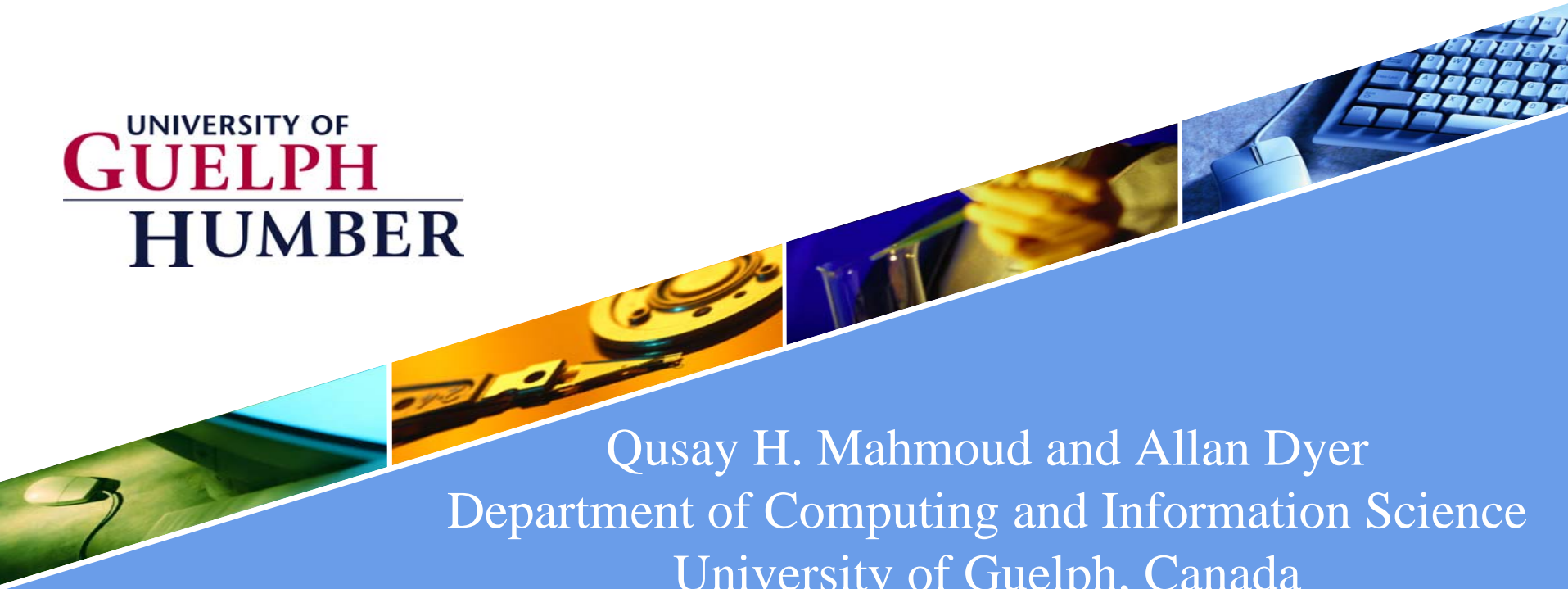




# Integrating BlackBerry Wireless Devices into Computer Programming and Literacy Courses

UNIVERSITY OF  
**GUELPH**  
HUMBER



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# Outline



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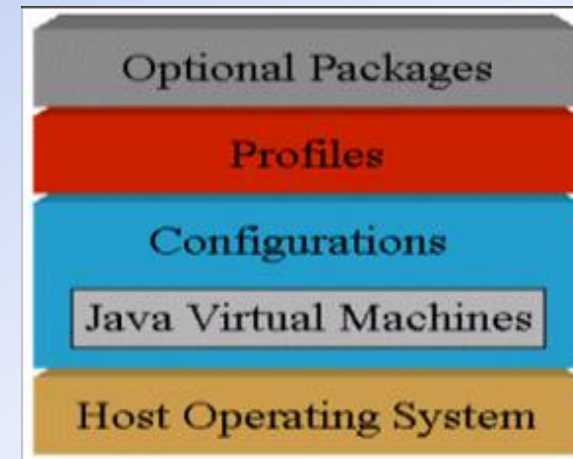
Conclusion

# Introduction

- 
- Handheld wireless devices are pervasive
  - There is a need for academic innovations in computer literacy and prog. courses
  - A different programming model
  - Goals:
    - Introduce students to BlackBerry devices
    - Investigate how to integrate devices into CS curriculum
    - Teach students how to develop wireless apps
    - Revitalize CS education

# Java ME and the BlackBerry Device

- Java ME (formerly J2ME) is a platform for creating apps for consumer & embedded devices
  - We used CLDC & MIDP
  - Connected Limited Device Configuration
  - Mobile Information Device Profile
- The BlackBerry is a general purpose communicating device (email)
  - Many BlackBerry devices support Java ME (we used 6280 model)



# Computer Literacy

- Over the past 15-20 years the basic apps for literacy courses have been word processing, spreadsheet, ..., on desktops
- Recently, they include Internet and Web development
- Most students focus on the social side of computing: instant messaging, music, videos
- Integrated BlackBerry devices
  - In the lab students experiment with the device and its apps (email, web browsing)
  - For most students, their first exposure to BlackBerry
  - <http://cis1200.cis.uoguelph.ca/blackberry.htm>

# Computer Programming I

- Provides a step-by-step approach to prog.
- **Programming for fun:** HTML, JavaScript, Java
- Use pair prog. in labs and assignments
- BlackBerry
  - Two weeks of lecture and 6-hrs of labs
  - Students learn about Java ME and the programming model for wireless apps
  - Students learn how to write simple apps and deploy them on the device

# User-Centered Programming

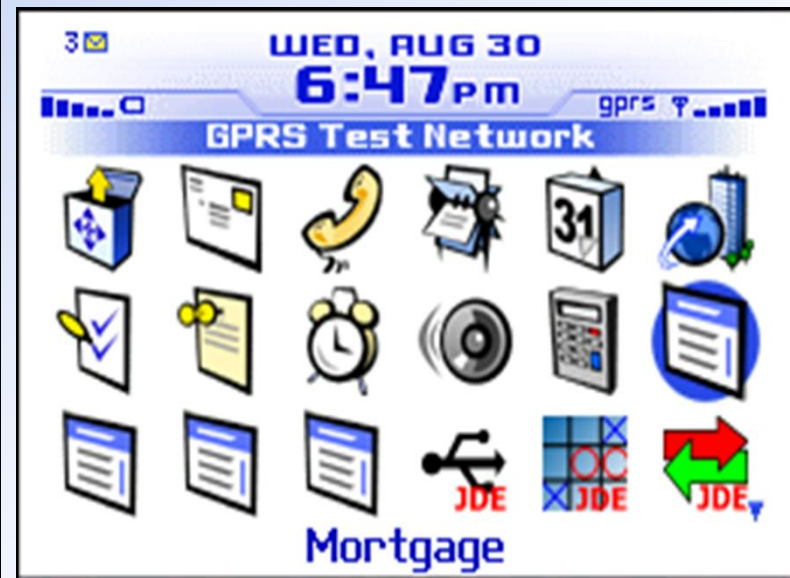
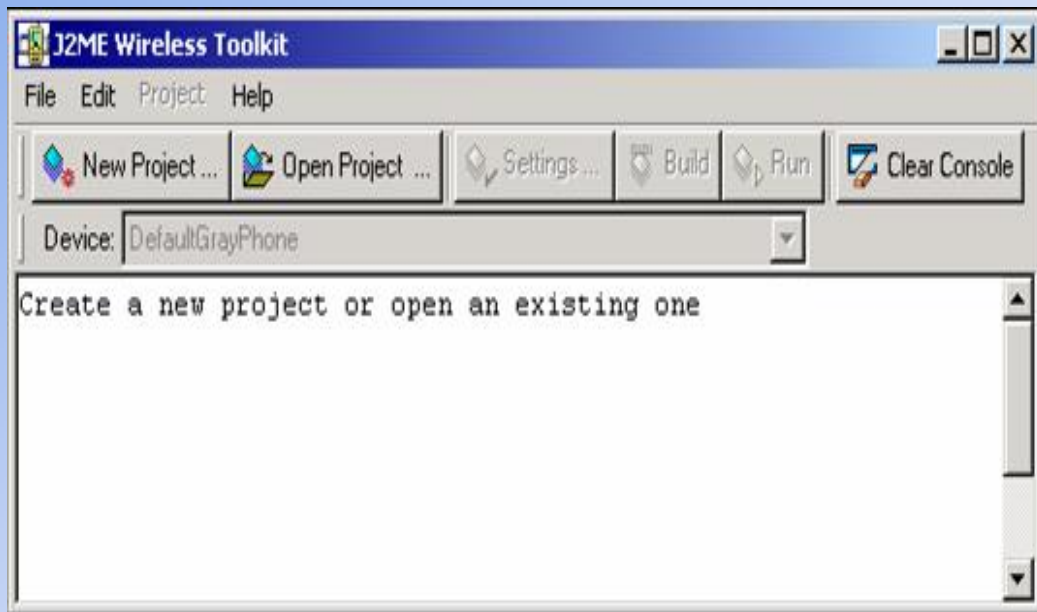


- A third semester course
- GUI programming using AWT/Swing
- The goal (along with Data-Centered Prog.) is to produce software developers to build interactive client/server apps
- BlackBerry
  - Three weeks of lectures and 9-hrs of labs
  - Students learn about Java ME and prog. models
  - Students learn how to write networked wireless apps that interact with remote services

# App Development Tools and Deployment

## ■ Tools

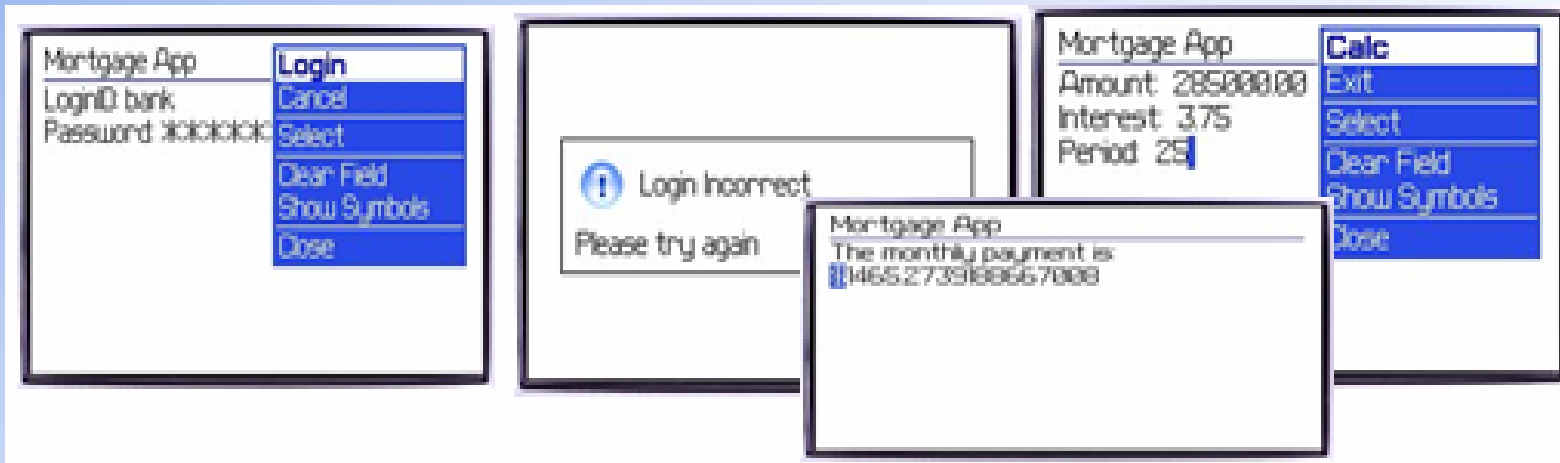
- Sun Java Wireless Toolkit 2.5 for CLDC ([java.sun.com/products/sjwtoolkit](http://java.sun.com/products/sjwtoolkit))
- BlackBerry Simulator ([blackberry.com/developers/download](http://blackberry.com/developers/download))
- BlackBerry Java Development Environment



- Students learn how to:
  - Run existing wireless apps (a MIDlet interacts with Yahoo finance server)
  - Use tools to convert existing MIDlets (.jad&.jar) into .cod format for the BlackBerry
  - Deploy apps on the BlackBerry and run them
  - Write simple apps (first year) and networked apps (second year)
  - Test apps using simulation and emulation tools
  - Package apps for deployment

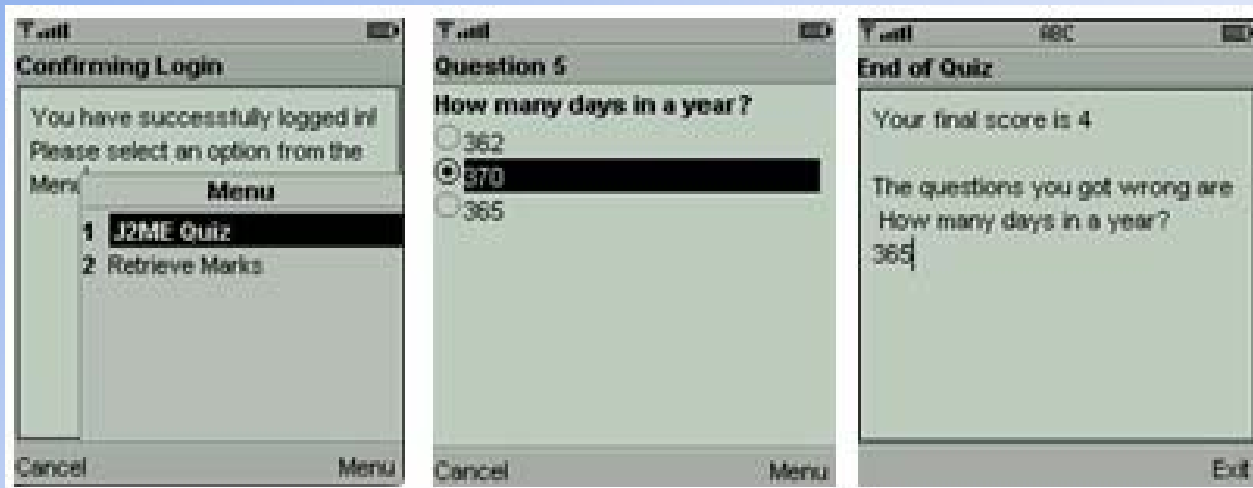
# Assignments (1)

- Computer Programming I
  - Students developed two versions of a mortgage calculator (desktop and BlackBerry)
  - Students learn that the application logic doesn't change
  - **Note: no support for floating point numbers in CLDC 1.0; no Math.pow() in CLDC 1.1**



## Assignments (2)

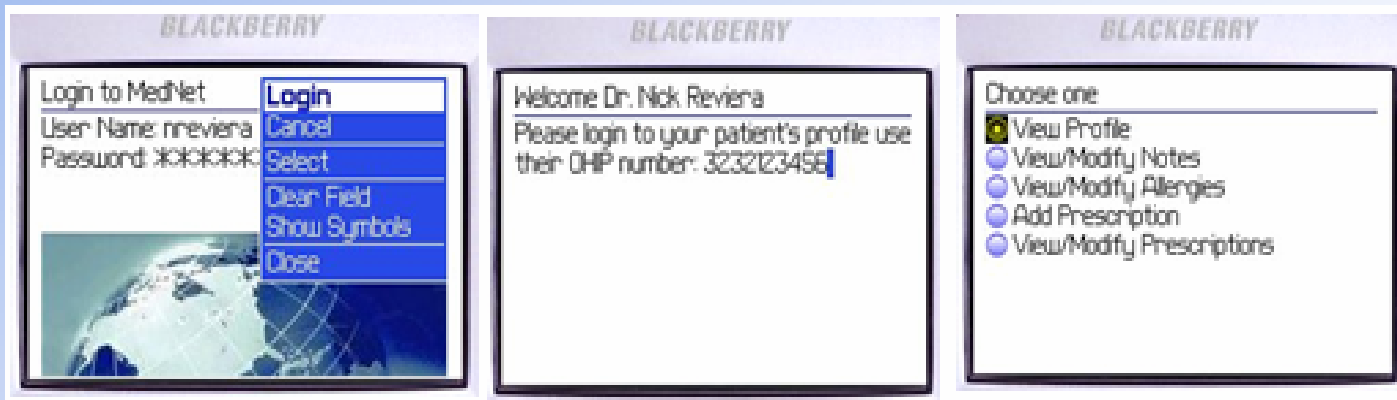
- User-Centered Programming
  - a) Apply the Model-View-Controller (MVC) to design and develop a multiple-choice quiz



- b) An application to retrieve students' marks from a Web service by interacting with a Perl script

# A Third Semester Project

- Students work on a group project (5-6 members per group).
- A joint project with Data-Centered Prog.
- A system for linking doctors and pharmacists to manage patients data and prescriptions



# Conclusions

1

Teaching computer programming in the context of wireless apps provides a motivating framework for students and inspires them to work hard. They'll be able to program their own cell-phones

2

Students expect us to integrate bleeding-Edge technology in courses.

**It raises the level of excitement and satisfaction!**

3

Students are exposed to a new and rapidly advancing area of computing.

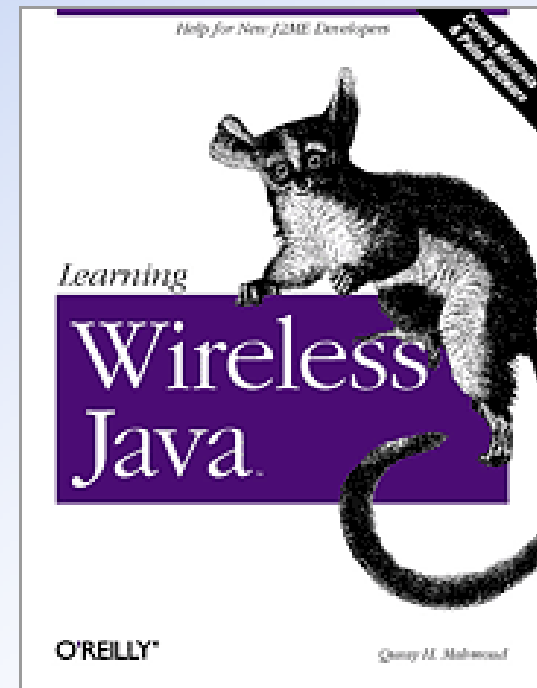
The experience prepares them well for jobs at RIM (many of our co-op students work there)

# Java ME Resources for Academics

- Tutorials, articles, slides, sample apps
- Sample labs will be posted soon
- Feel free to use them, comments are welcome.

<http://www.uoguelph.ca/~qmahmoud/javame>

## Learning Wireless Java (O'Reilly)



# Thank You !

## Q & A

