Digitizing Smith

A Liberal Arts Module — Week 11
CSC111 - Fall 2015

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Summary

- Video Lecture by Prof. Helene Visentin
- LAM Project in **2 phases**
Phase 1
(check bottom of CSC111 page...)

Digitizer
Digitizer

Python Tool

x1, y1, x2, y2, ...
202, 102, 221, 109, ...

GIF
GIF → Digitizer → Python Tool → CSV

x1, y1, x2, y2, ...
202, 102, 221, 109, ...

202, 102, 221, 109, x, y, x, y...
Phase 2
alpha, beta, 202, 102, 221, 109, x, y, x, y...

CSV

Map Rendering

Python App
User Interaction
User Interaction

Generally, the goal of user interface design is to produce a user interface which makes it easy, efficient, enjoyable, and user friendly to operate a machine in the way which produces the desired result.

Button Widgets
Button Widgets

[Diagram of button widget dimensions:]
- Origin of parent
- POS (x, y)
- DIM (height)
- DIM (width)
- Margin width
- Bevel width
- Margin height
class Button:
    """Implements a button, which contains a label (text),
is rectangular (frame), and can be clicked (True) or not clicked."""
    def __init__(self, x1, y1, w, h, text):
        """constructor: pass (x,y) of top left corner,
and width and height. Pass the text displayed in
button."""
        p1 = Point( x1, y1 )
        p2 = Point( x1+w, y1+h )
        self.frame = Rectangle( p1, p2 )
        self.frame.setFill( "white" )
        self.label = Text(Point( x1+w//2, y1+h//2 ), text)
        self.clicked = False

    def draw( self, win ) :
        """display button on window."""
        self.frame.draw( win )
        self.label.draw( win )

def isClicked( self, p ) :
    """Checks if p is inside the frame of the button. Returns True
if p inside frame, False otherwise. If p inside, button
changes state and color."""
    x1, y1 = self.frame.getP1().getX(), self.frame.getP1().getY() 
    x2, y2 = self.frame.getP2().getX(), self.frame.getP2().getY() 

    if x1 <= p.getX() <= x2 and y1 <= p.getY() <= y2:
        self.clicked = not self.clicked
        if self.clicked:
            self.frame.setFill( "yellow" )
        else:
            self.frame.setFill( "white" )
        return True
    else:
        return False
def main():
    global WIDTH, HEIGHT
    win = GraphWin( "Pushbutton Demo", WIDTH, HEIGHT )

    points = [ Point( 100, 100 ),
               Point( 150, 100 ),
               Point( 175, 150 ) ]
    poly1 = Polygon( points )
    poly1.setFill( "orange" )
    poly1.draw( win )

    points = [ Point( 35, 120 ),
               Point( 37.9,129.1 ),
               Point( 46.9,129.1 ),
               Point( 39.7,134.5 ),
               Point( 42.3, 143.1 ),
               Point( 35, 139 ),
               Point( 27.7, 143.1 ),
               Point( 30.3, 134.5 ),
               Point( 23.1, 129.1 ),
               Point( 32.1, 129.1 ) ]
    poly2 = Polygon( points )
    poly2.setFill( "lightgreen" )
    poly2.draw( win )

    win.getMouse()
Recording A Polygon
Recording A Polygon

def main():
    global WIDTH, HEIGHT
    win = GraphWin("Record Polygon", WIDTH, HEIGHT)

    img = Image(Point(WIDTH//2, HEIGHT//2), "smithLogo.gif")
    img.draw(win)

    startB = Button(10, 10, 60, 30, "Start")
    startB.draw(win)
    stopB = Button(80, 10, 60, 30, "Stop")
    stopB.draw(win)

    points = []
    while True:
        clickedPoint = win.getMouse()

        if startB.isClicked(clickedPoint):
            points = []
            continue

        if stopB.isClicked(clickedPoint):
            poly = Polygon(points)
            poly.setFill("lightblue")
            poly.draw(win)
            points = []
            continue

        points.append(clickedPoint)

    win.close()

main()
We stopped here last time...
http://libjournal.uncg.edu/ijcp/article/view/249/116
Another Type of User Feedback for the Button…
```python
from time import sleep

class Button:
    """Implements a button, which contains a label (text), is rectangular (frame), and can be clicked (True) or not clicked."""
    def __init__(self, x1, y1, w, h, text):
        """constructor: pass (x,y) of top left corner, and width and height. Pass the text displayed in button."""
        p1 = Point( x1, y1 )
p2 = Point( x1+w, y1+h )
self.frame = Rectangle( p1, p2 )
self.frame.setFill( "white" )
self.label = Text(Point( x1+w//2, y1+h//2 ), text)
self.clicked = False

def draw( self, win ):
    """display button on window."""
    self.frame.draw( win )
    self.label.draw( win )

def isClicked( self, p ):
    """Checks if p is inside the frame of the button. Returns True if p inside frame, False otherwise. If p inside, button changes state and color."""
    x1, y1 = self.frame.getP1().getX(), self.frame.getP1().getY()
    x2, y2 = self.frame.getP2().getX(), self.frame.getP2().getY()

    if x1 <= p.getX() <= x2 and y1 <= p.getY() <= y2:
        self.clicked = not self.clicked
        self.frame.setFill( "red" )
        sleep(0.1)
        self.frame.setFill( "white" )
        return True
    else:
        return False
```
Program Structure

Documentation — Header

Widget Definitions (Classes + Methods)

Functions

Main

Create UI

Animation Loop
def savePolyToFile( poly, fileName ):
    """gets a polygon object and a file name, and stores the x, y coordinates of all the points to the file."""

def main():
    win = GraphWin( "Save Poly to File", WIDTH, HEIGHT )
    points = [ Point( 10, 10 ), Point( 100, 100 ), Point( 10, 100 ) ]
    poly = Polygon( points )
poly.setFill( "lightblue" )
poly.draw( win )
savePolyToFile( poly, "polygon.csv" )
    win.getMouse() 
    win.close()
Review The Assignment: Generating a CSV File Holding Map Elements

https://docs.google.com/a/smith.edu/document/d/19fregdyl0jgCCEKJhc9faUZqGyBIQRAJXkb-FeEE/edit?usp=sharing
What Do We Put in the CSV File?
What Do We Put in the CSV File?

- coordinates of corners of buildings
- ?
- ?
- ?
Today’s Assignment

• Decide on what the final map will show
• Buildings must be present
• Color-coded buildings
• Other items can be on the rendered map
• Crowd-sourced map
Lab 11
We stopped here last time…
Feedback on Lab 11 and CSV file

Review Homework 11

Merging data from files: Data is dirty

Assigning a Color to a Year

Creating an Aquarium with Fish moving around
Crowd-Sourced CSV File

• Make sure last names are included in file

• Do not worry about mistakes! Do not clean up the CSV file.

• Paste your program output, do not edit by hand!

• CSV will not be editable after tonight midnight.

• Make the dimensions of the graphic window the same as those of the map!
• Decide and Define a **Precise** CSV Format
• Digitize map of Smith College
• Crowd-source the information in shared CSV file
• Each team contributes at least 5 map elements
Homework 11
Color Coding Buildings by Year of Construction

Python App
Questions


1710 Sessions House
1715 Drew Hall (cdo)
1810 Eleanor Duckett House
1810 Mary Ellen Chase House
1825 Capen Annex
1825 Capen House
...

• How should we store this information?

• How to find the date associated with Ford Hall?

• How to pick a color for Ford Hall?
A Simpler Example: Merging Two Files

movies.txt

Mickey Mouse, Mickey Mouse Clubhouse
Pluto, The Chain Gang
Minnie Mouse, Plane Crazy
Donald Duck, The Wise Little Hen

phones.txt

Sue Green, (413) 585 1122, single
Alex Marquis, (617) 512 1234, married
Bambi, single
Mickey Mouse, (212) 123 5598, married
Pluto, (212) 123 5598, single
Minnie Mouse, (212) 123 5598, married
Donald Duck, (617) 525 1212, single
Bambi, (209) 713 1139, single

Problem to solve:
List all Disney characters along with their area code.
## Color-Coding: an example

<table>
<thead>
<tr>
<th>color</th>
<th>date range</th>
<th>r, g, b</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1700-1799</td>
<td>215, 97, 1</td>
</tr>
<tr>
<td></td>
<td>1800-1899</td>
<td>241, 163, 64</td>
</tr>
<tr>
<td></td>
<td>1900-1999</td>
<td>253, 184, 99</td>
</tr>
<tr>
<td></td>
<td>2000-2099</td>
<td>254, 224, 144</td>
</tr>
</tbody>
</table>

**Problem:** Write a function in the console that returns the r,g,b values corresponding to a date (string or int)
Feedback on Lab 11 and CSV file

Review Homework 11

Merging data from files: Data is dirty

Assigning a Color to a Year

Creating an Aquarium with Fish moving around
Demo: Moving objects
Fish in an Aquarium...