

1. Version Control Basics

- Version Control is a concept — a system that tracks changes in files over time.
- Git is a tool — a specific program that implements version control.

What does Version Control do?

It keeps **track of changes** in your files so you can:


- Go back to older versions
 - See what was changed
 - Collaborate with others
-

Example (Without Git)

Step 1: Create a text file

bash

```
echo "I love coding." > bio.txt
```

 Output (in bio.txt):


css

I love coding.

Step 2: Make a new version

bash

```
echo "I love coding and design." > bio-v2.txt
```

 Output (in bio-v2.txt):

css

I love coding and design.

Step 3: See what's different using diff

bash

```
diff -u bio.txt bio-v2.txt
```

✓ Output:

diff

```
--- bio.txt
```

```
+++ bio-v2.txt
```

```
@@
```

```
-I love coding.
```

```
+I love coding and design.
```

💬 This says:

- Line removed: I love coding.
- Line added: I love coding and design.

🔧 2. Using a Patch File

You can **save the diff** as a patch:

bash

```
diff -u bio.txt bio-v2.txt > update.patch
```

✓ Content of update.patch:

diff

```
--- bio.txt
```

```
+++ bio-v2.txt
```

```
@@
```

```
-I love coding.
```

```
+I love coding and design.
```

Now, you can apply it!

NOTE: If you want to go the other way, just swap the order:

diff -u bio-v2.txt bio.txt > update.patch

Step 4: Apply Patch

bash

patch bio.txt < update.patch (you can name any thing – change.diff)

✓ bio.txt is now updated automatically:

css

I love coding and design.

Real-World Git Example

Let's do the **same thing in Git** (version control tool).

Step 1: Setup Git Repo

bash

```
mkdir myproject
```

```
cd myproject
```

```
git init
```

Step 2: Add a file

bash

```
echo "I love coding." > bio.txt
```

```
git add bio.txt
```

```
git commit -m "v1: basic bio"
```

Step 3: Change the file

bash

```
echo "I love coding and design." > bio.txt
```

Step 4: View the diff

bash

```
git diff
```

Output:

diff

```
diff --git a/bio.txt b/bio.txt
```

index 5d41402..e99a18c 100644

--- a/bio.txt

+++ b/bio.txt

@@

-I love coding.

+I love coding and design.

Step 5: Save and Apply Patch

bash

git diff > change.patch

git apply change.patch

This will apply the same change again (if you reset or had a copy of the old version).
