For updated version, please click on
http://ocw.ump.edu.my

Graphical User Interface

Chapter 6: Event-Driven Programming

Editor
Dr Taha Hussein Rassem
Faculty of Computer Systems and Software Engineering
tahahussein@ump.edu.my

Chapter Description

- Aims
  - To understand the concept of sequential Programming
  - To understand the concept of event-Driven Programming
  - To differentiate between the sequential Programming and event-Driven Programming.

- Expected Outcomes
  - Able to understand the concept of sequential Programming and event-Driven Programming.
  - Able to understand the practical aspect in design process to create a better and effective used of product or service.

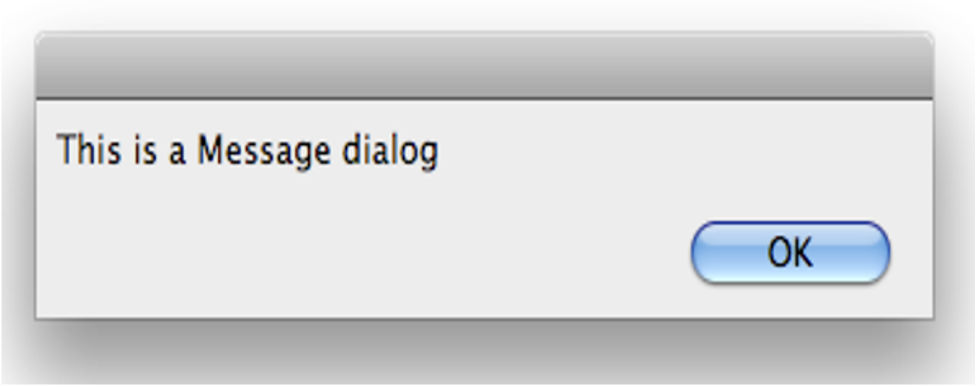
- References
  - Wilbert O. Galitz, The Essential Guide to User Interface Design: An Introduction to GUI Design Principles and Techniques, John Wiley & Sons Inc, 2007.
  - Jenifer Tidwell, Designing Interfaces, O'Reilly, 2011
  - Jeff Johnson, Designing with the Mind in Mind: Simple Guide to Understanding User Interface Design Rules , Morgan Kaufman Publisher, 2010

Chapter Content

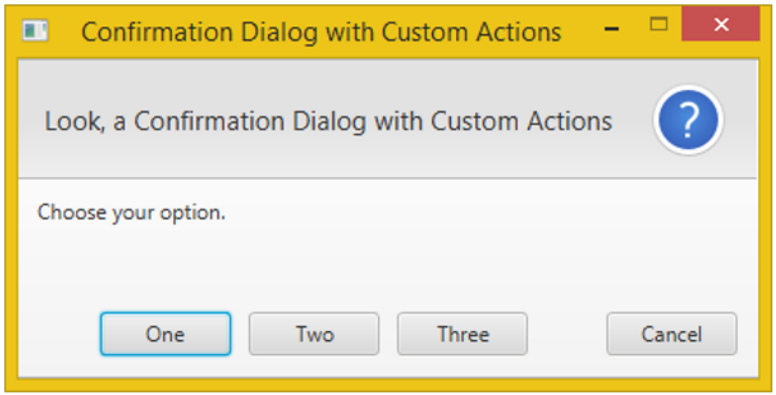
- Dialog box
- Sequential Programming
- Events
- Event-Driven Programming

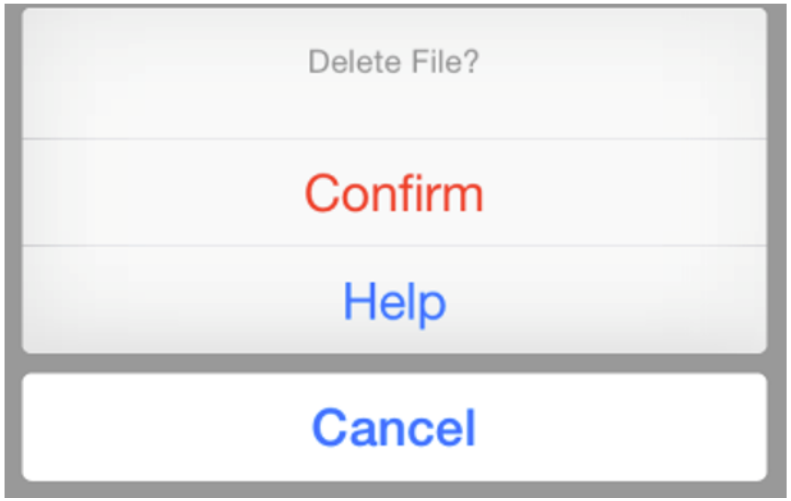
Dialog box

- **A message dialog** displays a message that alerts the user and waits for the user to click the OK button to close the dialog.



- **An option dialog** asks a question and requires the user to respond with an appropriate button.





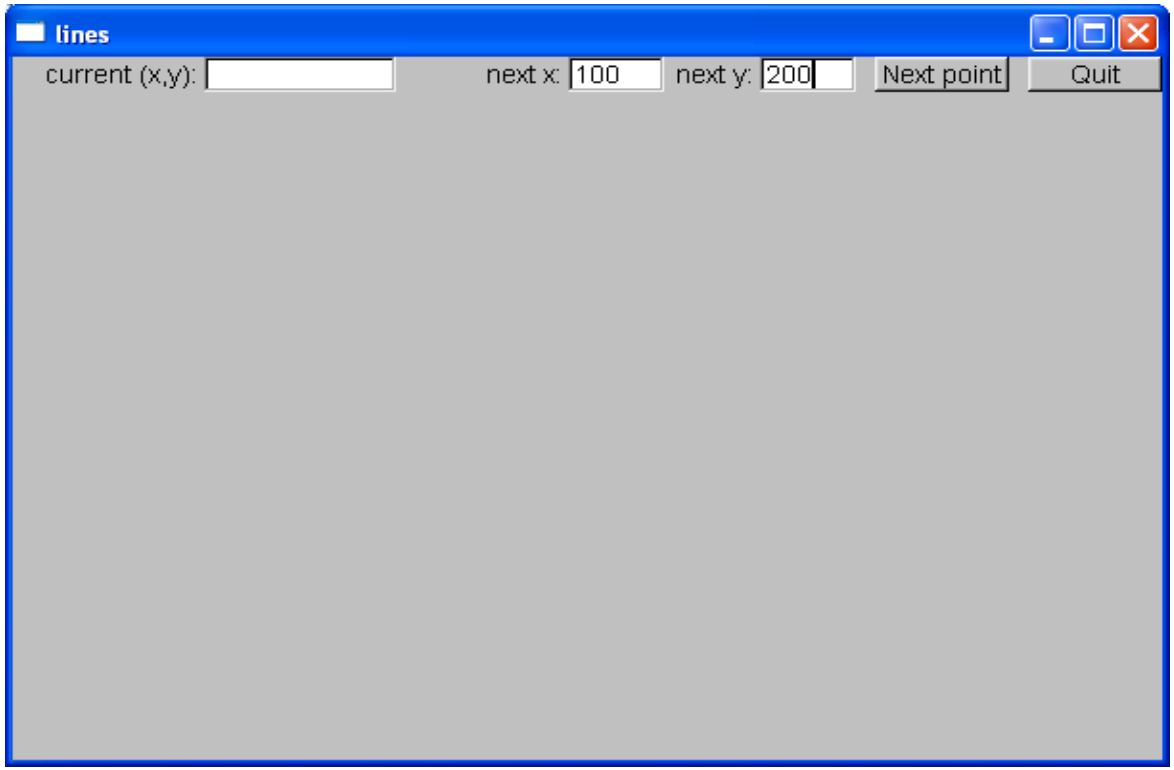
Graphical User Interface

- GUI is based on two techniques
  - Object-oriented programming
  - Events

GUI example

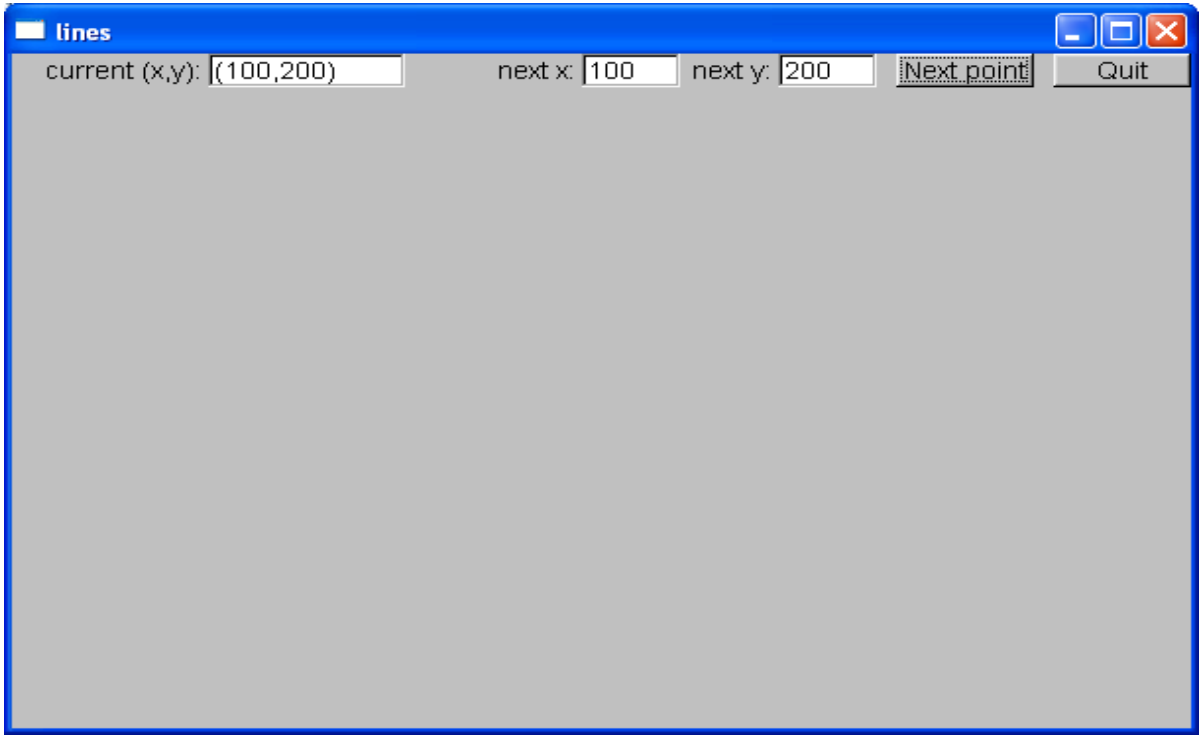
- What inside the window ????
  - 2 **Button**s,
  - 2 **In box**es,
  - an **Out_box.**

GUI example



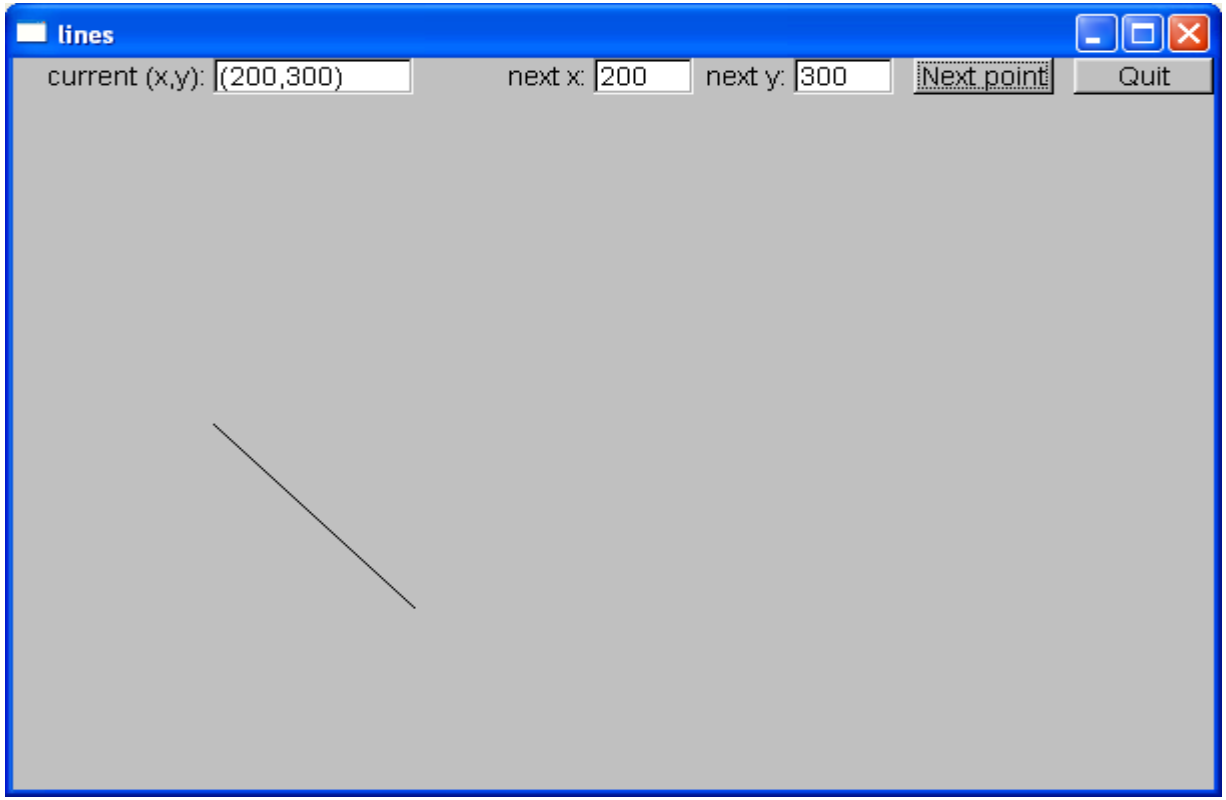
- Enter a point in the **In_box**es.

GUI example



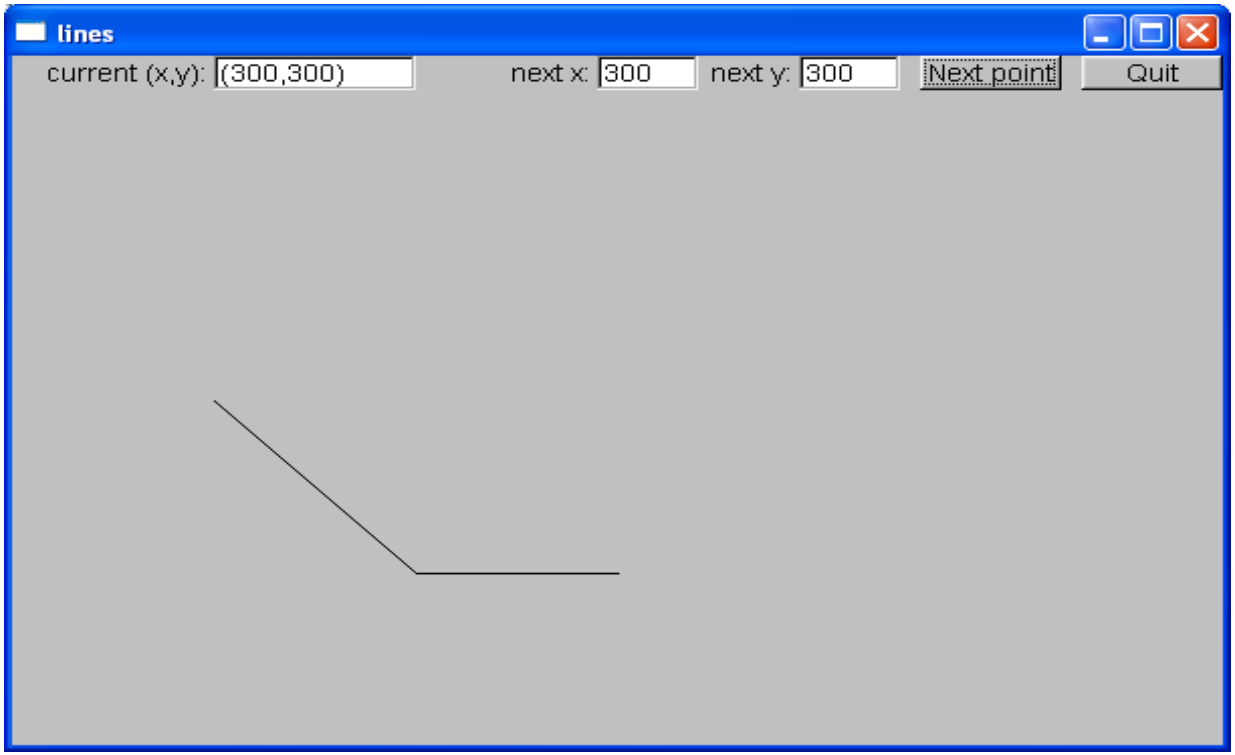
- hit **next point** -----> the current (x,y) will be displayed in the **Out_box .**

GUI example



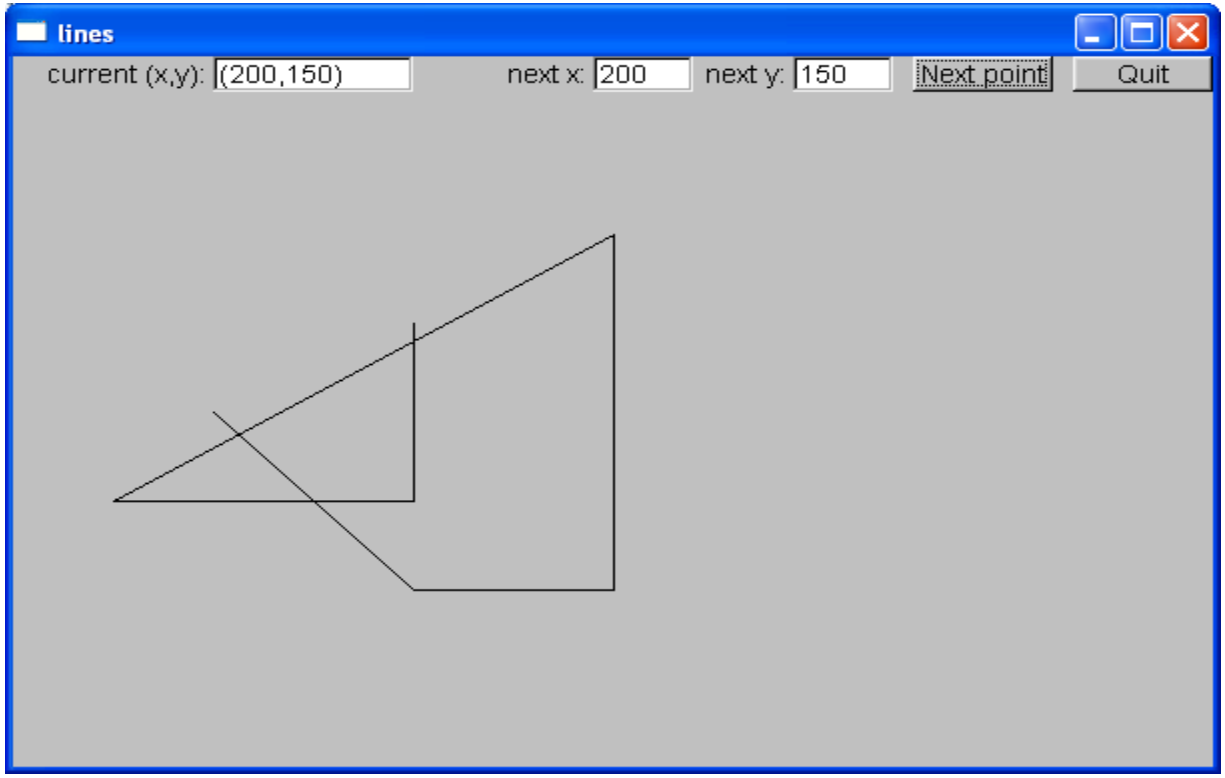
- Adding another point -------> a line .

GUI example



- Three points give two lines
  - Obviously, we are building a polyline .

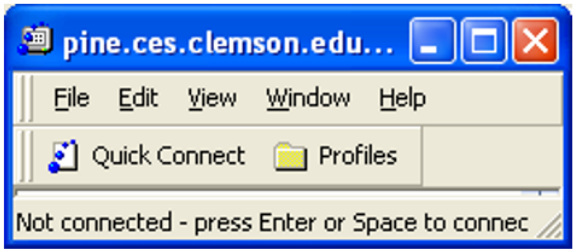
GUI example



- And so on, until you hit **Quit .**

GUI Concepts

- Widget – graphic object with functionality; e.g., button, toolbar, ...
- Window – holds widgets .
- Child/parent – relationships between windows .
- Event / message – how windows communicate .



Anatomy of a Window

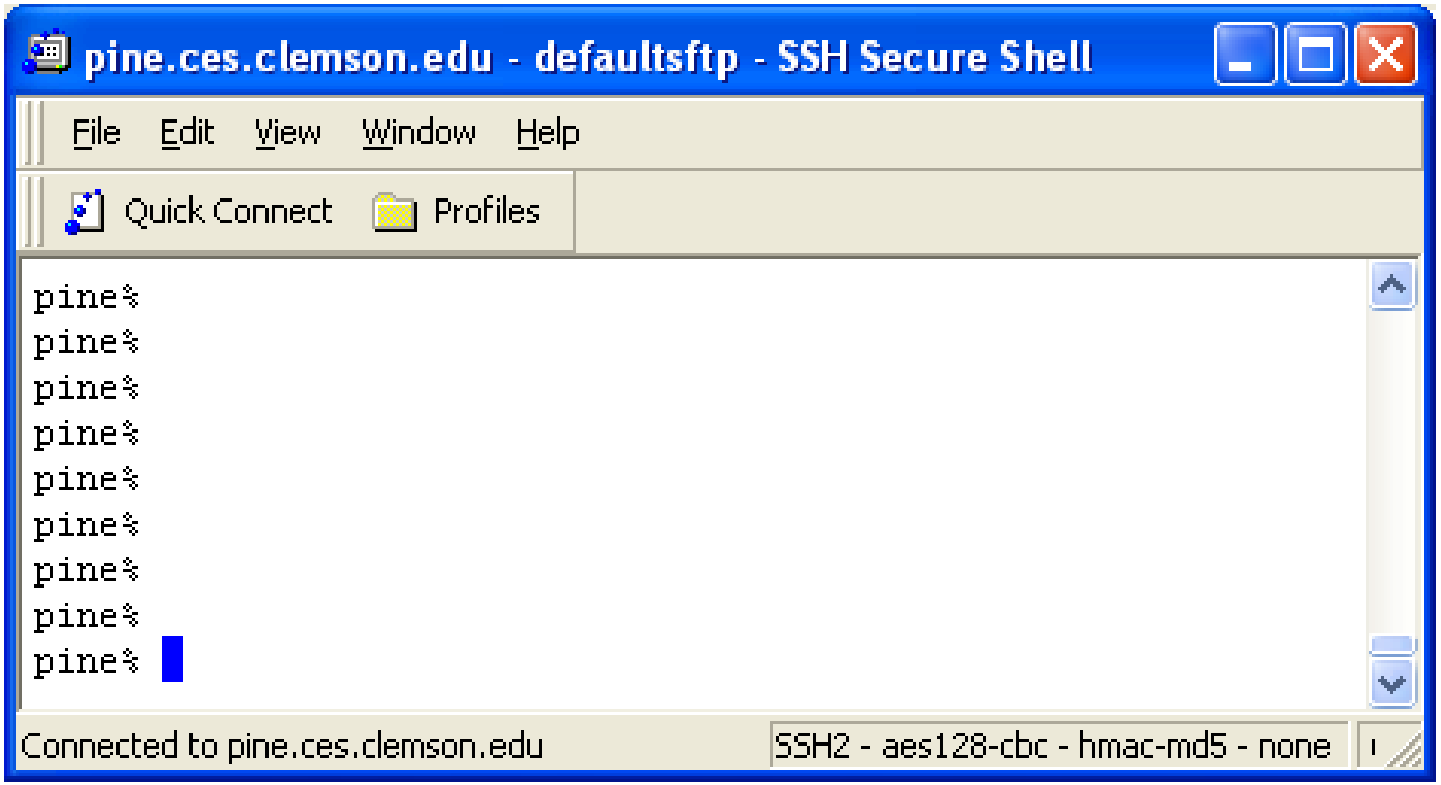
Title bar

Menu

Toolbar

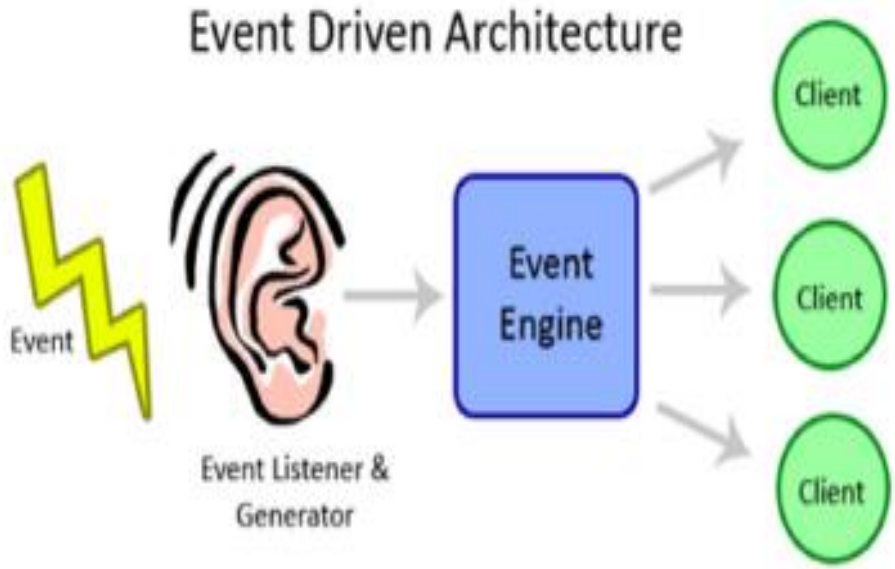
Client area

Status bar



Event driven programming

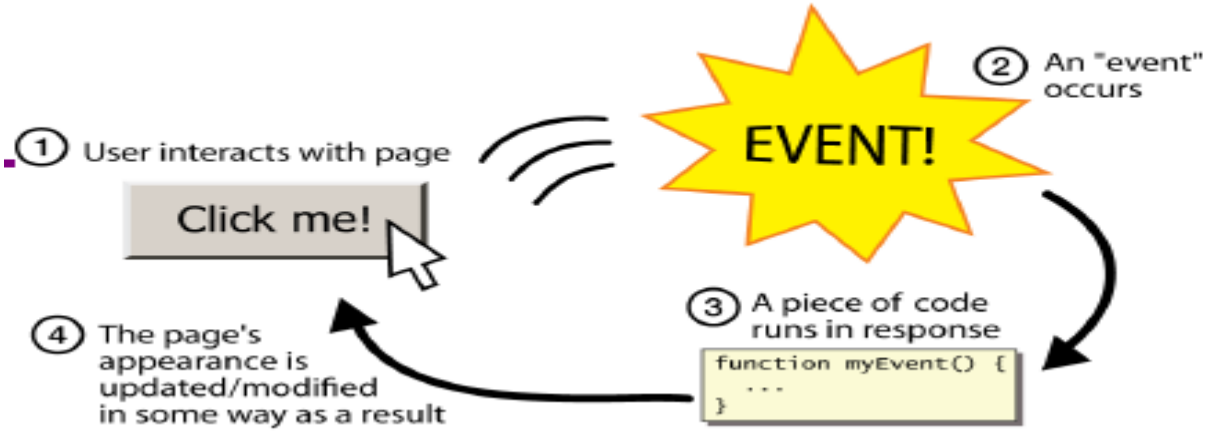
Event-driven programming

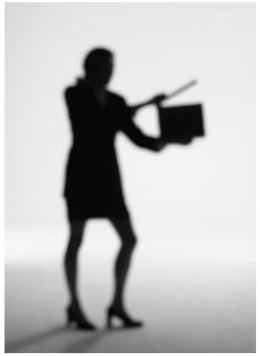


Event-driven programming:

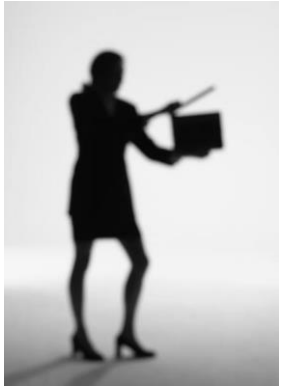
A style of coding where a program's overall flow of execution is dictated by events.

Event



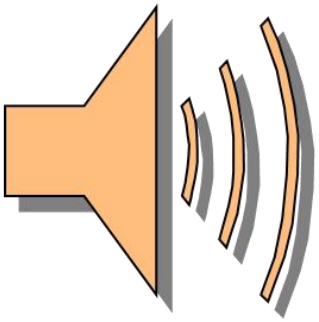


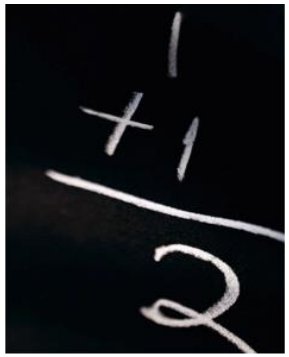
An ***event*** occurs whenever an ***event listener*** detects an ***event trigger*** and responds by running a method called an ***event handler***.



Kinds of GUI events

- Mouse move/drag/click, mouse button press/release
- Keyboard: key press/release, sometimes with modifiers like shift/control/alt/meta/cokebottle
- Touchscreen finger tap/drag
- Joystick, drawing tablet, other device inputs
- Window resize/minimize/restore/close
- Network activity or file I/O (start, done, error)
- Timer interrupt (including animations)





An ***event handler*** is a method that is activated when the event trigger occurs.

- If a component can generate an event, any subclass of the component can generate the same type of event.
- All the event classes are subclasses of EventObject.
- A component on which an event is generated is called the source object.
- Every GUI component can generate MouseEvent, KeyEvent, FocusEvent, and ComponentEvent.

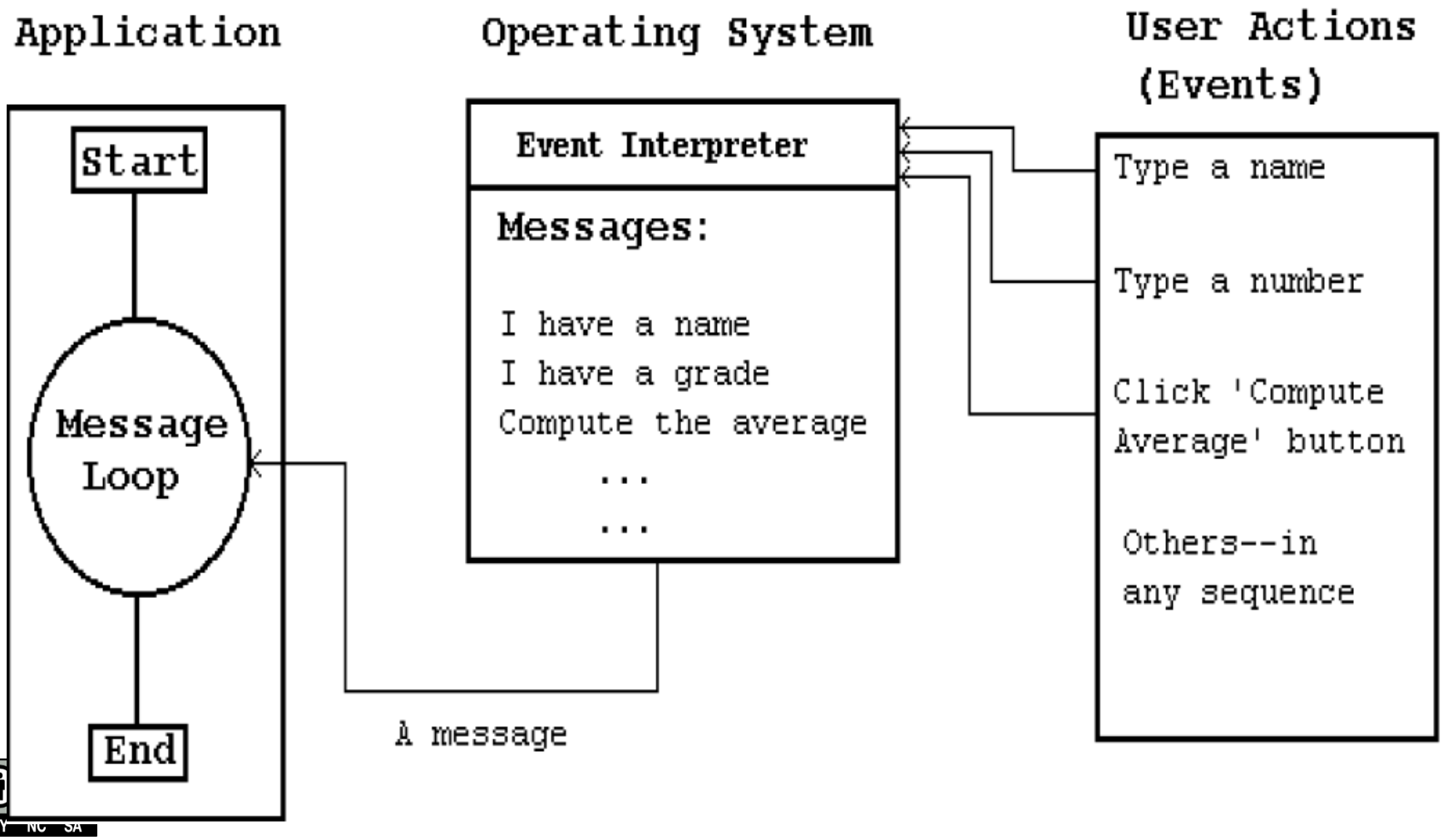
Sequential programming

- program solicits input (polling loop)
- Approach follows a structured sequence of events
- Example: averaging grades
  - Input name .
  - Input 1st grades .
  - Input 2nd grade .
  - Input 3rd grade .
  - Calculate AVG .
  - Output AVG .

EVENT-DRIVEN PROGRAMMING

- Designed to avoid limitations of sequential, procedure-driven methodologies .
- Process user actions (events) as they happen; non-sequential .
- OS detect an event has happened (e.g: there's input) and sends a massage to the program .
- Program then acts on the message .
- Message can occur in any order .

The event driven paradigm



Further readings:

1. http://www.hed.swin.edu.au/design/tutorials/other/design/
2. http://www.ciplex.com/article.php?article_id=102
3. http://webdesign.about.com/od/webdesignbasics/a/aa052807.htm
4. http://www.allgraphicdesign.com/whatisgraphicdesign.html
5. http://www.digital-web.com/articles/principles_of_design/
6. http://webdesign.about.com/od/webdesignbasics/Basics_of_Web_Design.htm
7. **http://www.smashingmagazine.com/index.php/2008/01/31/10-principles-of-effective-web-design/