Contents

[Student example 2](#_Toc352238481)

[Rectangle example 4](#_Toc352238482)

[Improved student example 6](#_Toc352238483)

[Further Improved student example 8](#_Toc352238484)

# Student example

**public** **class** Student {

**public** String name; // Student's name.

**public** **double** test1, test2, test3; // Grades on three tests.

**public** **double** getAverage() { // compute average test grade

**return** (test1 + test2 + test3) / 3;

}//getAverage

} // end of class Student

//uses Student.class also to create new instances of Student

**public** **class** StudentApplication {

**public** **static** **void** main(String[] args) {

Student s, s1, s2, s3; // declare Student variables

s = **new** Student(); /\* create a Student object and

store the reference to it in s \*/

s.name = "bob";

s.test1 = 10;

s.test2 = 20;

s.test3 = 30;

TextIO.*putln*("s name is " + s.name);

TextIO.*putln*("s test1 is " + s.test1);

TextIO.*putln*("s test2 is " + s.test2);

TextIO.*putln*("s test3 is " + s.test3);

TextIO.*putln*("s.getAverage() " + s.getAverage());

s2 = **new** Student();

}//main

}//class

# Rectangle example

**public** **class** Rectangle {

//instance variables - each instance of Rectangle get a copy!

**public** **int** height; // height of square

**public** **int** width; // width of square

**public** String colour; //colour of square???!!!

**public** **double** getArea() { // compute average test grade

**return** (height\*width);

}//getAverage

//member variable - belongs to class not each instance (uses static)

**public** **static** **int** *noOfRectangles* = 0;

}//class

**public** **class** RectangleApp {

**public** **static** **void** main (String[] args){

Rectangle blueRectangle = **new** Rectangle();

Rectangle.*noOfRectangles* ++ ;//increment no of Rectangles created

blueRectangle.colour = "blue";

blueRectangle.height = 5;

blueRectangle.width = 5;

Rectangle redRectangle = **new** Rectangle();

Rectangle.*noOfRectangles* ++ ; //increment no of Rectangles created

redRectangle.colour="red";

redRectangle.height = 15;

redRectangle.width = 15;

Rectangle greenRectangle = **new** Rectangle();

Rectangle.*noOfRectangles* ++ ;//increment no of Rectangles created

greenRectangle.colour="green";

greenRectangle.height = 35;

greenRectangle.width = 35;

TextIO.*putln* (blueRectangle.colour + " is " + blueRectangle.height + "cm X " + blueRectangle.width + "cm" );

TextIO.*putln* ("the area of " + blueRectangle.colour + " is " + (blueRectangle.height \* blueRectangle.width + "cm\u00B2" ) );

TextIO.*putln* (redRectangle.colour + " h = " + redRectangle.height + "cm, w = " + redRectangle.width + "cm" );

TextIO.*putln* (greenRectangle.colour + " h = " + greenRectangle.height + "cm, w = " + greenRectangle.width + "cm " );

TextIO.*putln*("total rectangles created = " + Rectangle.*noOfRectangles*);

//or

TextIO.*putln*("blueRectangle.getArea() is " + blueRectangle.getArea());

}

}

# Improved student example

**public** **class** StudentB {

**final** **private** String name; // Student’s name (fixed value)

**public** **double** test1, test2, test3; // Grades on three tests.

StudentB(String theName) { // Constructor for Student objects;

name = theName; // provides a name for the Student.(which is fixed as final)

}

**public** String getName() { // Getter method for reading the value of

**return** name; // the private instance variable, name.

}

**public** **double** getAverage() { // Compute average test grade.

**return** (test1 + test2 + test3) / 3;

}

} // end of class Student

**public** **class** StudentApplicationB {

**public** **static** **void** main(String[] args) {

StudentB s, s1, s2, s3; // declare Student variables

s = **new** StudentB("bob");

//TextIO.putln("s name is " + s.name); //can't access name directly now!!! uses constructor

TextIO.*putln*("s name is " + s.getName());

}//main

}//class

# Further Improved student example

**public** **class** StudentC {

**final** **private** String name; // Student’s name.

**private** **double** test1, test2, test3; // Grades on three tests.

StudentC(String theName) { // Constructor for Student objects;

name = theName; // provides a name for the Student.

}

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**public** String getName() { // Getter method for reading the value of

**return** name; // the private instance variable, name.

}

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**public** **double** getAverage() { // Compute average test grade.

**return** (test1 + test2 + test3) / 3;

}

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**public** **void** setTest1(**double** t1){ //setter method for setting test1

**if** ((t1<0) || (t1>100)) {

**throw** **new** IllegalArgumentException("test 1: 0 - 100");

}

**else**

test1 = t1;

}//setTest1

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**public** **double** getTest1(){

**return** test1;

}

} // end of class Student

**public** **class** StudentApplicationC {

**public** **static** **void** main(String[] args) {

StudentC s, s1, s2, s3; // declare Student variables

s = **new** StudentC("Rebecca"); //uses the constructor to create student with name

//TextIO.putln("s name is " + s.name); //can't access name directly now!!! uses constructor

TextIO.*putln*("enter test 1 result");

**double** result ;

result = TextIO.*getDouble*();

s.setTest1(result);

TextIO.*putln*("s.getTest1() is " + s.getTest1());

}//main

}//class