

IS12 - Introduction to Programming

Lecture 1: Introduction

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<http://www2.sis.pitt.edu/~peterb/0012-051/>

Outline

- Introduction to course goals and content
 - Books
 - Tools
- What is programming?
- Introduction to Karel the Robot
 - The Karel programming environment
 - Creating words
 - Writing programs



IS12 and BSIS

- Information Science and programming
- So, do we need to learn a programming language?
 - To understand it, you have to do it!
 - No magic in programming!
- BSIS: need 2 programming courses
 - IS12 \Rightarrow IS15 \Rightarrow IS18 \Rightarrow IS20



What is special for IS12?

- 1/3 of BSIS students fail IS15
- Most courses offer a steep introduction
- Gentle introduction for the beginners
- Prepares for IS15, IS18, and IS20
- Languages:
 - Karel the Robot (1/4 of the course)
 - Introduction to C (3/4 of the course)
- **Is it the right course for you?**



Learning programming

- Catch up early!
 - Get books, check/use Web tools, install and get yourself familiar with programming environments
- Practice, practice, practice!
 - Run all examples, modify it, explore
 - Check yourself on quizzes
 - Solve problems and exercises
- Get help!
 - Ask questions in CourseWeb forums
 - Meet TAs and your instructor during office hours and by appointment



Books

- Books for Karel the Robot
 - Pattis
 - Online tutorial
- Books for C
 - Perry: Absolute Beginner's Guide to C
 - Others
 - Kernighan and Ritchie
 - Deitel and Deitel
 - Multiple free tutorials on the Web. You will be able to access them via Knowledge Sea system



Course Tools

- All information will be provided via course Web site
<http://www2.sis.pitt.edu/~peterb/0012-051/>
- The complete list of tools is provided on Tools section of this site
- *Blackboard* system will be used as the main learning support tool
- *Karel the Robot* environment will be used for programming
- Other tools will be introduced later



Blackboard (CourseWeb)

- Blackboard system will be used for:
 - Posting announcements (WATCH IT!)
 - Posting course materials, assignments, and quizzes
 - Learning about and communicating with each other
 - Asking questions and getting answers
 - Submitting assignments
 - Posting grades



Communication

■ To you

- Watch closely the CourseWeb site for announcements.
- Check your Pitt mail (xyz@pitt.edu) connected to CourseWeb regularly - most important and urgent information will be distributed by e-mail

■ From you

- If a question is not personal (an answer could be useful for others) - *ask via forum*
- If it is a personal question - ask me or TA by e-mail (can do it from CourseWeb too)

■ Office Hours



CourseWeb Assignment (HW1)

- Due Thursday 9/2/03
- Try visible features, ask questions, answer questions
- Home page (**picture!**) - up to 4pts
- Complete a Pre-test - results are not counted towards your grade (1pt)
- Search the Web, find a programming course that uses Karel or a similar language, post URL and a message to the test forum (1pt)



What are computers (robots)?

- “idiot servants” that can do simple operations incredibly fast if you tell them *every step* to do
- like little children in their need for specific and detailed *instruction*
- computers are not “brains” & are not “smart” - they only as good as the *program* they are running

Adapted from J. Wyatt's slides



How to give commands?

- Dialog mode:
 - Give a command
 - Observe results
 - Give another command
 - Observe results
- Programming:
 - Give a set of commands in advance
 - Observe final results



Programs and programming

- What is a program?
 - A set of *instructions* given to a computer to working with *objects* (*world, data*) designed to accomplish a specific task
- What is programming
 - The art to control these “robots”, “servants”, “little children” by writing sets of instructions in advance
 - The art and craft of writing *programs*



Karel the Robot

- Invented by Richard Pattis in 1981
- A Gentle Introduction into Programming
- Used in top universities and colleges
- Learning to program by learning to control Robot Karel acting in its World
 - Learn basic principles of programming
 - Learn main programming constructs (same in Karel, C, Java, Pascal, Basic, etc)



Karel's world

- Horizontal **Streets**
- Vertical **Avenues**
- **Corners (Intersections)**
- **Beepers** situated at corners
- **Walls** separating corners
- **Robot Karel**
 - may stand in any corner
 - can face North, South, West or East



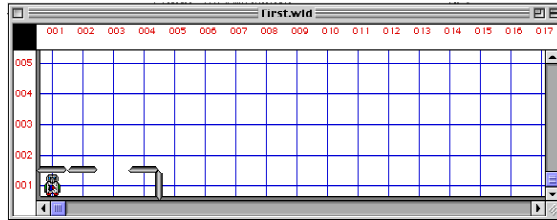
Creating a New World

- Use tab *Initial World* in the environment
- Push *New* to create a new empty world
- Move *cursor* and use world editing tools
 - To place walls
 - To place beepers
 - To position Karel
- Save the world to a file for the future re-use (use `.kw` extension)

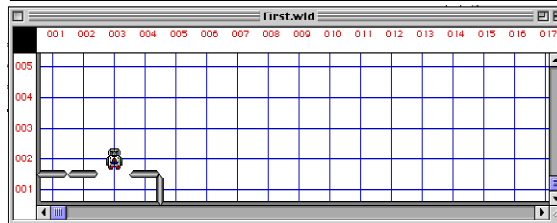
Get out of Jail Problem

- Get Karel out of Jail!

Start:



Target:



Get out of Jail Program

beginning-of-program

beginning-of-execution

move;

move;

turnleft;

move;

turnoff;

end-of-execution

end-of-program



Now what?

- Go to “Program” tab
 - Create new program
 - Write/Edit program
 - Compile program
- Go to “Execute”
 - *Initialize* execution
 - *Run* program
- The robot will execute the current program in the current world



Before next lecture:

- **Read Syllabus carefully!**
- Try IS12 Web site
- Install / try Karel Environment
- Get / check the books
- Reading assignment:
 - Pattis, Chapter 1,
 - Tutorial Lessons 1 and 2
 - Answer questions from Chapter 1
- Create and save four worlds from the problem1.4.5 in Pattis book