

## Lab 9:

### Programming Fundamentals (CS-130-02)

CS 130-02 FA 2022

Total=100

Open Eclipse IDE and create a new class for each of the following questions: Choose class name that most appropriately defining the problem. Take a print screen of the code with console output.

#### Question 1.

##### Student

-name: String  
-age: int  
-major: String  
-hobby: String  
-expected\_GPA: double  
-spent\_time\_learn\_JAVA: int

+Student()  
+Student(String name, int age, String major, String hobby, double expected\_GPA, int ..JAVA)  
+HonorsEligible():String

1. Implement the Student UML diagram with the above inputs
2. Create proper constructor and access all the private elements using getter and setter
3. Create a new method called HonorsEligible. If the student expected\_GPA is more than 3.5, the student eligible for honors (True) else it will return False.

The screenshot shows the Eclipse IDE interface. The Package Explorer on the left shows the project structure: CS130class > src > Lab9 > Student.java. The main editor window displays the code for Student.java. The code includes a class definition with private attributes (name, age, major, hobby, expected\_GPA, time\_learning\_java) and methods (setMajor, setHobby, setJava, main, and HonorsEligible). The main method creates a Student object and prints its details. The console output at the bottom shows the execution results, including the Student Info and the output of the HonorsEligible method.

```
45 }
46 public void setMajor(String major) {
47     this.major=major;
48 }
49 public void setHobby(String hobby) {
50     this.hobby=hobby;
51 }
52 public void setJava(int time_learning_java) {
53     this.time_learning_java=time_learning_java;
54 }
55
56
57 public static void main(String[] args) {
58     Student myfirstStudent = new Student("Tyler",19,"CS","Video Game Development",3.9,12);
59
60     System.out.println("Student Info:\nName: " + myfirstStudent.name+ "\nAge: " + myfirstStudent.age + "\nMajor: " +
61     myfirstStudent.major+ "\nHobby: " + myfirstStudent.hobby+ "\nJava: " + myfirstStudent.time_learning_java);
62
63     myfirstStudent.setName("Gibbie");
64 }
```

Console Output:

```
<terminated> Student [Java Application] C:\Users\tyler\p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64.17.0.5.v20221102-0933\jre\bin\javaw.exe (Nov 3, 2022, 11:02:49 AM - 11:02:50 AM)
Student Info:
Name: Tyler
Age: 19
Major: CS
Hobby: Video Game Development
Java: 12
Name: Gibbie
```

## Question 2.

Class	Attribute	Method
Cylinder	-radius:double - height:double	+AreaCylinder():double +VolumeCylinder():double

1. Create Cylinder constructor, calculate area and perimeter of the cylinder for radius 10, height 5

The screenshot shows the Eclipse IDE with the following components:

- Package Explorer:** Shows the project structure with 'CS130class' containing 'src' and 'Lab9'. 'Lab9' contains 'Cylinder.java', 'Student.java', 'studentapp.java', and 'module-info.java'.
- Editor:** Displays the code for 'Cylinder.java' and 'Student.java'.
  - Cylinder.java:**

```
22 public void setHeight(double height) {  
23     this.height=height;  
24 }  
25  
26 public double Area() {  
27     double area = radius*height;  
28     return area;  
29 }  
30 public double Peri() {  
31     double peri = ((2*radius)*2) + (2*height);  
32     return peri;  
33 }
```
  - Student.java:**

```
29 public String getHobby() {  
30     return hobby;  
31 }  
32 public double getGPA() {  
33     return expected_gpa;  
34 }  
35 public int getJava() {  
36     return time_learning_java;  
37 }  
38  
39
```
- Console:** Shows the output of the application:

```
<terminated> Cylinder [Java Application] C:\Users\tyler\p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64.17.0.5.v20221102-0933\jre\bin\javaw.exe (Nov 3, 2022, 11:18:06 AM - 11:18:06 AM)  
156.0  
74.0  
168.0  
76.0
```