CET325

Advanced Mobile Development

Lecture 2B

Agenda

- Java review
- Exercises solutions
- Java Generics

JDK – Java Development Kit

In the cells (Windows) JDK in installed on

- `C:\Program Files\Java\jdk1.8.0_101\`
  - Important: is "`jdk`" and not "`jre`" (Java Runtime Environment). There is no compiler (`javac`) in JRE.
  - Usually a system variable is pointing at
    `set JAVA_HOME=C:\Program Files\Java\jdk1.8.0_101\`
  - `javac` is in `%JAVA_HOME%\bin`
  - You may add it to your PATH
  - `set PATH=%PATH%;%JAVA_HOME%\bin`

Java Object Class

- Every class in Java extends Object class https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html
- Inherited methods (they must usually be overridden in your class declaration)
  - toString()
  - equals()
  - …

Java – Command line arguments

- Command line arguments

```
class Wk1Ex2 {
    public static void main(String[] args) {
        if(args.length == 3) {
                // args[0]     - first argument
                // args[1]     - second argument
        }
        else {// error wrong number of arguments}
```

- equals vs ==
  - If (args[0]==“e”) {} else {}
  - If (args[0].equals(“e”)) {} else {}

Java – Arguments validation

```
if(!args[0].equals("e") && !args[0].equals("d")) {
     System.out.println(args[0] + " error";
     // return or exit
}
int arg2 = Integer.parseInt(args[1]);
if(arg2 < 1 || arg2 > 26) {
   System.out.println(args[1]+ " error");
  // return or exit
}
if(!args[2].matches("[a-z]+"){

    // return or exit
}
```

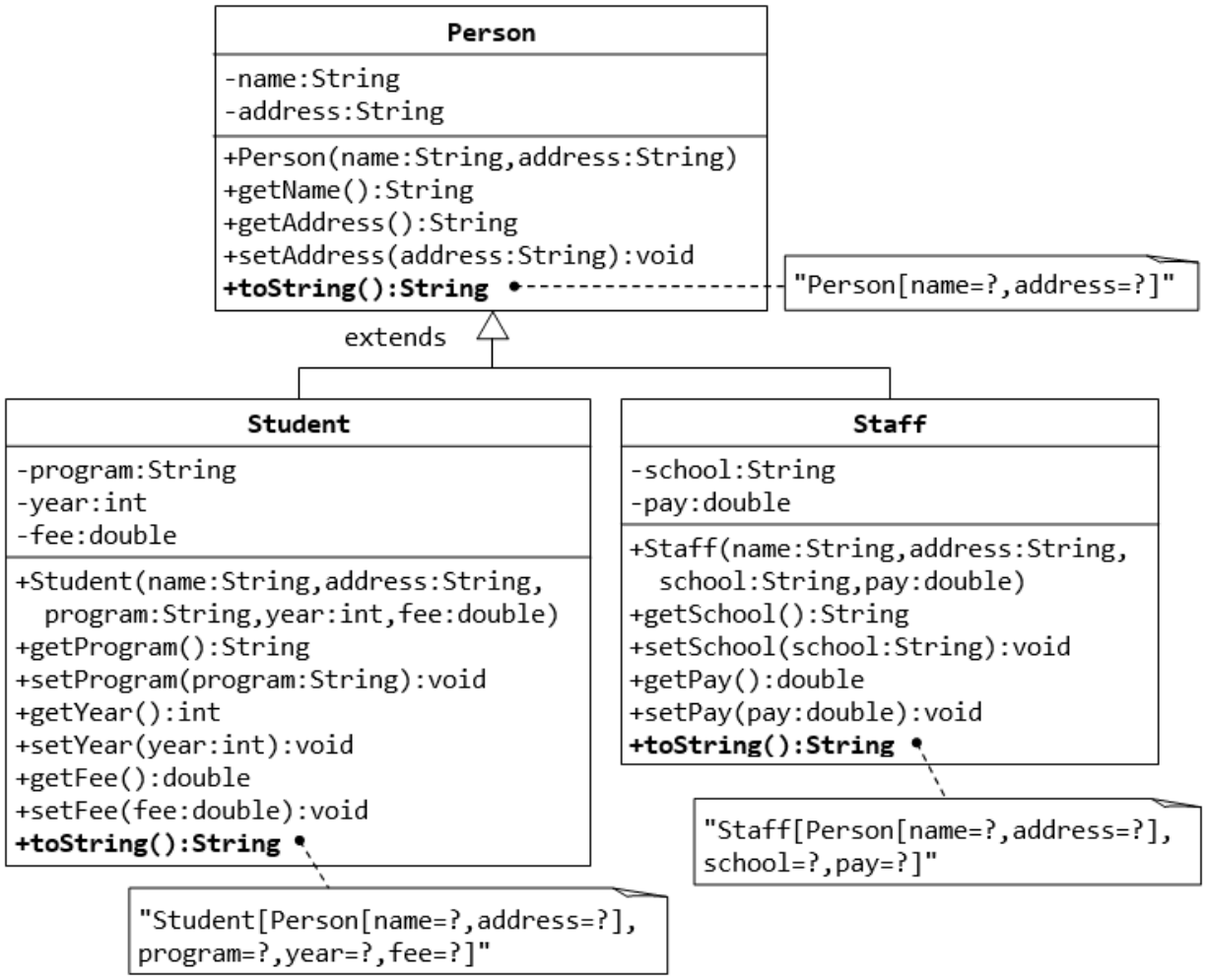
Java – String Shift

```
class C
{
        private int shift = 0;
        private final static char alphFirst = 'a';
        private final static char alphLast = 'z';
        private final static int alphSize = 'z'-'a'+1;

        public C (int shift)
                        {this.shift = shift;}

        public String e(String msg){
                String s = "";
                int len = msg.length();
                for(int x = 0; x < len; x++){
                        char c = (char)(msg.charAt(x) + shift);
                        if (c > alphLast)
                                s += (char)(msg.charAt(x) + shift - alphSize));
                        else
                                s += (char)(msg.charAt(x) + shift);
                            }
                return s;
                }
        }
}
```

Java Inheritance



Java Inheritance

```
class Person {
    private String name;
    private String address;

    Person(String name, String address) {
        this.name=name;
        this.address=address;
    }
       public String toString() {
        return "Person[name="+name+",address="+address+"]";
    }
}
```

Java Inheritance

```
class Student extends Person {

    private String program;
    private int year;
    private double fee;

    Student(String name, String address, String program,    int year,
         double fee) {
        super(name, address);
        setProgram(program);
        setYear(year);
        setFee(fee);
    }            // define setters and getters here
         public String toString() {
        return "Student[" + super.toString() + ",program=" + getProgram() +
         ",year=" + getYear() + ",fee=" + getFee() + "]";
    }
```

Java Generics

- *Generics* enable types (classes and interfaces) to be parameters when defining classes, interfaces and methods

Java Generics

Benefits:

- Stronger type checks at compile time
- Implement generic algorithms
- Elimination of casts

```
List list = new ArrayList();
list.add("hello");
String s = (String) list.get(0);
```

```
List<String> list = new ArrayList<String>();
list.add("hello");
String s = list.get(0);   // no cast
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Java Resources

- Java Official documentation
  https://docs.oracle.com/javase/8/docs/
- Java Tutorials
  https://docs.oracle.com/javase/tutorial/