

---

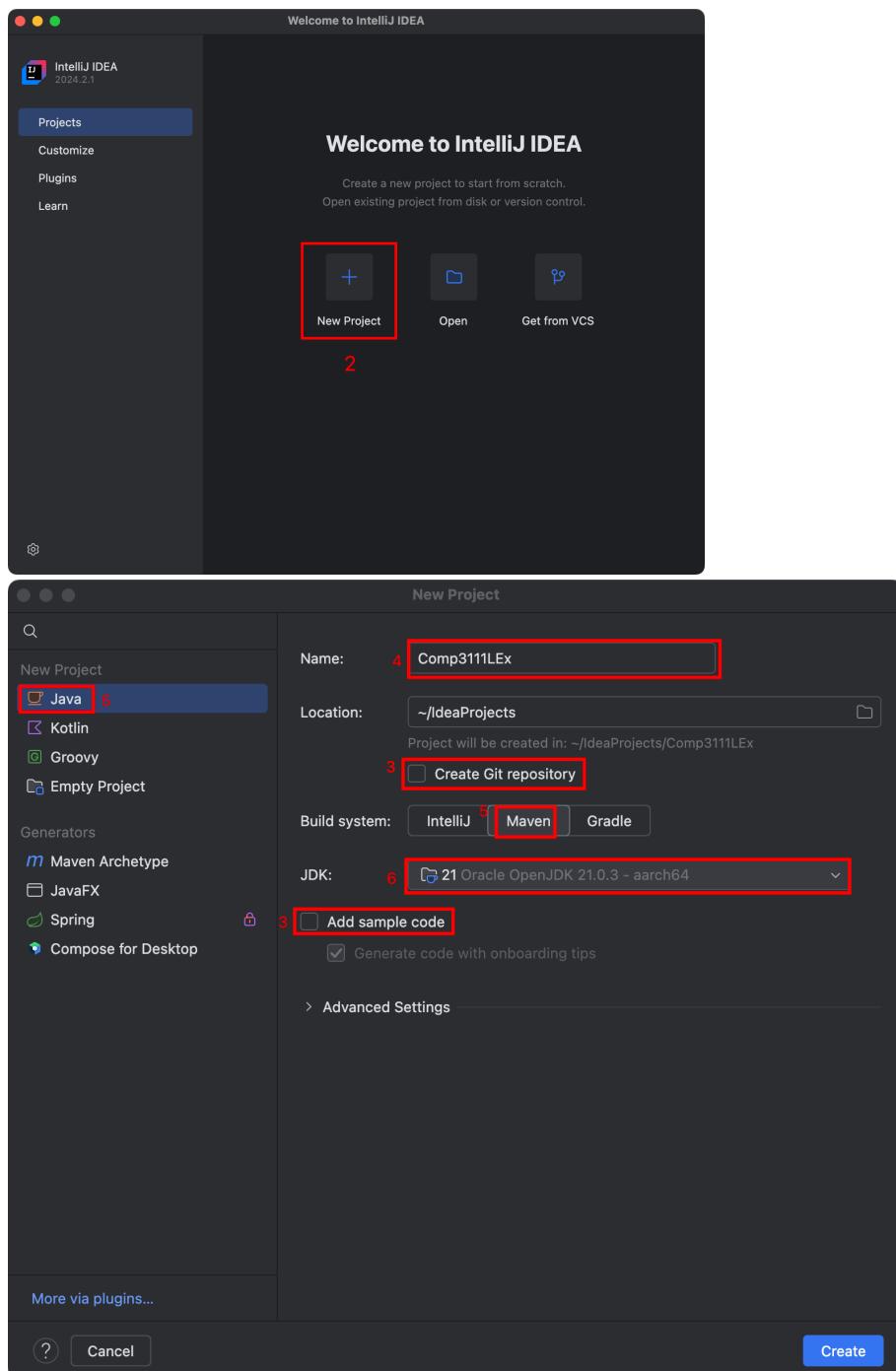
# Appendices

## Screenshots for Lab1

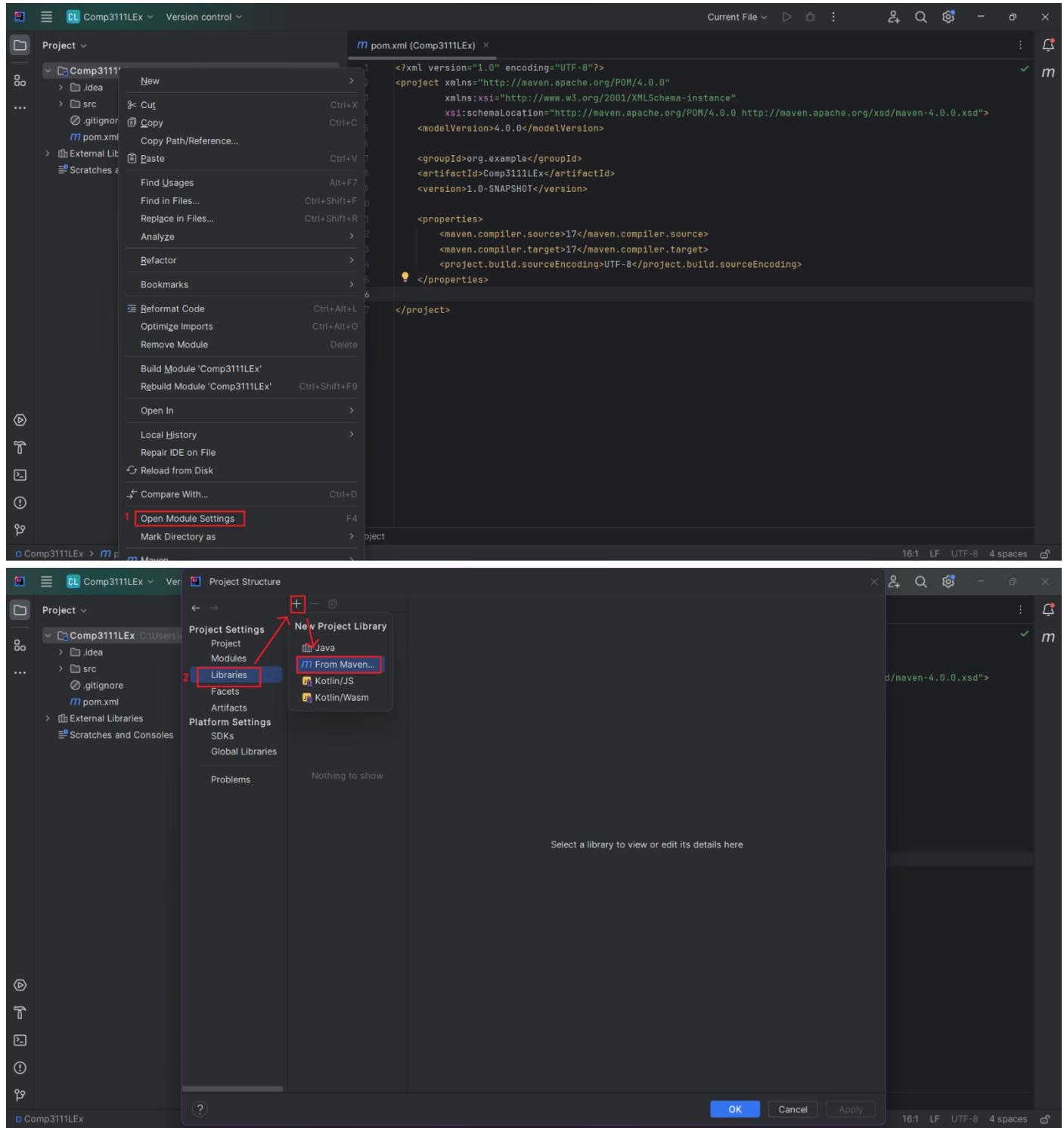
<b>Exercise 1: Create a Java Project in IntelliJ.....</b>	<b>2</b>
Step 1.1      Use Maven to build a new project.....	2
Step 1.2      Configuration of Junit.....	3
Step 1.3      Write application code .....	9
<b>Exercise 2: Set up a local Git repository for the Java Project.....</b>	<b>13</b>
Step 2.1      Put the existing Java Project under VCS.....	13
Step 2.2      Git Operation – Committing Changes .....	15
Step 2.3      Git Opeartion – Push commit(s) to a remote repository.....	18
<b>Exercise 3: Set up a remote Git repository on GitHub for collaborative team work.....</b>	<b>21</b>
Step 3.2:      Create your personal GitHub account .....	21
<b>LAB ASSIGNMENT .....</b>	<b>26</b>

# Exercise 1: Create a Java Project in IntelliJ

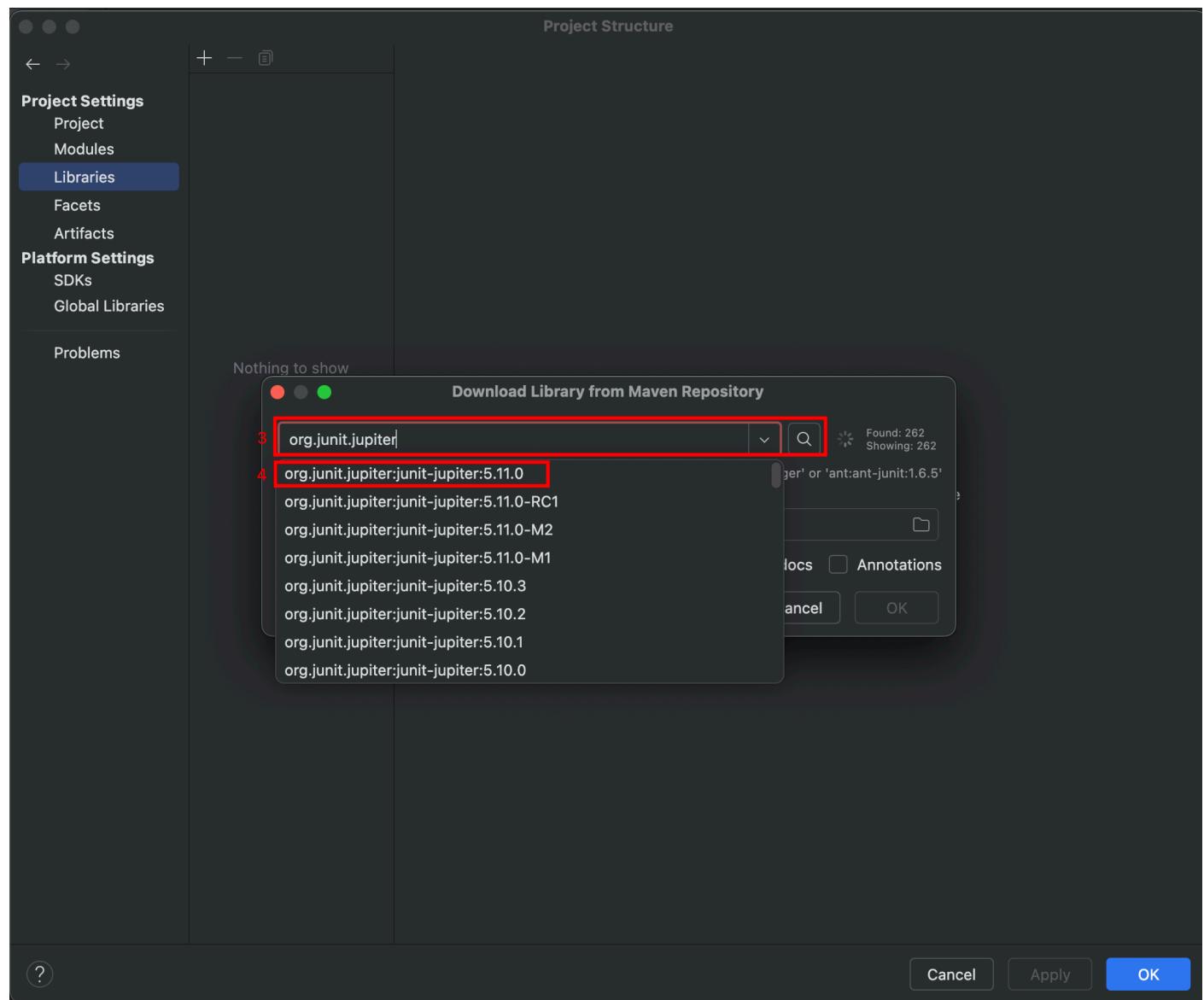
## Step 1.1 Use Maven to build a new project



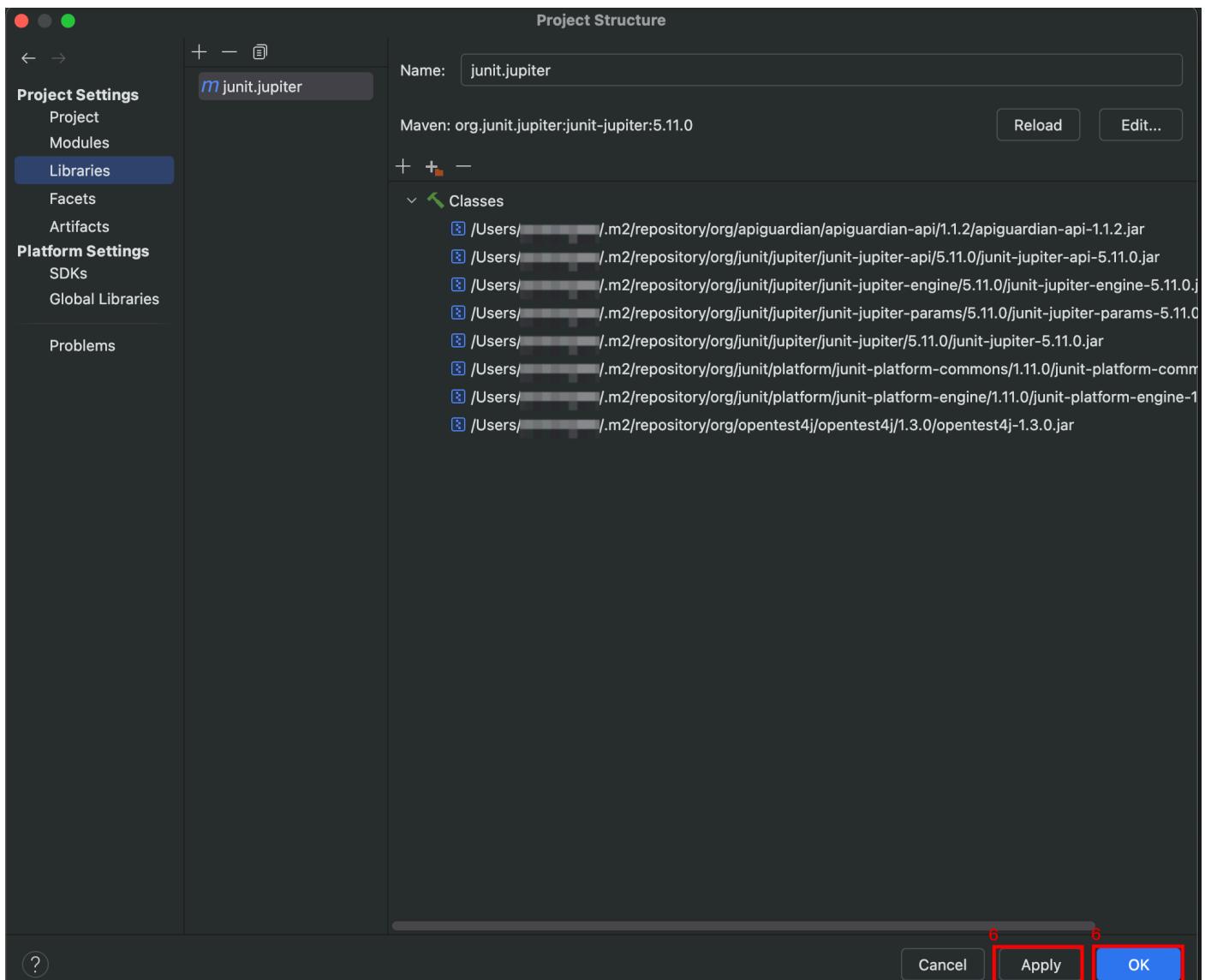
## Step 1.2 Configuration of Junit



## Step 1.2 Configuration of Junit (cont...)



## Step 1.2 Configuration of Junit (cont...)



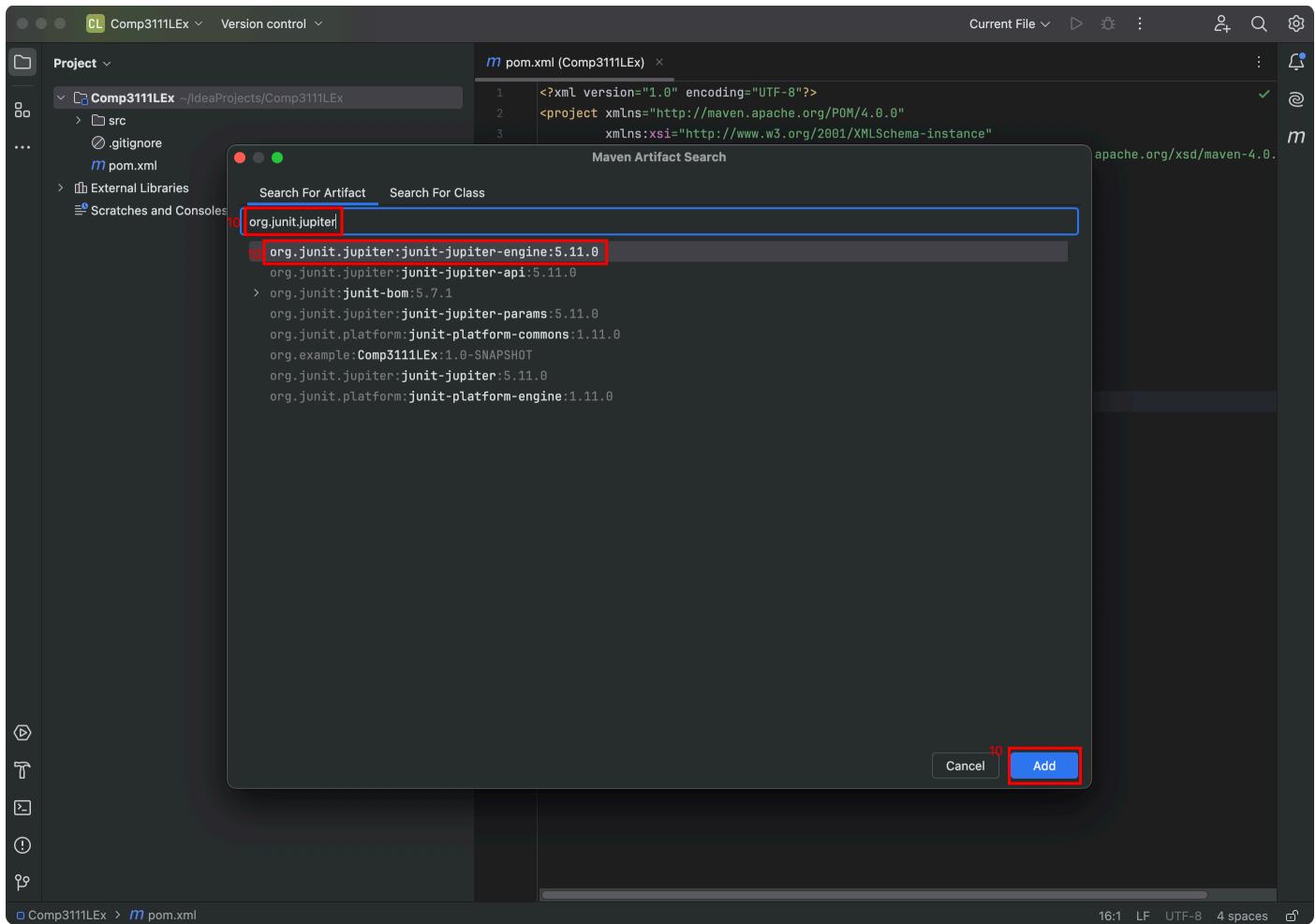
## Step 1.2 Configuration of Junit (cont...)

The screenshot shows the IntelliJ IDEA interface with the project 'Comp3111LEX' open. The left sidebar displays the project structure, including .idea, libraries, .gitignore, src (with main and resources), test, and .gitignore. The pom.xml file is selected in the editor, and its content is visible:

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
          xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
          xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>
    <groupId>org.example</groupId>
    <artifactId>Comp3111LEX</artifactId>
    <version>1.0-SNAPSHOT</version>
    <properties>
        <maven.compiler.source>21</maven.compiler.source>
        <maven.compiler.target>21</maven.compiler.target>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
    </properties>
</project>
```

A context menu is open over the pom.xml file, listing options such as Paste, Copy / Paste Special, Column Selection Mode, Go To, Folding, Analyze, Refactor, Generate..., Open In, Validate, Local History, Compare with Clipboard, Generate DTD from XML File, and Maven. The 'Generate...' option is highlighted with a red box.

## Step 1.2 Configuration of Junit (cont...)



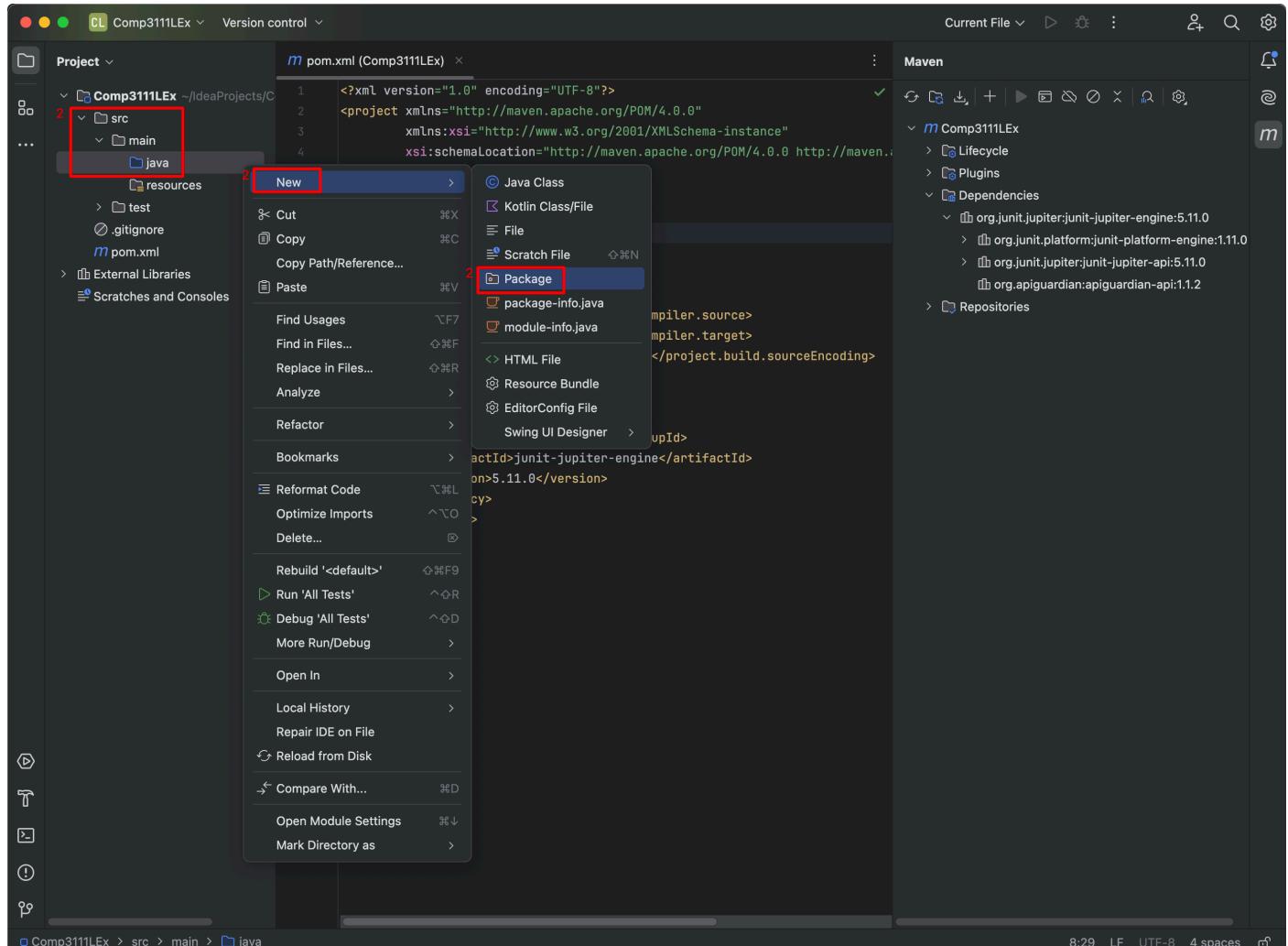
## Step 1.2 Configuration of Junit (cont...)

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project View:** Shows the project structure with a red box around the `pom.xml` file.
- Maven Tool Window:** Shows the Maven project tree with a red box around the `Dependencies` section. It lists the following dependencies:
  - org.junit.jupiter:junit-jupiter-engine:5.11.0
  - org.junit.platform:junit-platform-engine:1.11.0
  - org.junit.jupiter:junit-jupiter-api:5.11.0
  - org.apiguardian:apiguardian-api:1.1.2
- Code Editor:** Shows the `pom.xml` file with the following XML code. A red box highlights the `<dependencies>` section, which contains the dependency for JUnit Jupiter.

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
          xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
          xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>
    <groupId>org.example</groupId>
    <artifactId>Comp3111LEx</artifactId>
    <version>1.0-SNAPSHOT</version>
    <properties>
        <maven.compiler.source>21</maven.compiler.source>
        <maven.compiler.target>21</maven.compiler.target>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
    </properties>
    <dependencies>
        <dependency>
            <groupId>org.junit.jupiter</groupId>
            <artifactId>junit-jupiter-engine</artifactId>
            <version>5.11.0</version>
        </dependency>
    </dependencies>
</project>
```

## Step 1.3 Write application code



You may copy/type below codes for two Java Classes in Lab1 exercise:

[myLibrary] 5

package Lab1;

```
/* Comp3111LEx\Lab1\myLibrary.java
 my Java library consists of 2 mathematical functions */
```

```
public class myLibrary {
```

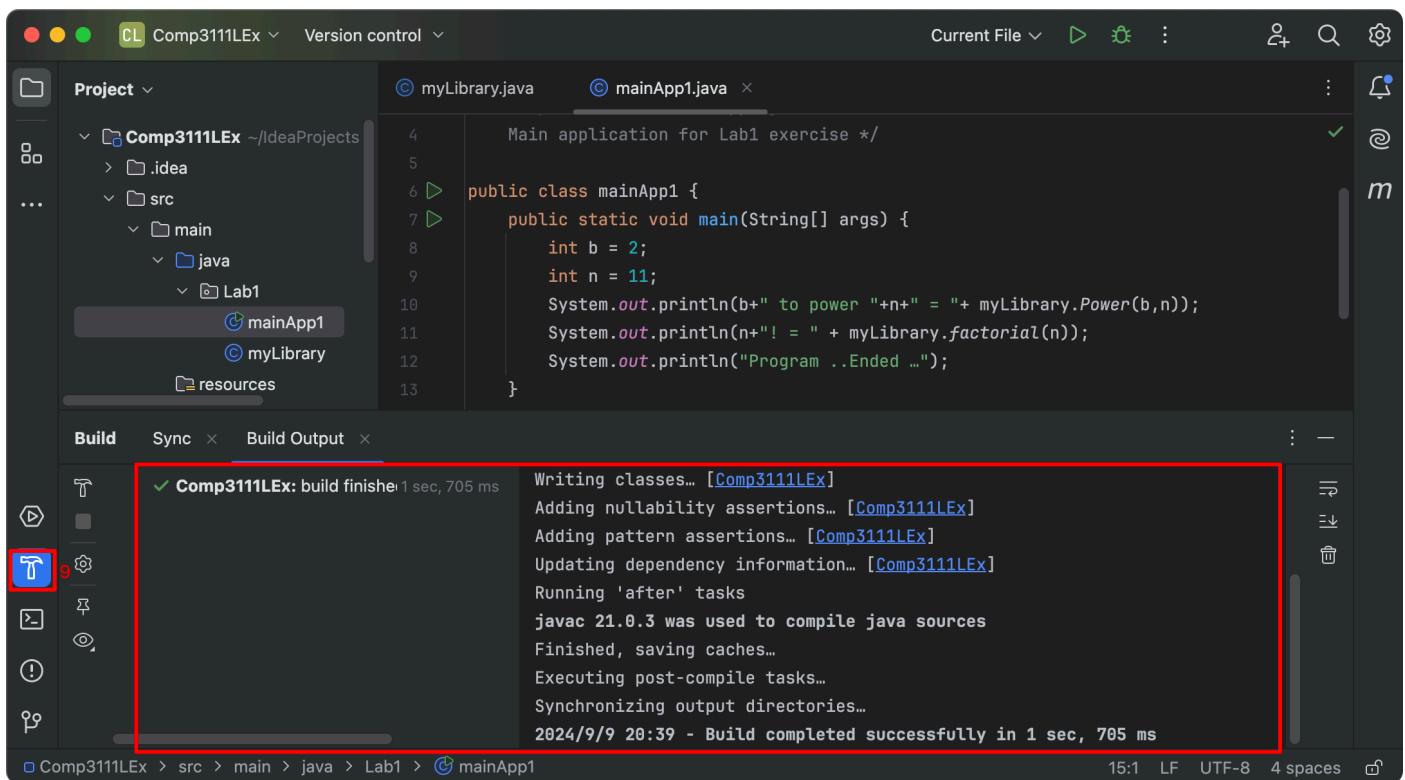
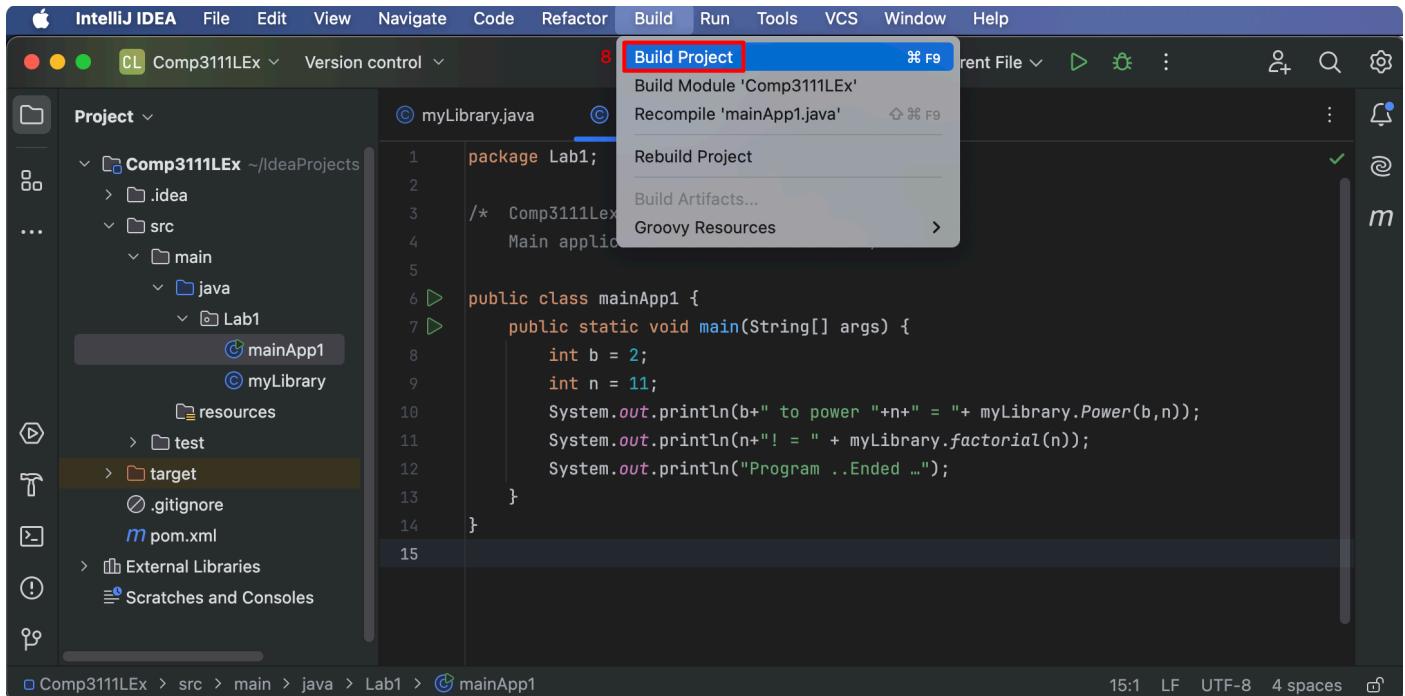
```
public static int Power(int Base, int Exponent){  
    if (Exponent==1){  
        return Base * Exponent;  
    } else{  
        return Base * Power(Base, Exponent - 1);  
    }  
}
```

```
public static int factorial(int n){  
    if (n==1){  
        return 1;  
    } else{  
        return n * factorial(n-1);  
    }  
}
```

[mainApp1] 6

```
package Lab1;  
  
/* Comp3111Lex\Lab1\mainApp1.java  
Main application for Lab1 exercise */  
  
public class mainApp1 {  
    public static void main(String[] args) {  
        int b = 2;  
        int n = 11;  
        System.out.println(b+" to power "+n+" = "+ myLibrary.Power(b,n));  
        System.out.println(n+"! = " + myLibrary.factorial(n));  
        System.out.println("Program ..Ended ...");  
    }  
}
```

### Step 1.3 Write application code (cont...)



### Step 1.3 Write application code (cont...)

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project View:** Shows the project structure under "Comp3111LEx".
- Code Editor:** The file "mainApp1.java" is open, containing the following code:
 

```
public class mainApp1 {
    public static void main(String[] args) {
        System.out.println(b+" to power "+n+" = "+ myLibrary.Power(b,n));
        System.out.println(n+"! = " + myLibrary.factorial(n));
        System.out.println("Program ..Ended ...");
    }
}
```
- Run Output:** The "Run" tool window shows the execution results:
 

```
/Library/Java/JavaVirtualMachines/jdk-21.jdk/Contents/Home/bin/java -javaagent:/Applications/IntelliJ IDEA CE.app/Contents
2 to power 11 = 2048
11! = 39916800
Program ..Ended ...

Process finished with exit code 0
```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project View:** Shows the project structure under "Comp3111LEx".
- Code Editor:** The file "myLibrary.java" is open, containing the following code:
 

```
/*
 * Comp3111LEx\Lab1\myLibrary.java
 * my Java library consists of 2 mathematical functions */

public class myLibrary {
    public static int Power(int Base, int Exponent){
        if (Exponent==1){
            return Base * Exponent;
        } else{
            return Base * Power(Base, Exponent- 1);
        }
    }

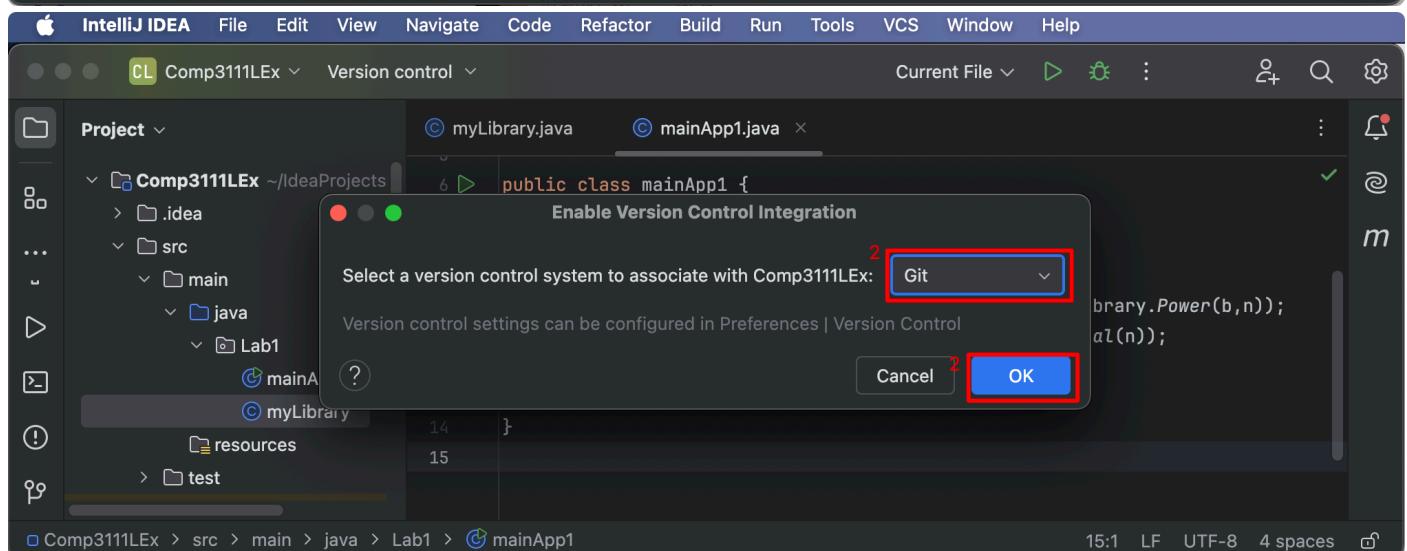
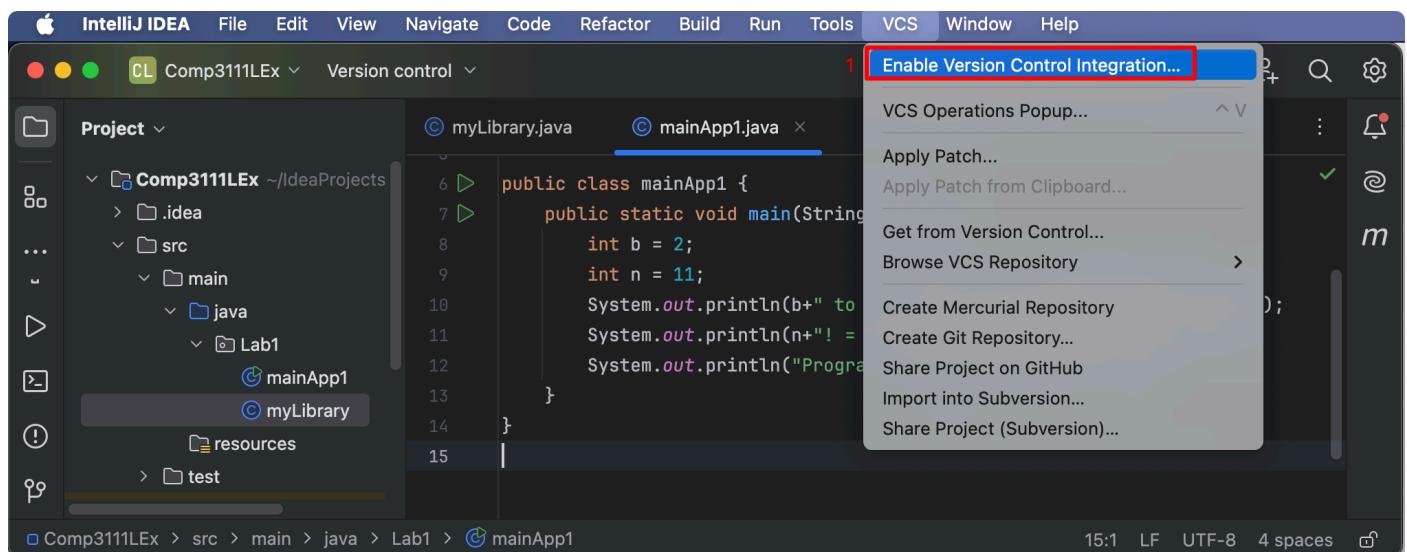
    public static int factorial(int n){
        ...
    }
}
```
- Build Output:** The "Build" tool window shows the build errors:
 

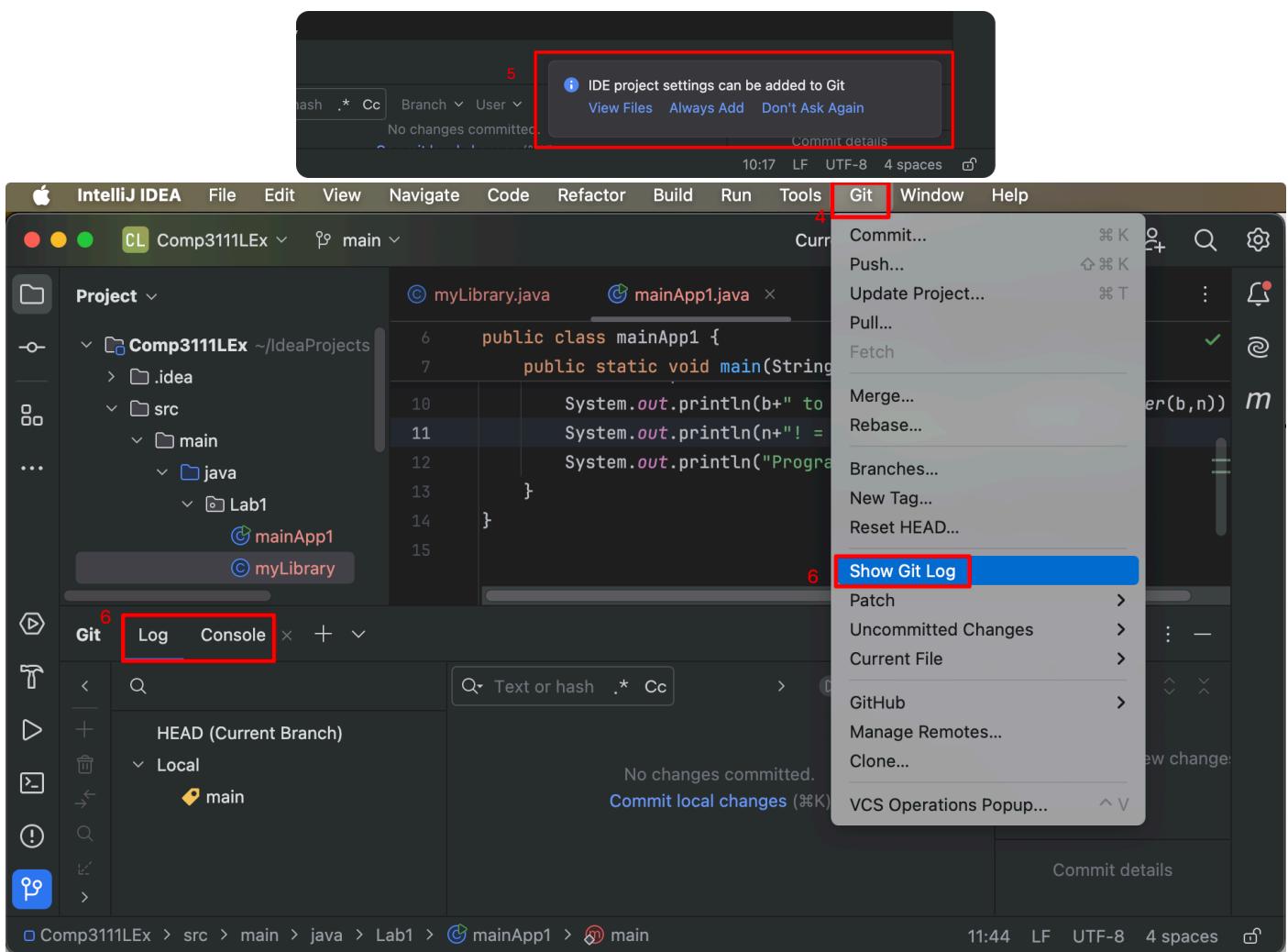
```
Comp3111LEx: build failed At 2024/546 ms
myLibrary.java src/main/java/Lab1 2 errors
    not a statement :10
    ';' expected :10
```

## Exercise 2: Set up a local Git repository for the Java Project

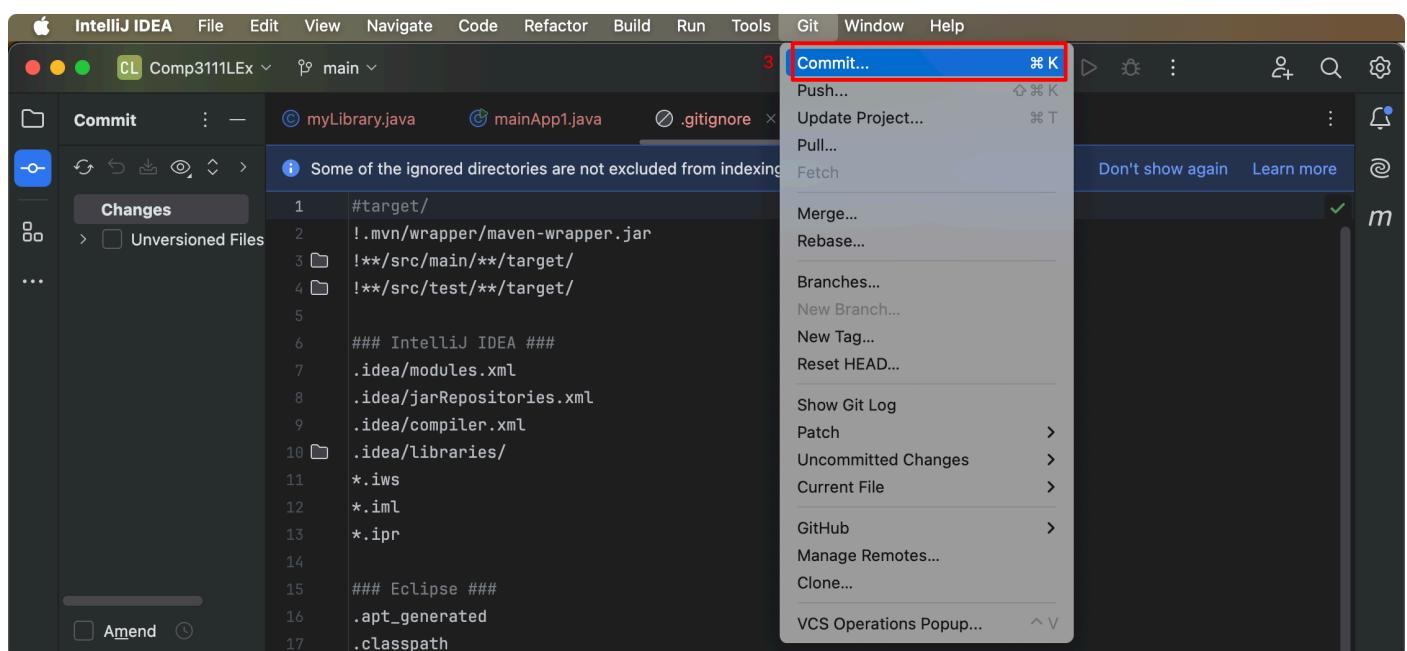
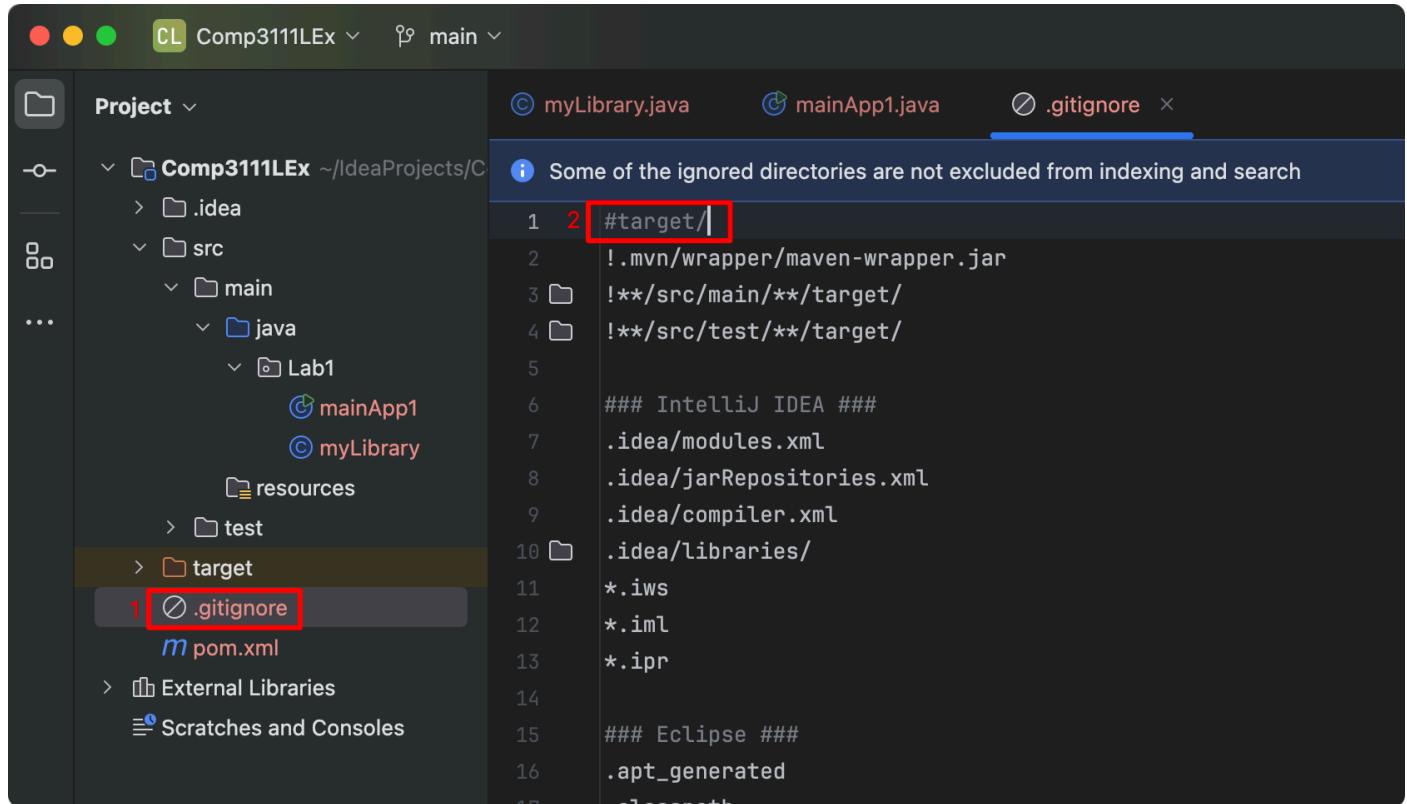
### Project

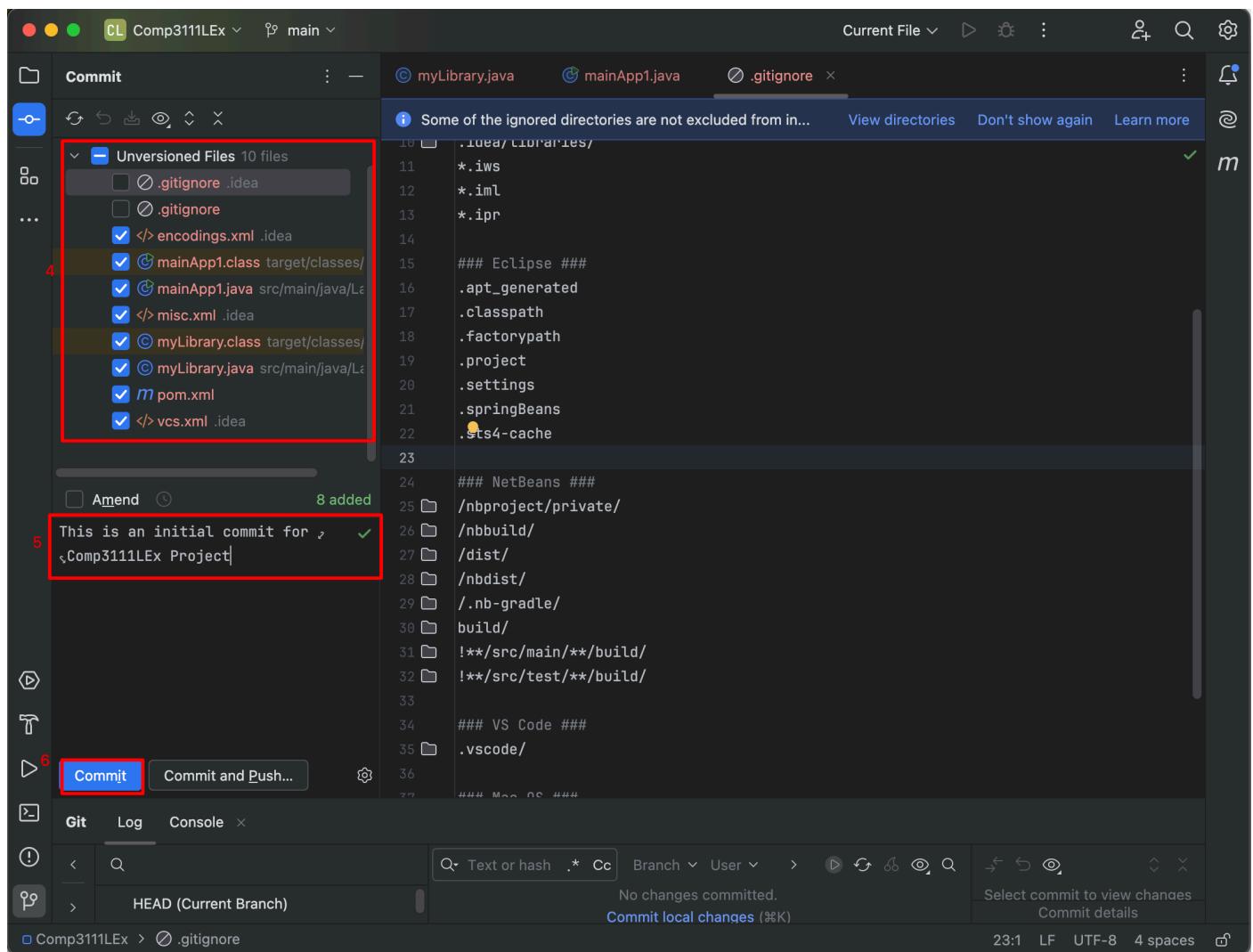
#### Step 2.1 Put the existing Java Project under VCS





## Step 2.2 Git Operation – Committing Changes





The screenshot shows a Java IDE interface with the following details:

- Top Bar:** Shows the project name "Comp3111LEX" and file path "main".
- Left Sidebar:** Contains icons for file operations like Open, Save, Undo, Redo, and a search bar.
- Commit Panel (8):** Shows a commit message: "Add 2 print lines as report heading". This message is highlighted with a red box.
- Code Editor (myLibrary.java):** Displays Java code for a library. A specific line of code is highlighted with a red box:

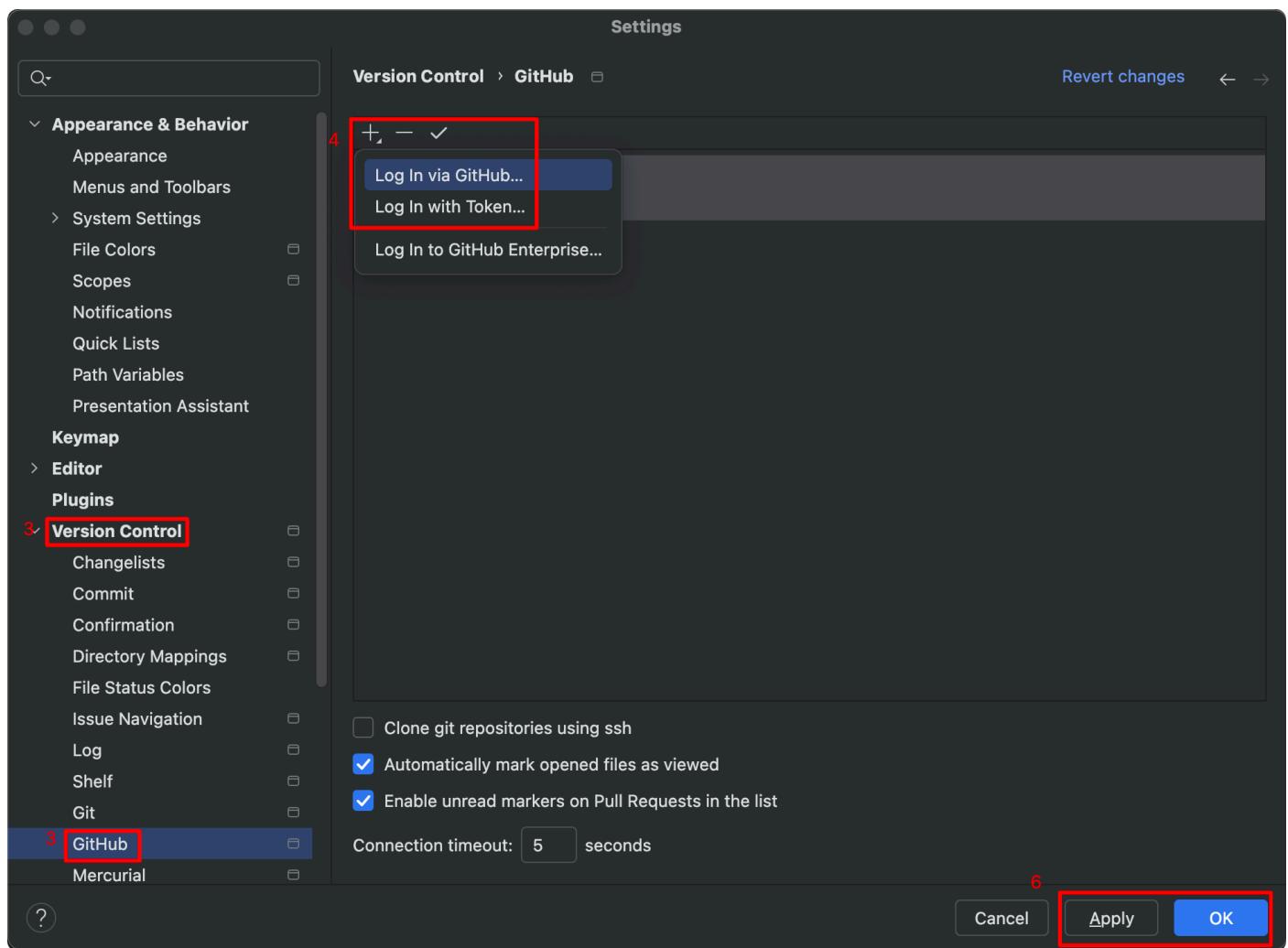
```
System.out.println("Program ..Starting...");
```
- Code Editor (mainApp1.java):** Displays Java code for the main application. It includes imports for myLibrary and prints values for b and n.
- Log Panel (9):** Shows the commit history. The most recent commit is highlighted with a red box:

Add 2 print lines as report heading (main) Moments ago  
This is an initial commit for Comp3111LEX Project 5 minutes ago
- Bottom Status Bar:** Shows the time as 17:1, file type as LF, encoding as UTF-8, and indentation as 4 spaces.

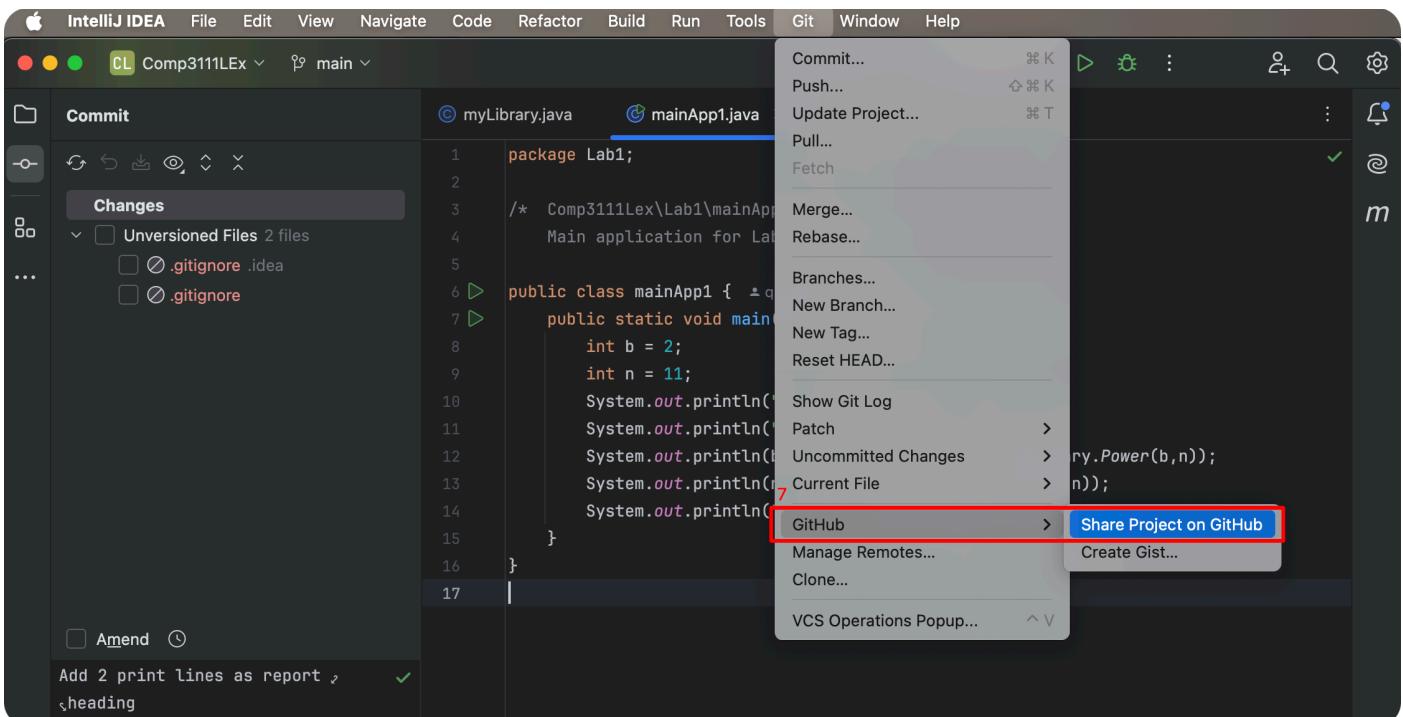
## Step 2.3 Git Opeartion – Push commit(s) to a remote repository

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project Bar:** Comp3111LEx, main
- Commit Dialog:** Shows a list of changes, including "Unversioned Files" and ".gitignore" files.
- Code Editor:** Displays Java code for `mainApp1.java`, which includes imports from `myLibrary` and a main method that prints values to `System.out`.
- Context Menu (Top Right):** A red box highlights the "Settings..." option in the menu, which is also labeled with a circled "1". Other options include "Run Anything...", "Project Structure...", "Plugins...", "Settings Sync... Off", "Theme...", "Keymap...", and "View Mode...".



### Step 2.3 Git Opeartion – Push commit(s) to a remote repository (cont ...)



The screenshot shows a GitHub repository page for 'Comp3111LEx'. The commit history is displayed, showing four commits from user 'qhjhc'. The first commit is 'Add 2 print lines as report heading'. The other three commits are for files in the '.idea' folder, which are described as initial commits for the project. The right sidebar shows repository statistics: 1 branch, 0 tags, 1 watching, 0 forks, and 0 stars. It also includes sections for 'About', 'Releases', and 'Packages'.

Commit	Description	Time
qhjhc Add 2 print lines as report heading	This is an initial commit for Comp3111LEx Project	3019c18 - 17 minutes ago
.idea/.idea	Add 2 print lines as report heading	21 minutes ago
.idea/src/main/java/Lab1	This is an initial commit for Comp3111LEx Project	21 minutes ago
.idea/target/classes/Lab1	This is an initial commit for Comp3111LEx Project	21 minutes ago
.idea/pom.xml	This is an initial commit for Comp3111LEx Project	21 minutes ago

# Exercise 3: Set up a remote Git repository on GitHub for collaborative team work

## Step 3.2: Create your personal GitHub account

The screenshot shows two side-by-side web pages. On the left, the GitHub Global Campus landing page for students is displayed. It features a large button labeled 'Sign up for Global Campus' with a yellow '1' icon. On the right, the GitHub sign-in page is shown, with a yellow '2' icon pointing to the input field where the email 'csalan@ust.hk' is entered.

**LAB-1 | Exercise-3 | Step 3.2**

**GitHub.com**

**Education**

**STUDENT**

## With GitHub Global Campus, your work will speak for itself.

Build your portfolio, grow your network, and level up your skills.

**1** Sign up for Global Campus

**Student Developer Pack**  
There's no substitute for hands-on experience, but for most students, real-world tools can be cost prohibitive. That's why we created the Pack with some of our partners and friends, like:

**Campus Expert**  
Build the tech community at your school with training and support from GitHub.

**GitHub Octerntships**  
Join a pool of talented GitHub Octernts to access paid industry experience and mentorship opportunities that will boost your career. We connect you with partners such as:

**2** csalan@ust.hk

Username or email address

Password [Forgot password?](#)

**Sign in**

New to GitHub? [Create an account.](#)

Terms Privacy Security Contact GitHub

Home / Benefits / Benefits application

## Get your GitHub benefits

Learn and teach using real-world developer tools

Select the academic status \*

Teacher  Student

Benefits for Students

-  STUDENT  
FREE GitHub Pro while you are a student
-  STUDENT  
Valuable GitHub Student Developer Pack partner offers
-  STUDENT  
GitHub Campus Expert training for qualified applicants

What is the name of your school? \*

Note: Selecting a school-issued email address gives you the best chance of a speedy review.

csalan@ust.hk **The Hong Kong University of Science and Technology**

alan.chanab@gmail.com

+ Add an email address

We require students using ust.hk school-issued email to send additional proof of academic status.

Your request will be processed faster and have a greater chance to be approved if you use one of the following school-issued email address(es) instead:  
- connect.ust.hk

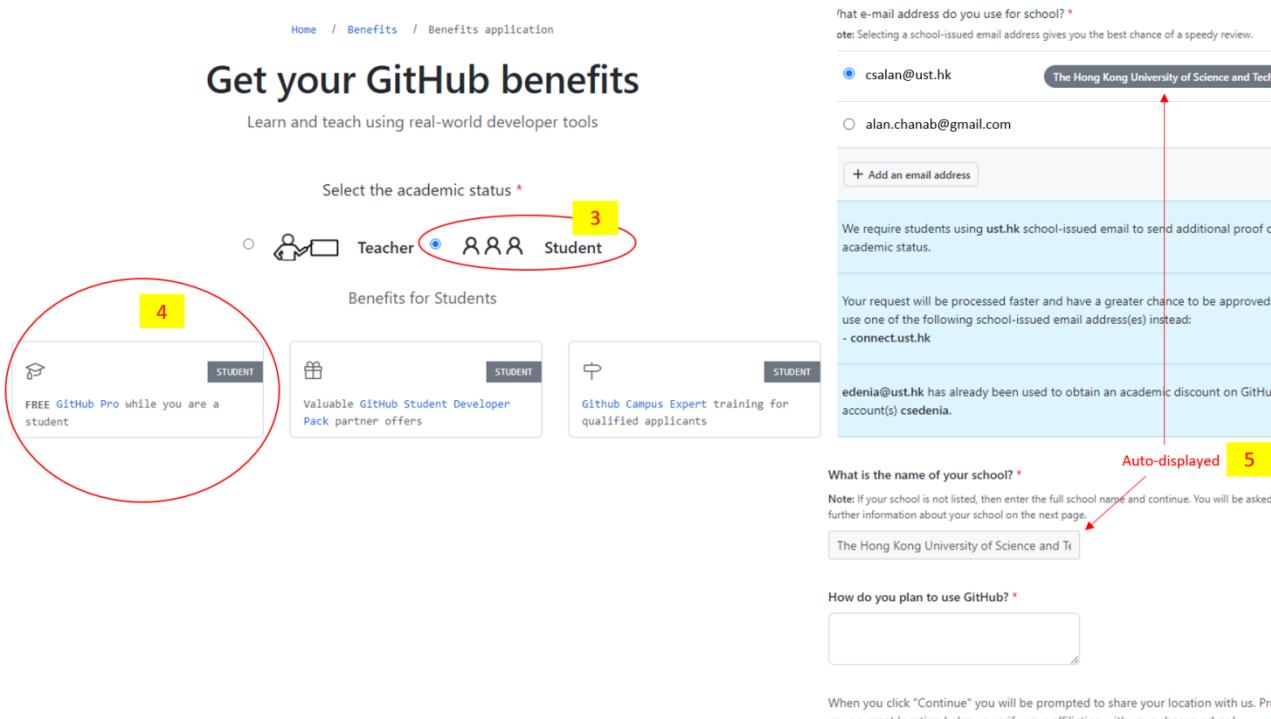
edenia@ust.hk has already been used to obtain an academic discount on GitHub account(s) csedenia.

Auto-displayed **5**

How do you plan to use GitHub? \*

When you click "Continue" you will be prompted to share your location with us. Providing your current location helps us verify your affiliation with your chosen school.

Continue



### Step 3.3: Generate a GitHub Tokens

The screenshot shows the GitHub user profile page for 'csedenia'. A red arrow points from the top right corner of the profile picture area to a yellow box labeled '1' on the user dropdown menu. Another red arrow points from the 'Developer settings' link in the sidebar to a yellow box labeled '2' on the same link.

**LAB-1 | Exercise-3 | Step 3.3**

**csedenia**

Overview    Repositories 15    Projects    Packages    Stars

Saved replies

- Security
- Code security and analysis
- Integrations
- Applications
- Scheduled reminders

Archives

- Security log
- Sponsorship log

<> Developer settings **2**

You unlocked new Achievements with private contributions by including private contributions in your Profile

Popular repositories

- COMP311 (Public)
- vplusu (Public)  
Eden Vplusu Repository

csedenia Eden Wong

- Set status
- Your profile
- Your repositories
- Your projects
- Your codespaces
- Your stars
- Your sponsors
- Your gists

Try Enterprise

- Feature preview
- Settings **1**
- Github Docs
- Github Support

The screenshot shows the GitHub Developer Settings page under the Personal access tokens section. A red box highlights the 'Tokens (classic)' link, which is step 3. A red circle labeled '3' is placed over the 'Beta' button next to 'Fine-grained tokens'. Another red box highlights the 'Generate new token (classic)' button, which is step 4. A red circle labeled '4' is placed over the 'For general use' checkbox.

Personal access tokens (classic)

Generate new token (classic)

Generate new token (Beta)

For general use

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

166

167

168

169

170

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

187

188

189

190

191

192

193

194

195

196

197

198

199

200

201

202

203

204

205

206

207

208

209

210

211

212

213

214

215

216

217

218

219

220

221

222

223

224

225

226

227

228

229

230

231

232

233

234

235

236

237

238

239

240

241

242

243

244

245

246

247

248

249

250

251

252

253

254

255

256

257

258

259

260

261

262

263

264

265

266

267

268

269

270

271

272

273

274

275

276

277

278

279

280

281

282

283

284

285

286

287

288

289

290

291

292

293

294

295

296

297

298

299

300

301

302

303

304

305

306

307

308

309

310

311

312

313

314

315

316

317

318

319

320

321

322

323

324

325

326

327

328

329

330

331

332

333

334

335

336

337

338

339

340

341

342

343

344

345

346

347

348

349

350

351

352

353

354

355

356

357

358

359

360

361

362

363

364

365

366

367

368

369

370

371

372

373

374

375

376

377

378

379

380

381

382

383

384

385

386

387

388

389

390

391

392

393

394

395

396

397

398

399

400

401

402

403

404

405

406

407

408

409

410

411

412

413

414

415

416

417

418

419

420

421

422

423

424

425

426

427

428

429

430

431

432

433

434

435

436

437

438

439

440

441

442

443

444

445

446

447

448

449

450

451

452

453

454

455

456

457

458

459

460

461

462

463

464

465

466

467

468

469

470

471

472

473

474

475

476

477

478

479

480

481

482

483

484

485

486

487

488

489

490

491

492

493

494

495

496

497

498

499

500

501

502

503

504

505

506

507

508

509

510

511

512

513

514

515

516

517

518

519

520

521

522

523

524

525

526

527

528

529

530

531

532

533

534

535

536

537

538

539

540

541

542

543

544

545

546

547

548

549

550

551

552

553

554

555

556

557

558

559

560

561

562

563

564

565

566

567

568

569

570

571

572

573

574

575

576

577

578

579

580

581

582

583

584

585

586

587

588

589

590

591

592

593

594

595

596

597

598

599

600

601

602

603

604

605

606

607

608

609

610

611

612

613

614

615

616

617

618

619

620

621

622

623

624

625

626

627

628

629

630

631

632

633

634

635

636

637

638

639

640

641

642

643

644

645

646

647

648

649

650

651

652

653

654

655

656

657

658

659

660

661

662

663

664

665

666

667

668

669

670

671

672

673

674

675

676

677

678

679

680

681

682

683

684

685

686

687

688

689

690

691

692

693

694

695

696

697

698

699

700

701

702

703

704

705

706

707

708

709

710

711

712

713

714

715

716

717

718

719

720

721

722

723

724

725

726

727

728

729

730

731

732

733

734

735

736

737

738

739

740

741

742

743

744

745

746

747

748

749

750

751

752

753

754

755

756

757

758

759

760

761

762

763

764

765

766

767

768

769

770

771

772

773

774

775

776

777

778

779

780

781

782

783

784

785

786

787

788

789

790

791

792

793

794

795

796

797

798

799

800

801

802

803

804

805

806

807

808

809

810

811

812

813

814

815

816

817

818

819

820

821

822

823

824

825

826

827

828

829

830

831

832

833

834

835

836

837

838

839

840

841

842

843

844

845

846

847

848

849

850

851

852

853

854

855

856

857

858

859

860

861

862

863

864

865

866

867

868

869

870

871

872

873

874

875

876

877

878

879

880

881

882

883

884

885

886

887

888

889

890

891

892

893

894

895

896

897

898

899

900

901

902

903

904

905

906

907

908

909

910

911

912

913

914

915

916

917

918

919

920

921

922

923

924

925

926

927

928

929

930

931

932

933

934

935

936

937

938

939

940

941

942

943

944

945

946

947

948

949

950

951

952

953

954

955

956

957

958

959

960

961

962

963

964

965

966

967

968

969

970

971

972

973

974

975

976

977

978

979

980

981

982

983

984

985

986

987

988

989

990

991

992

993

994

995

996

997

998

999

1000

### Step 3.3: Generate a GitHub Tokens (cont ...)

LAB-1 | Exercise-3 | Step 3.3

The screenshot shows the GitHub 'Personal access tokens (classic)' generation interface. On the left, a note field (5) contains 'for Comp3111 Lab1'. An expiration date (6) is set to '31/12/2023'. Under 'Select scopes', the 'repo' checkbox (7) is selected, granting 'Full control of private repositories'. Other available scopes include 'repo:status', 'repo\_deployment', 'public\_repo', 'repo:invite', and 'security\_events'. A red arrow points from step 7 to the 'repo' scope. A red box highlights the generated token 'ghp\_Tyy5GlIPX0JkyTy5Zwv5NKOFSt0bev1Vsgox' (9), which is also copied to the clipboard icon. A red callout box with the text 'Copy this token string to a safe place immediately, because...' points to this area. A red arrow points from step 8 to the 'Generate token' button at the bottom of the modal.

New personal access token (classic)

Personal access tokens (classic) function like ordinary OAuth access tokens. They can be used instead of a password for Git over HTTPS, or can be used to authenticate to the API over Basic Authentication.

Note **5**  
for Comp3111 Lab1

What's this token for?

Expiration \* **6**  
Custom... 31/12/2023

Select scopes

Scopes define the access for personal tokens. [Read more about OAuth scopes](#)

repo **7** Full control of private repositories  
 repo:status Access commit status  
 repo\_deployment Access deployment status  
 public\_repo Access public repositories  
 repo:invite Access repository invitations  
 security\_events Read and write security events

Personal access tokens (classic) [Generate new token](#) [Revoke all](#)

Tokens you have generated that can be used to access the GitHub API.

Make sure to copy your personal access token now. You won't be able to see it again!

ghp\_Tyy5GlIPX0JkyTy5Zwv5NKOFSt0bev1Vsgox **9** [Delete](#)

Copy this token string to a safe place immediately, because...

admin:ssh\_signing\_key Full control of public user SSH signing keys  
 write:ssh\_signing\_key Write public user SSH signing keys  
 read:ssh\_signing\_key Read public user SSH signing keys

**Generate token** [Cancel](#)

# LAB ASSIGNMENT

## LAB-1 | Lab Assignment

The screenshot shows the IntelliJ IDEA interface with the following elements:

- Project View:** On the left, the project structure for "Comp3111LEX" is shown. It includes a ".idea" folder, a "src" directory containing "main" and "java" sub-directories, and a "Lab1" package with files "mainApp1.java" and "myLibrary.java". A yellow box labeled "4a" highlights the "Lab1" package.
- Code Editor:** The main window displays the decompiled code of "mainApp1.class". A red box highlights the package declaration and the main method. A yellow box labeled "4b" highlights the main method body.
- Git Log:** At the bottom, the Git log shows the following commits:
  - Add 3rd print line (origin & master, Eden 15/6/2023 6:00 pm)
  - Add 2 print lines as report heading (Eden 15/6/2023 5:58 pm) - This is the selected commit, highlighted with a yellow box labeled "4c".
  - Add 2 print lines as report heading (Eden 15/6/2023 4:15 pm)
  - This is an initial commit for Comp3111LEX Project (Eden 15/6/2023 3:45 pm)A red box highlights the commit message "Add 2 print lines as report heading".
- Bottom Status Bar:** Shows "Revert was performed with conflicts: a8f3abef Add 2 print lines as report heading // There are unresolved conflicts in the working ... (a minute ago)"

