

commit ??? .git ?? ??

????

1. hello.txt
2. git add hello.txt
3. git commit -m "Add hello"

1. ?? (Working Directory)

```
echo "Hello Git" > hello.txt
```

-
- Git

2. git add hello.txt

```
git add hello.txt
```

?? ??:

<code>.git/index</code>	
<code>.git/objects/</code>	hello.txt blob (SHA-1)

?? ? :

```
.git/  
└─ objects/
```

└─ 3a/

└─ 3efbed4aef... ← hello.txt blob

3. `git commit -m "Add hello"`

?? ??:

`.git/objects/`

tree	(hello.txt)
commit	, ,

```
.git/objects/  
├─ 3a/... (blob)  
├─ 47/... (tree)  
└─ a1/... (commit)
```

`.git/refs/heads/main`

-

```
refs/heads/main → a1b2c3d4e5...
```

`.git/HEAD`

- `ref: refs/heads/main` → main

`.git/logs/HEAD & logs/refs/heads/main`

- HEAD (reflog)

```
0000000 → a1b2c3d4 Commit: Add hello
```

?? ?? (?? 1? ?)

```

Working Directory      ← hello.txt
  ↓ git add
.git/index             ←
  ↓ git commit
.git/objects/
  ├── blob ( )
  ├── tree ( )
  └── commit ( )

.git/refs/heads/main  ← →
  ↑
.git/HEAD              ←
.git/logs/             ← HEAD/

```

?? ?? (?? ?)

```

cat .git/HEAD
# ref: refs/heads/main

cat .git/refs/heads/main
# a1b2c3d4e5...

git ls-tree HEAD
# 100644 blob 3a3efbed...hello.txt

git cat-file -p <>
# tree 47fa...
# author ...
# message: Add hello

```

??

<code>git add</code>	blob + index
<code>git commit</code>	tree + commit , ,

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