Programming for Mobile Computing
EECS 1022

`moodle.yorku.ca`

Question

How many labs will there be?

Some Questions and Answers

Question

How many labs will there be?

Answer

There will be four or five labs for marks. If time allows, I will develop additional labs for practice.

Some Questions and Answers

Question

Can the labs be provided well in advance?

Some Questions and Answers

Question

Can the labs be provided well in advance?

Answer

I wish! Given that I have to develop all the lecture material and labs on the fly, this will be very difficult. I will post the labs as soon as I have prepared them.

Some Questions and Answers

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I wish! Given that I have to develop all the lecture material and labs on the fly, this will be very difficult. I will post the labs as soon as I have prepared them.

Question

Can you post the slides well in advance of the lecture?

Some Questions and Answers

Question

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Answer

I wish! Given that I have to develop all the lecture material and labs on the fly, this will be very difficult. I will post the labs as soon as I have prepared them.

Question

Can you post the slides well in advance of the lecture?

Answer

I wish! Given that I have to develop all the lecture material and labs on the fly, this will be very difficult. I will post the slides as soon as I have prepared them. This will probably be less than one hour before the start of the lecture.

EECS 1012
HTML
CSS
JavaScript

EECS 1012	EECS 1022
HTML	Java
CSS	XML
JavaScript	

| EECS 1012		EECS 1022
HTML	Model	Java
CSS	View	XML
JavaScript	Controller	Java

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Before discussing Model-View-Controller, let us first have a very brief look at Java and XML.

Programming languages

ABC, Ada, Algol 60, Algol 68, Alice, APL, Basic, BPEL, C, C++,
C#, Caml, COBOL, CSP, Eiffel, Emacs Lisp, Erlang, Esterel,
Fortran, Haskell, IMP, Java, JavaScript, LaTeX, Lisp, LOTUS,
Lustre, Maple, Mathematica, MATLAB, Mesa, Metafont, Miranda,
ML, Modula-2, Oak, Oberon, Objective Caml, occam, Pascal, Perl,
PHP, Pict, Pizza, PL/I, PostScript, Prolog, Promela, Python,
Scala, Scheme, Simula, Smalltalk, SNOBOL, SOAP, Tcl, TeX,
Turing, Visual Basic, Z, . . .

Java is well-designed and popular.
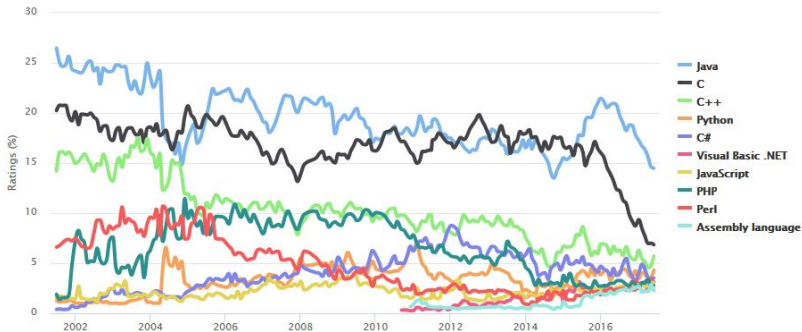

Source: www.tiobe.com

In the early 1990s, James Gosling and some of his colleagues at Sun Microsystems, developed a programming language to program device controllers. The language was called Oak after an oak tree that stood outside Gosling's office. The language was expanded to a general purpose programming language and was renamed Java (because Oak was already a trademark). On May 23, 1995, Java was announced.

Java

"Even though the Web had been around for 20 years or so, with FTP and telnet, it was difficult to use. Then Mosaic came out in 1993 as an easy-to-use front end to the Web, and that revolutionized people's perceptions. The Internet was being transformed into exactly the network that we had been trying to convince the cable companies they ought to be building. All the stuff we had wanted to do, in generalities, fit perfectly with the way applications were written, delivered, and used on the Internet. It was just an incredible accident. And it was patently obvious that the Internet and Java were a match made in heaven. So that's what we did."

James Gosling

James Gosling was born near Calgary in 1955. He received his BSc in computer science from the University of Calgary and his PhD from Carnegie Mellon University. In 2007, he was made an officer of the Order of Canada. He is best known as "the father of the Java programming language."
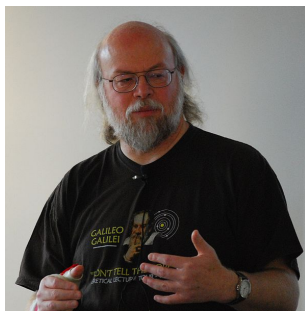
Source: Peter Campbell

```java
public class BMIModel
{
    private double weight;
    private double height;

    /**
     * Initializes this model with the given weight and height.
     *
     * @param weightText weight as text.
     * @param heightText height as text.
     */
    public BMIModel(String weightText, String heightText)
    {
        this.weight = Double.parseDouble(weightText);
        this.height = Double.parseDouble(heightText);
    }

    ...
```

XML

XML is short for Extensible Markup Language. It is widely used for the representation of arbitrary data.

```xml
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    tools:context="ca.roumani.bmi.BMIActivity">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Your Weight"
        android:id="@+id/weightLabel"
        android:layout_alignParentTop="true"
```

Model-View-Controller

We will use the model-view-controller (MVC) pattern to implement mobile apps.

- The model represents the data and provides ways to manipulate the data.
- The view provides a graphical representation of the model.
- The controller translates the client's interactions with the view into actions that manipulate the view and the model.

Model-View-Controller

Question

In Lab 1, what data is stored and manipulated in the model?

Model-View-Controller

Question

In Lab 1, what data is stored and manipulated in the model?

Answer

The weight and height are stored. This data is manipulated to compute the body mass index.

```java
public class BMIModel
{
  private double weight;
  private double height;

   ...

  public String getBMI()
  {
     ...
  }
}
```

Model-View-Controller

Question

In Lab 1, which components are used in the view?

Model-View-Controller

Question

In Lab 1, which components are used in the view?

Answer

TextView, EditText and Button.

XML

```xml
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
  ...

  <TextView
    ... />

  <EditText
    ... />

  ...

  <Button
    ... />

  ...
</RelativeLayout>
```

Model-View-Controller

Question

In Lab 1, which interactions with the view does the controller
handle?

Model-View-Controller

Question

In Lab 1, which interactions with the view does the controller handle?

Answer

Pressing of the button.

```java
public class BMIActivity extends AppCompatActivity
{
  ...

  public void buttonClicked(View view)
  {
    ...
  }
}
```

Trygve Reenskaug is a Norwegian computer scientist and professor emeritus of the University of Oslo. In 1979, he formulated the MVC pattern.

Source: Trygve Reenskaug

Ping Pong App

Problem

Develop an app with a single button. Initially, the app shows the text Ping. Whenever the button is pressed, the text changes from Ping to Pong or vice versa.

Model

Question
Of which data do we need to keep track?

Model

Question

Of which data do we need to keep track?

Answer

Whether the view should show Ping or Pong.

Model

Question

Of which data do we need to keep track?

Answer

Whether the view should show Ping or Pong.

Question

How can we represent that information?

Model

Question

Of which data do we need to keep track?

Answer

Whether the view should show Ping or Pong.

Question

How can we represent that information?

Answer

In many different ways.

Question

How many different values do we need to represent?

Question

How many different values do we need to represent?

Answer

Two.

Model

Question

How many different values do we need to represent?

Answer

Two.

The type $\mathrm{boolean}$ has two values: true and false.

Model

Problem

Create a class named PingPongModel.

Problem

Add a private attribute of type boolean.

Problem

Add a public constructor that initializes the attribute to true.

Problem

Add a public method that returns either Ping or Pong.

According to the Java Language Specification, the name of a class should be a sequence of letters and digits and the symbols _ and $, starting with a letter.

Rules how to write your code such as

- naming conventions for classes, variables, etc,
- indentation,
- etc.

An example of code conventions can be found at the URL
`babelfish.arc.nasa.gov/trac/jpf/wiki/devel/coding_conventions`.

Code convention for class names

- Capitalize first letter.
- If the name is made up of more than one word, then capitalize the first letter of each.
- If the name is an acronym, then capitalize all letters.

Question

Which of the following class names adhere to the code convention?

- URL
- Sequence_Of_Characters
- Url
- CharacterSequence

Code convention for variables names

- Use lowercase letters.
- If the name is made up of more than one word, capitalize the first letter of each subsequent word.

Question

Which of the following variable names adhere to the code convention?

- myVariable
- MyVariable
- my_variable

Problem

Add to the class PingPongActivity a method that sets the text of the view to either Ping or Pong.

View

Problem

Develop a view with a single button.

Model-View-Controller

Question

How do the model, view and controller interact?