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# Example 1

Poorly designed as all are public.

**public** **class** StudentA {

**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;

}

} // end of class Student

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

**public** **class** StudentApplicationA {

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

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

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

store the reference to it in s \*/

TextIO.*putln*("s.test1 is " + s.test1); //test1 has been initialised

s1 = **new** StudentA(); // create a second Student object

s2 = s1; // std2 and std1 both refer to second Student

s3 = **null**; // store a null reference in std3

s.name = "John Smith";

s1.name = "Mary Jones";

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

s.test1 = 99;

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

}//main

}//class

# Example 2

**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.getName());

}//main

}//class

# Example 3

Well-designed class using private, a constructor and getters & setters

**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

# Example 4

Using a class variable

**public** **class** StudentA {

**public static int *numberOfStudents***; // class variable not member variable

**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;

}

} // end of class Student

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

**public** **class** StudentApplicationA {

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

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

s = **new** StudentA(); /\* create a Student object and store the reference to it in s \*/

TextIO.*putln*("s.test1 is " + s.test1); //test1 has been initialised

**StudentA.*numberOfStudents*=3;**

s1 = **new** StudentA(); // create a second Student object

s2 = s1; // std2 and std1 both refer to second Student

s3 = **null**; // store a null reference in std3

s.name = "John Smith";

s1.name = "Mary Jones";

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

s.test1 = 99;

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

}//main

}//class