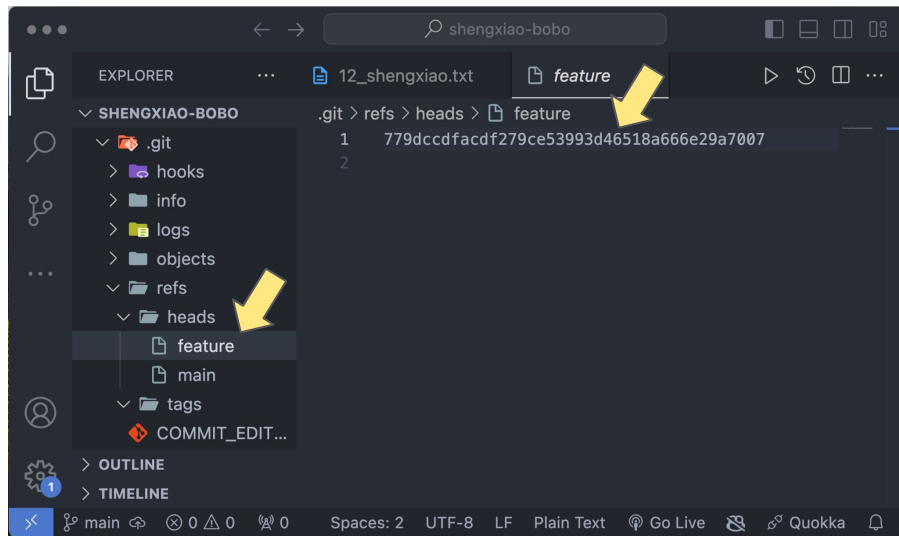
```
shengxiao-bobo — git log — less • git log — 74x14
commit 779dccdfacdf279ce53993d46518a666e29a7007 (HEAD -> main, feature)
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 13:23:39 2024 +0800

    牛

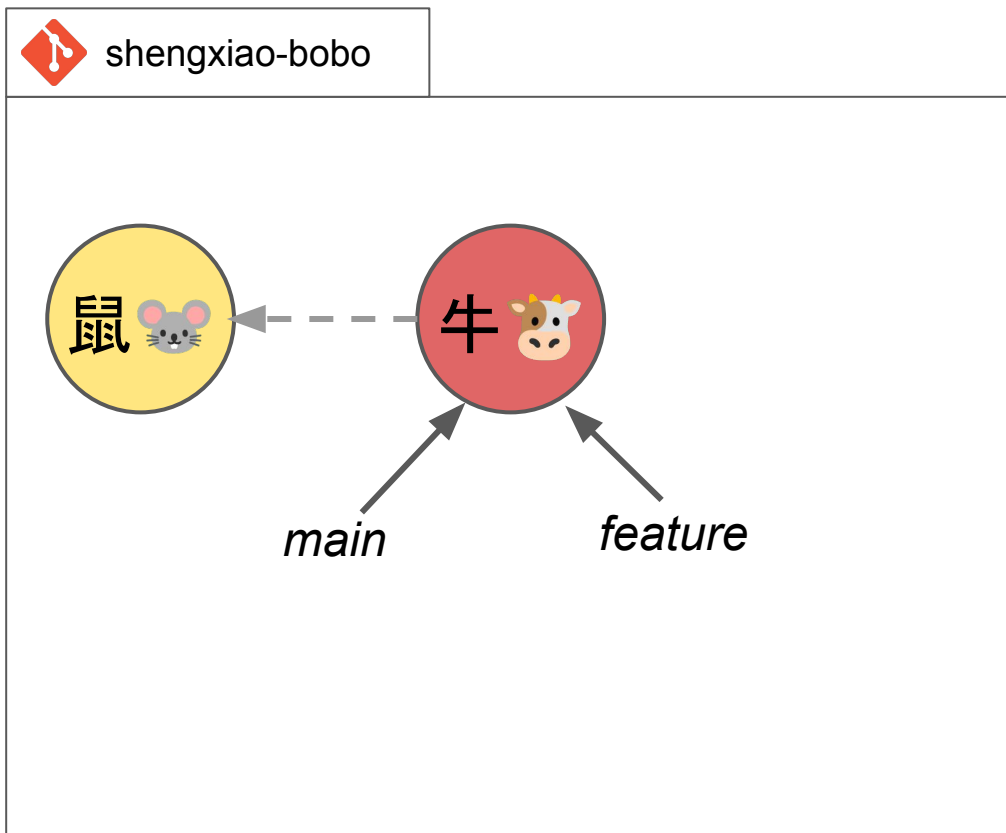
commit 52d496d246c90b0ba13a1b25b5060af2f73dedad
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 09:43:56 2024 +0800

    鼠

~
(END)
```

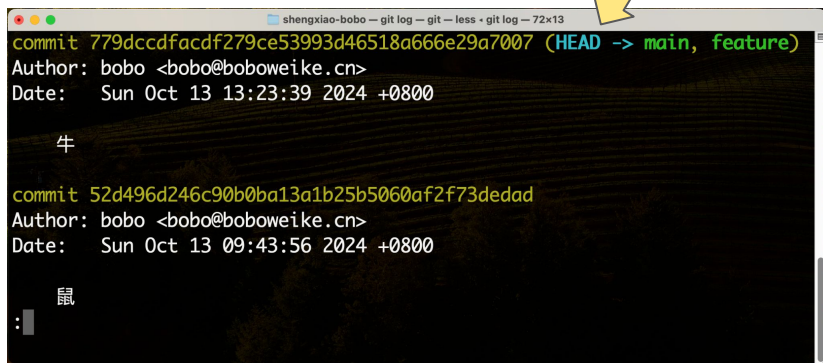


当前仓库状态



什么是HEAD?

- 指向当前你所在分支的指针
- 惯例全大写
- 可通过git log或git branch查看
- HEAD和heads(.git > refs > heads)目录不同, heads目录中存放的是本地所有分支的指针

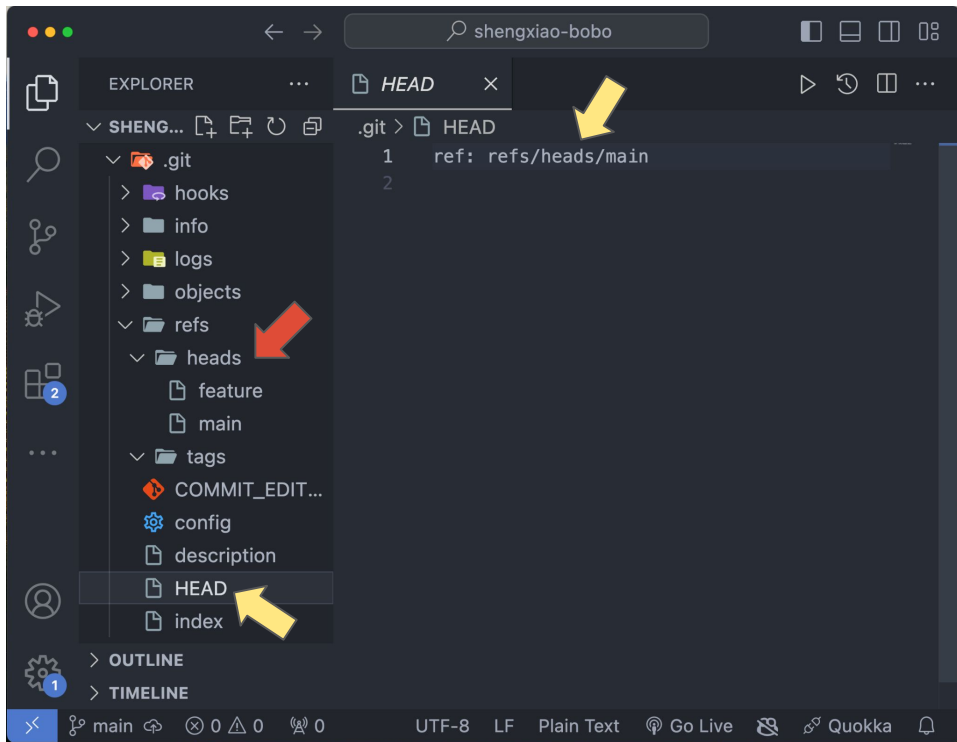


```
shengxiao-bobo - git log - git --less - git log --72x13
commit 779dcdcfacdf279ce53993d46518a666e29a7007 (HEAD -> main, feature)
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 13:23:39 2024 +0800

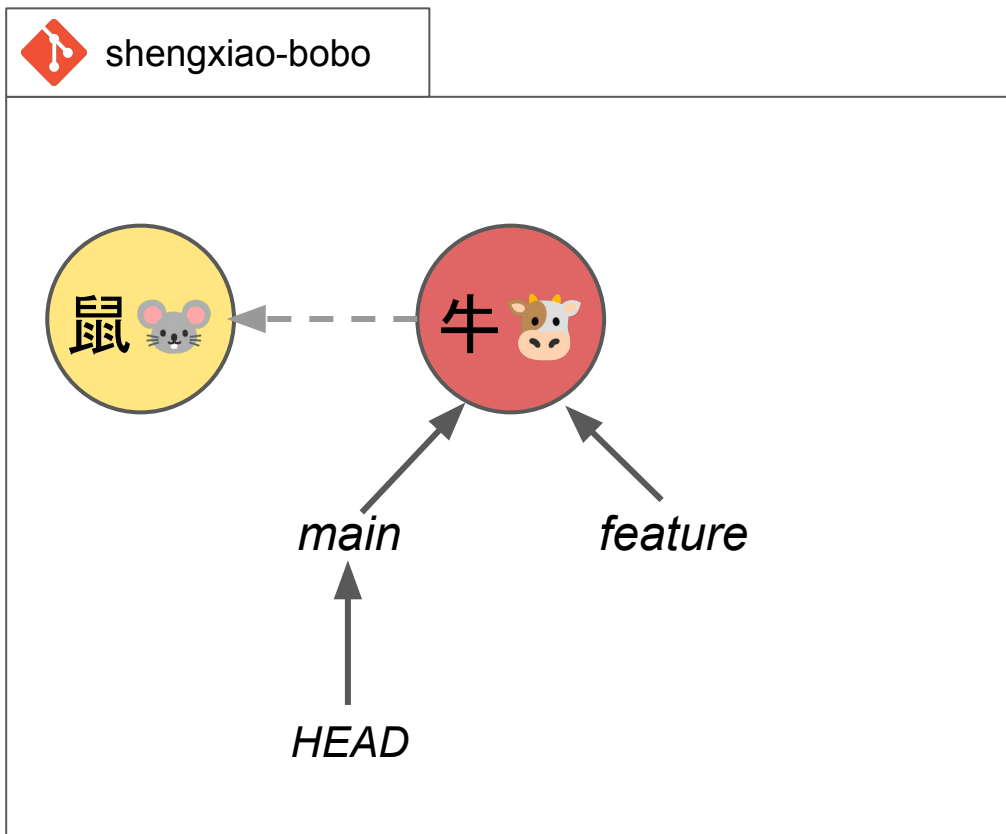
牛

commit 52d496d246c90b0ba13a1b25b5060af2f73dedad
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 09:43:56 2024 +0800

鼠
```

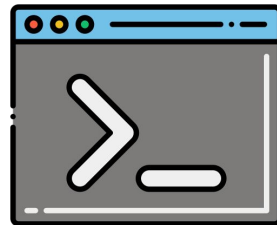


当前仓库状态



命令 ~ 切换分支

- ***git switch <branch_name>***
 - 切换分支
 - ≥ 2.23 版本
- ***git checkout <branch_name>***
 - 切换分支+额外工作(后续讲)



! 步骤:

1. 将HEAD指向目标分支
2. 使用和目标分支相对应的提交快照填充暂存区
3. 将暂存区内容拷贝到工作目录

实操～切换分支

```
$> git branch
```

```
feature
```

```
* main
```

```
$> git switch feature
```

```
Switched to branch 'feature'
```

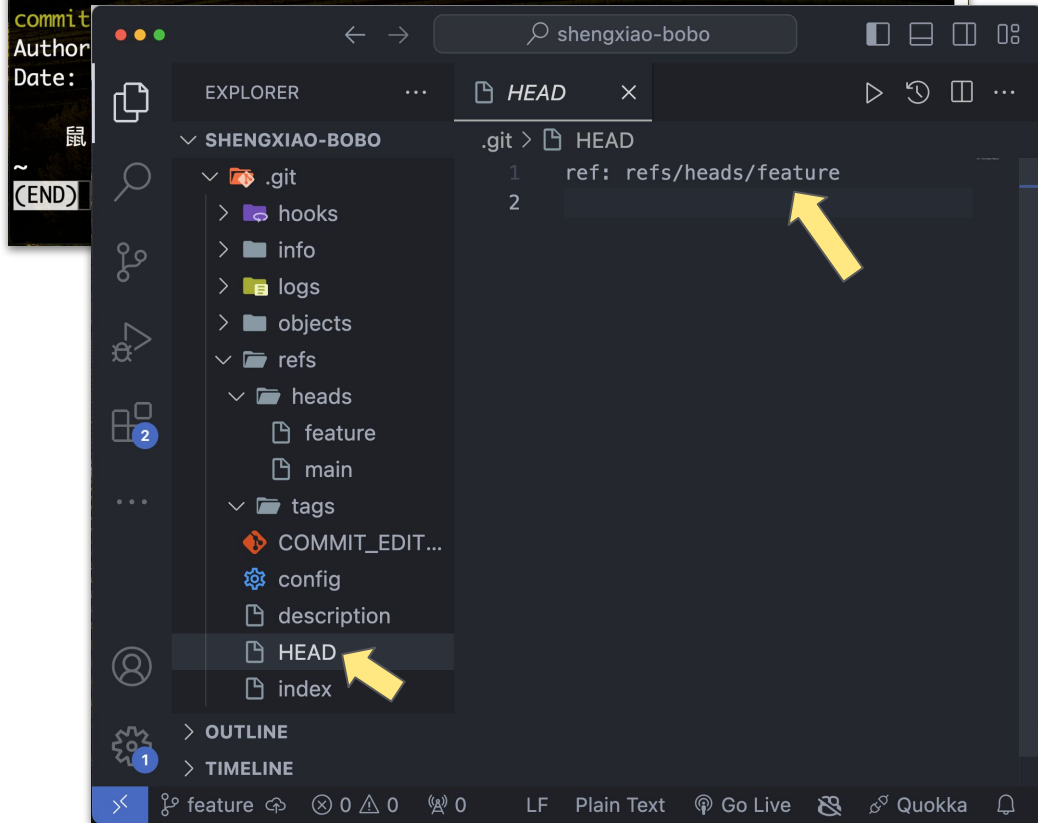
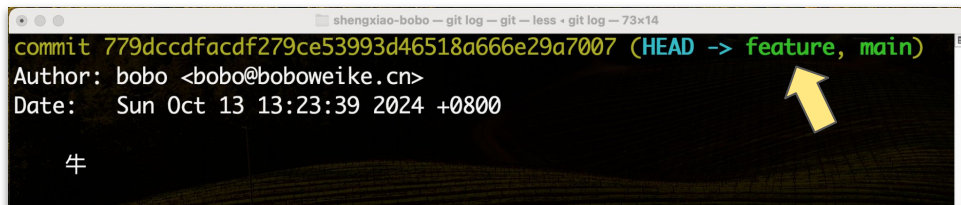
```
$> git branch
```

```
* feature
```

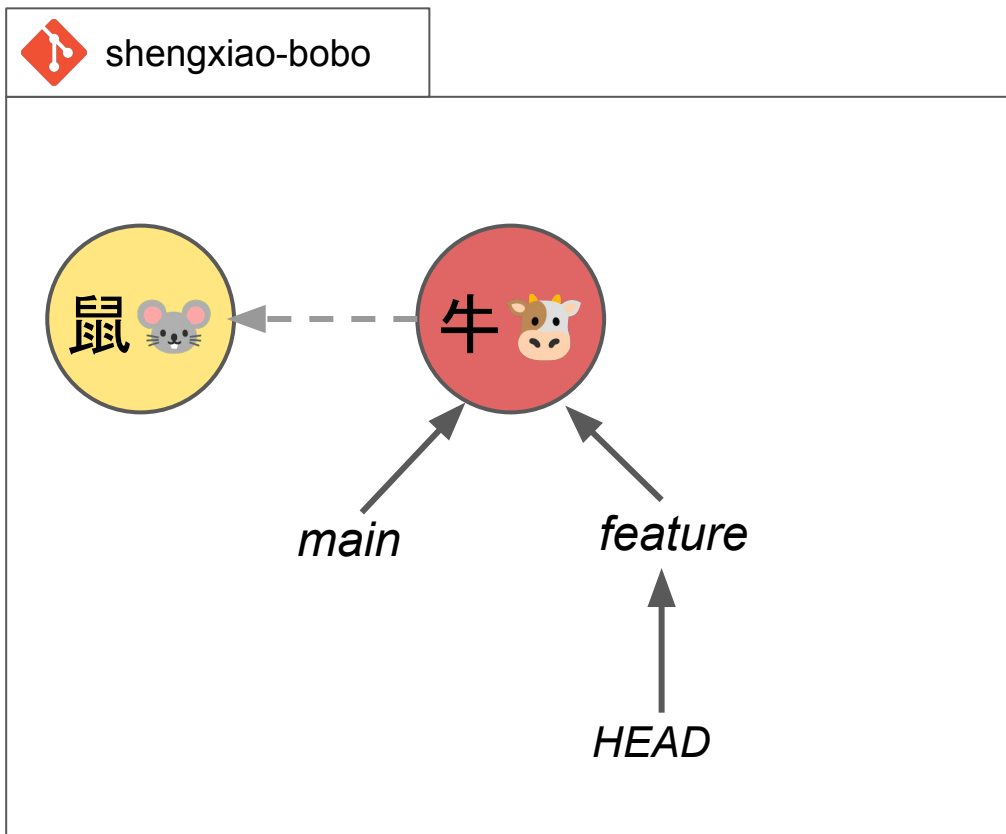
```
main
```

```
$> git log
```

```
shengxiao-bobo — git log — git — less — git log — 73x14
commit 779dcdcfacdf279ce53993d46518a666e29a7007 (HEAD -> feature, main)
Author: bobo <bobo@boboweike.cn>
Date: Sun Oct 13 13:23:39 2024 +0800
```



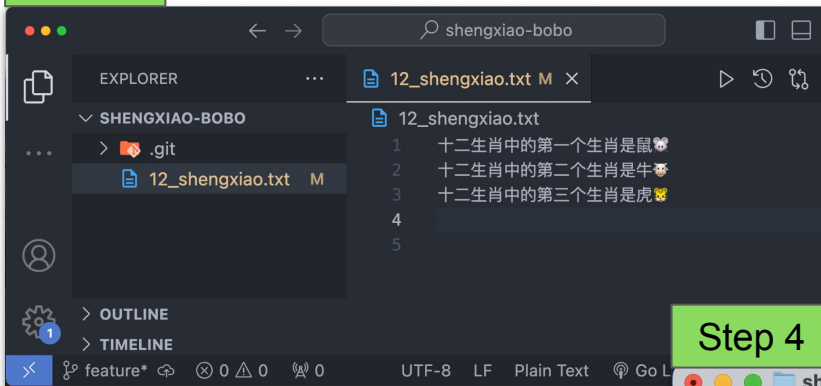
当前仓库状态



实操～添加第三个生肖虎

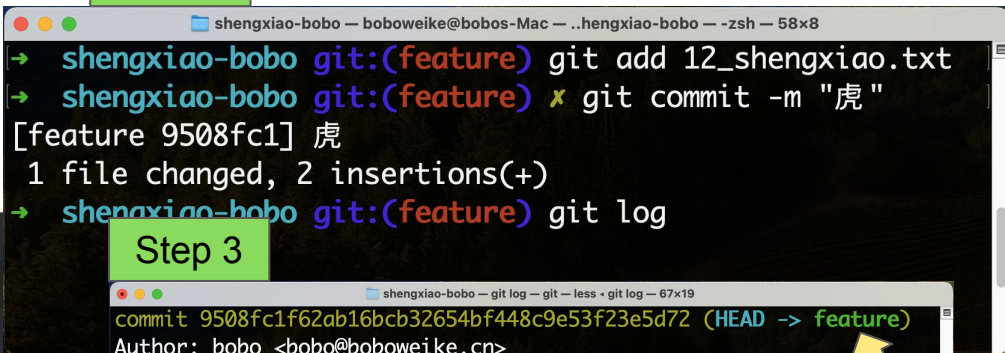
Step 2

Step 1



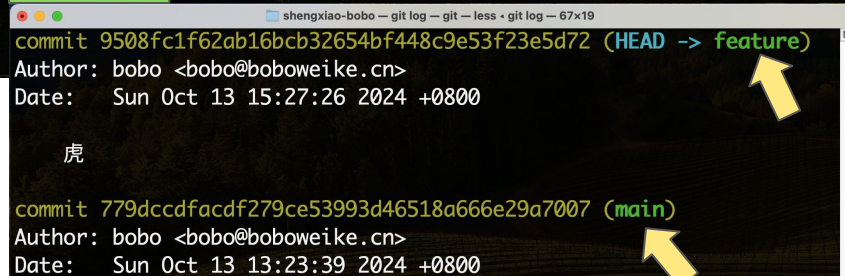
VS Code Explorer view showing the file `12_shengxiao.txt` in the `SHENGXIAO-BOBO` project. The file content is:

```
1 十二生肖的第一个生肖是鼠🐭  
2 十二生肖中的第二个生肖是牛🐮  
3 十二生肖中的第三个生肖是虎🐯  
4  
5
```



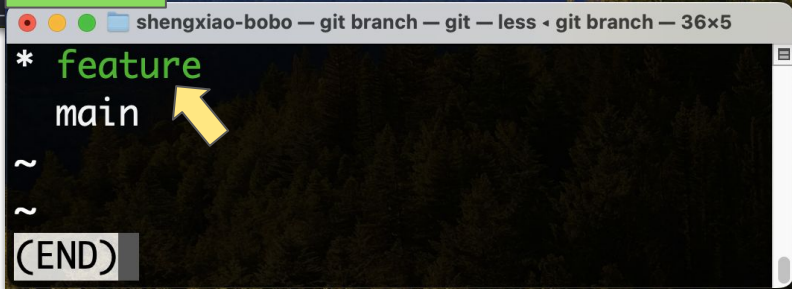
```
shengxiao-bobo — boboweike@bobos-Mac — ..hengxiao-bobo — zsh — 58x8  
→ shengxiao-bobo git:(feature) git add 12_shengxiao.txt  
→ shengxiao-bobo git:(feature) x git commit -m "虎"  
[feature 9508fc1] 虎  
1 file changed, 2 insertions(+)  
→ shengxiao-bobo git:(feature) git log
```

Step 3



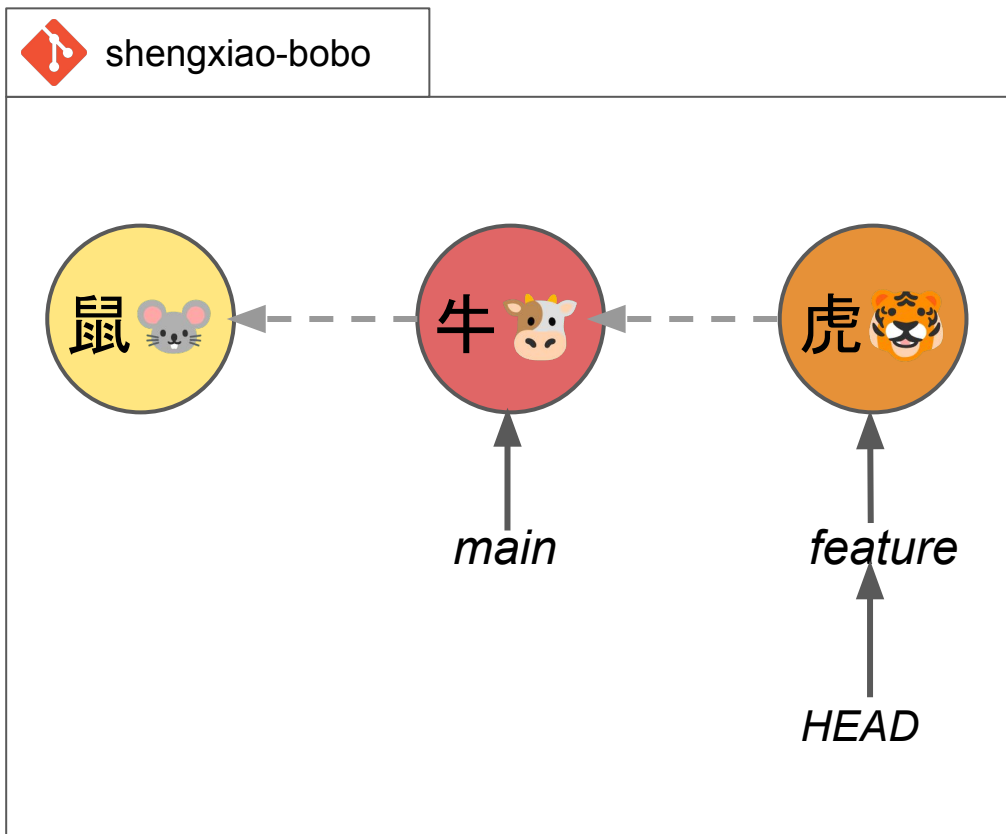
```
shengxiao-bobo — git log — git — less — git log — 67x19  
commit 9508fc1f62ab16bcb32654bf448c9e53f23e5d72 (HEAD -> feature)  
Author: bobo <bobo@boboweike.cn>  
Date: Sun Oct 13 15:27:26 2024 +0800  
  
虎  
  
commit 779dcdcfacdf279ce53993d46518a666e29a7007 (main)  
Author: bobo <bobo@boboweike.cn>  
Date: Sun Oct 13 13:23:39 2024 +0800
```

Step 4



```
shengxiao-bobo — git branch — git — less — git branch — 36x5  
* feature  
main  
~  
~  
(END)
```

当前仓库状态





小结和预告

- 本课小结
 - 分支
 - 表示不同的开发线(lines of development)
 - 指向commit的可移动的指针
 - 列出/创建/切换分支
 - HEAD指向当前所在分支的指针
 - Unmodified vs modified files
 - 提交后, 当前分支指针移动, 指向当前最新提交
 - Commit之间通过父链连接, 展示提交历史
- 下一课
 - 分支合并(merging)