Got you — you want **two things**:

**How to set up an application server in Ubuntu** (and understand the steps/parameters).
**How to create a Tomcat service file** so you can start it using:

```
sudo systemctl start tomcat
```

# ☑ PART 1 — Install and Set Up Apache Tomcat on Ubuntu (Step by Step, Explained)

## Step 1: Install Java

Tomcat requires Java.

```
sudo apt update
sudo apt install openjdk-17-jdk -y
```

### What these mean

`openjdk-17-jdk` = Java Development Kit, required for Tomcat to run.
`-y` = auto-approve installation.

Verify:

```
java -version
```

## Step 2: Create a Tomcat User

Good practice: run Tomcat under its own user (not root).

```
sudo useradd -M -s /bin/false tomcat
```

### Parameters:

`-M` → do **not** create a home directory
`-s /bin/false` → user cannot log in
This user is only used to *run* Tomcat safely.

## Step 3: Download Tomcat

```
cd /tmp
curl -O https://downloads.apache.org/tomcat/tomcat-9/v9.0.86/bin/apache-tomcat-9.0.86.tar.gz
```

### Explanation:

`curl -O` downloads the file using the original filename.

## Step 4: Install Tomcat into /opt

```
sudo mkdir -p /opt/tomcat
sudo tar xzvf apache-tomcat-9.0.86.tar.gz -C /opt/tomcat --strip-components=1
```

### Parameters explained:

`-C /opt/tomcat` → extract into this folder
`--strip-components=1` → remove the top folder from the archive so files go directly into `/opt/tomcat`

## Step 5: Fix permissions

```
sudo chown -R tomcat:tomcat /opt/tomcat
```

Makes Tomcat user the owner of Tomcat folder.

# ☑ PART 2 — Create Tomcat Service File (systemd)

Create file:

```
sudo nano /etc/systemd/system/tomcat.service
```

Paste this **exact** service file:

```
[Unit]
Description=Apache Tomcat Application Server
After=network.target

[Service]
Type=forking

User=tomcat
Group=tomcat

Environment="JAVA_HOME=/usr/lib/jvm/java-17-openjdk-amd64"
Environment="CATALINA_HOME=/opt/tomcat"
Environment="CATALINA_BASE=/opt/tomcat"
Environment="CATALINA_PID=/opt/tomcat/temp/tomcat.pid"

ExecStart=/opt/tomcat/bin/startup.sh
ExecStop=/opt/tomcat/bin/shutdown.sh
```

```
Restart=on-failure

[Install]
WantedBy=multi-user.target
```

## 📝 Parameter Explanation (Very Important)

### [Unit]

`After=network.target`

→ start Tomcat *after* network is ready.

### [Service]

`Type=forking`

→ Tomcat runs in background, so systemd must expect a “fork”.

`User=tomcat` / `Group=tomcat`

→ Tomcat runs under this secure user.

`Environment=`
`JAVA_HOME` → path to Java
`CATALINA_HOME` → Tomcat installation folder
`CATALINA_BASE` → same folder (safe default)
`CATALINA_PID` → where Tomcat stores its process ID
`ExecStart=`

→ command systemd runs to start Tomcat

`ExecStop=`

→ command to stop Tomcat

`Restart=on-failure`

→ auto restart Tomcat if it crashes.

```
[Install]

     WantedBy=multi-user.target
```

→ allows systemctl enable/start

# ☑ PART 3 — Enable and Start Tomcat

After saving the file:

```
sudo systemctl daemon-reload
sudo systemctl enable tomcat
sudo systemctl start tomcat
```

Check status:

```
sudo systemctl status tomcat
```

If Tomcat is running, you should see **active (running)**.

# ☑ PART 4 — Test Tomcat

Open browser:

http://YOUR_SERVER_IP:8080

or

```
curl http://localhost:8080
```

# 🎉 DONE!

You have:

✓ Installed Tomcat

✓ Learned why each step matters

✓ Created a proper systemd service

✓ Can start/stop Tomcat like any other Linux service

```
sudo systemctl start tomcat
sudo systemctl stop tomcat
sudo systemctl restart tomcat
```

If you want next:

- How to deploy WAR files
- How to connect Apache2 as a reverse proxy
- How to enable HTTPS with SSL
- How to secure Tomcat manager

Just tell me — I can give step-by-step for each.