

**public** **abstract** **class** UniPerson {

**private** String name;

**private** **int** age;

//setter and getters

**public** String getName() {

**return** name;

}

**public** **void** setName(String name) {

**this**.name = name;

}

**public** **int** getAge() {

**return** age;

}

**public** **void** setAge(**int** age) {

**this**.age = age;

}

**public** **abstract** **void** uniAtendee();

}

**public** **class** Student **extends** UniPerson **implements** SSN {

**private** **double** GPA;

**private** **int** studentNumber;

**public** **double** getGPA() {

**return** GPA;

}

**public** **void** setGPA(**double** gPA) {

GPA = gPA;

}

**public** **int** getStudentNumber() {

**return** studentNumber;

}

**public** **void** setStudentNumber(**int** studentNumber) {

**this**.studentNumber = studentNumber;

}

**public** **void** uniAtendee() {

System.***out***.println("I do attend the University");

}

**public** **void** whatIsSSN() {

System.***out***.println("SSN is 102-31-2311");

}

}

**public** **class** Staff **extends** UniPerson **implements** SSN {

**private** String title;

**private** **int** staffNum;

**public** String getTitle() {

**return** title;

}

**public** **void** setTitle(String title) {

**this**.title = title;

}

**public** **int** getStaffNum() {

**return** staffNum;

}

**public** **void** setStaffNum(**int** staffNum) {

**this**.staffNum = staffNum;

}

**public** **void** whatIsSSN() {

System.***out***.println("SSN is : 132-93-2331");

}

**public** **void** uniAtendee() {

System.***out***.println("I do not attend the school, I provide my services");

}

}

**public** **class** BuisStudent **extends** Student {

**private** String hardClass;

**private** String ezClass;

**public** String getHardClass() {

**return** hardClass;

}

**public** **void** setHardClass(String hardClass) {

**this**.hardClass = hardClass;

}

**public** String getEzClass() {

**return** ezClass;

}

**public** **void** setEzClass(String ezClass) {

**this**.ezClass = ezClass;

}

@Override

**public** **void** whatIsSSN() {

System.***out***.println("SSN is : 522-03-1234");

}

}

**public** **class** Teacher **extends** Staff {

**private** **double** salary;

**private** **int** workHoursPerWeek;

**public** **double** getSalary() {

**return** salary;

}

**public** **void** setSalary(**double** salary) {

**this**.salary = salary;

}

**public** **int** getWorkHoursPerWeek() {

**return** workHoursPerWeek;

}

**public** **void** setWorkHoursPerWeek(**int** workHoursPerWeek) {

**this**.workHoursPerWeek = workHoursPerWeek;

}

}

**public** **class** Faculty **extends** Staff{

**private** **double** salary;

**private** **double** workHoursWeekly;

**public** **double** getSalary() {

**return** salary;

}

**public** **void** setSalary(**double** salary) {

**this**.salary = salary;

}

**public** **double** getWorkHoursWeekly() {

**return** workHoursWeekly;

}

**public** **void** setWorkHoursWeekly(**double** workHoursWeekly) {

**this**.workHoursWeekly = workHoursWeekly;

}

@Override

**public** **void** whatIsSSN() {

System.***out***.println("SSN is : 034-31-9421");

}

}

**public** **class** TestHarn {

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

Faculty sansa = **new** Faculty();

Teacher pablo = **new** Teacher();

BuisStudent jamin = **new** BuisStudent();

CompStudent tyrion = **new** CompStudent();

//BuisStudent JAMIN

jamin.setAge(21);

jamin.setName("Jamin");

System.***out***.println( jamin.getName() + " is "+ jamin.getAge());

jamin.uniAtendee();

jamin.whatIsSSN();

jamin.setGPA(1.2);

jamin.setStudentNumber(12343242);

System.***out***.println(jamin.getName() +" student number is "+ jamin.getStudentNumber());

System.***out***.println(jamin.getName() +" has a "+ jamin.getGPA() + " GPA");

jamin.setEzClass("English");

jamin.setHardClass("Calculus");

System.***out***.println("Jamin's easiest class is "+ jamin.getEzClass());

System.***out***.println("Jamin's hardest class is "+ jamin.getHardClass());

System.***out***.println("\n");

System.***out***.println("\n");

//CompStudent TYRION

tyrion.setAge(24);

tyrion.setName("Tyrion");

System.***out***.println( tyrion.getName() + " is "+ tyrion.getAge());

tyrion.uniAtendee();

tyrion.whatIsSSN();

tyrion.setGPA(4.0);

tyrion.setStudentNumber(825284248);

System.***out***.println(tyrion.getName() +" student number is "+ tyrion.getStudentNumber());

System.***out***.println(tyrion.getName() +" has a "+ tyrion.getGPA() + " GPA");

tyrion.setEzClass("English");

tyrion.setHardClass("Calculus");

System.***out***.println("Tyrion's easiest class is "+ tyrion.getEzClass());

System.***out***.println("Tyrion's hardest class is "+ tyrion.getHardClass());

System.***out***.println("\n");

System.***out***.println("\n");

//Teacher PABLO

pablo.setAge(40);

pablo.setName("Pablo");

System.***out***.println( pablo.getName() + " is "+ pablo.getAge());

pablo.setStaffNum(31313123);

System.***out***.println( pablo.getName() + " staff number is "+ pablo.getStaffNum());

pablo.uniAtendee();

pablo.whatIsSSN();

pablo.setTitle("Teacher in Mystical Arts");

System.***out***.println( pablo.getName() + " is an "+ pablo.getTitle());

pablo.setSalary(30000);

pablo.setWorkHoursPerWeek(40);

System.***out***.println( pablo.getName() + " has an salary of "+ pablo.getSalary()+ " and works for " + pablo.getWorkHoursPerWeek() +

" hours a week.");

//Faculty SANSA

System.***out***.println("\n");

System.***out***.println("\n");

sansa.setAge(34);

sansa.setName("Sansa");

System.***out***.println( sansa.getName() + " is "+ sansa.getAge());

sansa.setStaffNum(34255223);

System.***out***.println( sansa.getName() + " staff number is "+ sansa.getStaffNum());

sansa.uniAtendee();

sansa.whatIsSSN();

sansa.setTitle("Online IT help");

System.***out***.println( sansa.getName() + " is an "+ sansa.getTitle());

sansa.setSalary(80000);

sansa.setWorkHoursWeekly(60);

System.***out***.println( sansa.getName() + " has an salary of "+ sansa.getSalary()+ " and works for " + sansa.getWorkHoursWeekly() +

" hours a week.");

}

}

**public** **interface** SSN {

**public** **void** whatIsSSN();

}

As said in zybooks, abstract classes can be used in interfaces as long the word implements is used. On the other hand for inheritance the word extends is used to reference the subclass or superclass. Abstract classes can contain both abstract and non-abstract methods. Also, an interface needs to have an implemented abstract class, if not it will give an error. An abstract class is an IS-A relationship while interfaces use a CAN-DO as said in the project file.

The four OOP Concepts

Abstraction – “Is the process of hiding and implementing, the user is provided with the output”.(tutorials point)

Encapsulation – Pretty much what it sounds it acts on all the methods together. We did this many time in the examples in class, we did it by using the private command and while generating the setters and getters. You can control what data type goes into the fields.

Inheritance – As we did in class the animals class, used inheritance by using the extend keyword we were able to use this with a subclass so it could reference whatever methods were used in it. IS-A.

Polymorphism – This is when we are able to change the form of methods by using the @Override before an the method to show that it is going to be overwritten and it will not do, what it was orignially inttended to.