autoAnim Development Notes commenced 03.03.14
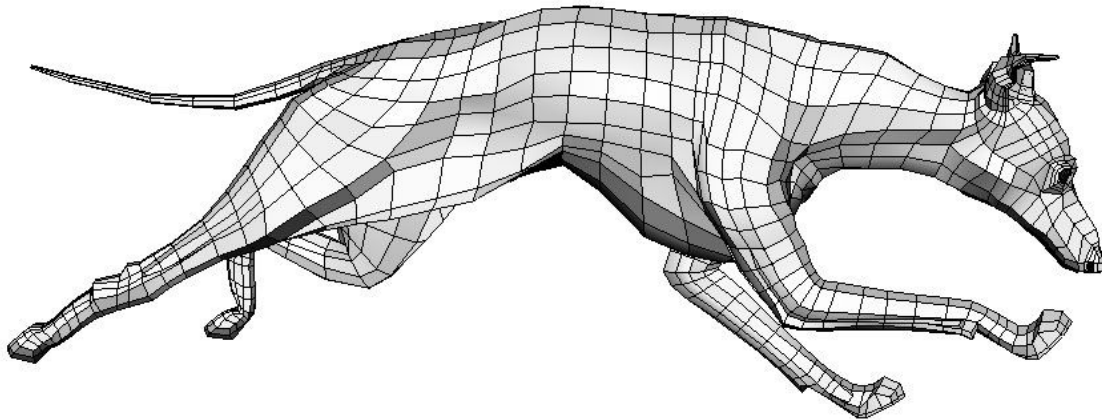
……….

28_04_14

i finished the autoanim interface good enough to use it and did a test with a whippet run cycle...below is a still from run cycle "autoAnimWhippet_008b.ma"
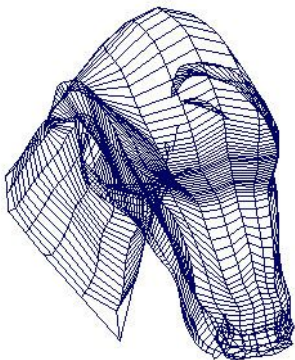

My conclusion on completion of this experiment is that the glitches annoy me… they are "glitches" not indications of "emergent content". They havent yet suggested to me meaning/ a way of proceeding… they are rather deviations from a correct run cycle….

HOW TO REMEDY THIS?

- maybe start with models and animations (ie movements) that are less standard/well-known/ clicheed. Ie start with dog forms (for example) and dog mobements that are not so well recognised; such as impressionistic rendition of a dog and maybe a movement such as fighting…

eg two dog forms could interact like in the table tennis film, "Dropp"
.I am wondering if it would look better by combining early whipppet experiments that I did with surfaces built from curves…(see image left from "Whippet Sketch" experiment???

……..

QUESTIONS for Shaun;

INHERITING FROM QWIDGET or QMAINWINDOW

Q.   when I change my code to inherit from QMainWindow instead of QWidget my layout gets stuffed up. Why is that? and how do I fix it?

A.   ---- inheriting from QMainWindow VS QWidget;

*apparently with QMainWindow, **you need to add a CentralWidget before adding GUI elements**.*

Q. on what occaisions do you need to import sip, and/or QtCore? I dont seem to need these for my scripts.

…………………...

PACKAGES AND MODULES

Q.   how to organise files/scripts?

Once the scripts get longer is it advantageous to organise them as separate documents so that one script file calls other modules?

A.   difference between a module and a package;

A **module** is a single file (eg. import myModule)

A **package** is a collection of modules in directories that give a package hierarchy

        eg. `from my_package.timing.danger.internets import function_of_love`

Documentation for modules

Introduction to packages   http://www.network-theory.co.uk/docs/pytut/Packages.html

Importing a package Python searches the **sys.path**…

SYS.PATH ⇒ is Initialized from the environment variable PYTHONPATH, plus an installation-dependent default

...heres a link where the guy talks about what to do if Python is not finding modules;

http://www.bdnyc.org/2012/09/17/editing-pythonpath-to-import-modules/

To add a path to the sys.path ⇒

```
import sys
sys.path.append("path/to/Modules")
print sys.path
```

I did this and added; **'C:\GINA\RESEARCH_laptop\PROJECT\SCRIPTS\Modules'**

Now in my **SCRIPTS** folder I have '**dev**' and '**Modules**'. dev will be all the development scripts and Modules will be all the completed scripts. as a script is superceded I will replace it and put the old one with date of supercention in the name.

PROBLEM importing --- I have a simple script that imports a file Modules\testProject\'test.py'...

when I press F2 and send the script to Maya I get the error; '**no module named testProject**'

when I press ctrl+b to execute in Sublime I get the error; "**No module named maya.cmds**"

is it a matter of pointing sublime to maya.cmds ? and pointing maya to my module in scripts path (ie. Maya Python path?

A. -- from Autodesk docs;

Adding items to your Python path

To add items to your path in Python, do one of the following:

1. Set PYTHONPATH in your `Maya.env` file, or in your environment before you run Maya
2. Append to `sys.path` in your `userSetup.py` or other script once Maya is running.

Here is an example of appending sys.path

```
import sys sys.path.append( '/Users/jdoe/maya/Scripts' )
```

So all I need to do is to run the same code that I ran in Sublime in Maya (I suspect this is the same as adding the path manually to the environment variables). I guess sys.path is relational to the software I run the sys.path.append from…

NB… Gina working with these imported files seems to be confusing because it seems to reference older files which makes it hard to test the changes I make. I keep having to rename the file I'm importing to truly test the new functionality. very confusing.

I think it is working as I expect, I just have to be careful with the way that it imports modules and stores them in

memory.

__init__.py file can be empty or can cntain initialisation code

IF __MAIN__()
maybe a related question… what does this mean?

…….
19_03_14
Amendments and Additions;
be good to have a button "select driver" and "select target"

Limitations;
if I build one node off another (so a driven becomes a driver) then I need to manually set the keys one at a time because …. or gina try adding the rotZ to the COG...?? Actually it seems to work fine!! Seems I just needed the COG rotZ value. I guess Maya must have a record of the key number perhaps? I'm not sure….but it seems that the keys are laid in the correct order (ie they build upon each other).
--- actually I think that was a fluke…. the results are erratic when I daisyChain the driver nodes. will try now to link all to one node…. might make that node an "external" one… ie. a piece of geometry or a group….
The way that its set up the driver is something with values and keyframes… What does this means??
    that it cant be a noise texture or something….
    that driver could be a ramp
    driver could be an existing animation (ie something concieved of separately or a "found object".
Im thinking how relevant this enquiry is to "Dropp" animation.

Evaluation;
I am enjoying connecting all to one central (and external) node. However the issue of adding extra keys and using time offset (as a fractional number less than 1) is confusing I guess because when I add another key it changes the "get next key" function and all the keys get shuffled around.
-- I just realised that I could add keys to the original driver node… or I could have a type of two tiered driver system...

Thoughts;
wondering how to transport the keys onto another rig (ie other nodes).
- open text files and change one node name for another…. I could make a little helper function to open files and change the text…
    - "autoAnimWhippet_008.ma" layers controls…. is it going to be more interesting to start with complexity????
…….
18_03_14
WAS going well but seems to be a problem setting keys from default files….

Python Strings-
This link http://stackoverflow.com/questions/1228299/change-one-character-in-a-string-in-python
says **work with strings as lists** until you have no choice but to turn them into strings

glitches to fix ⇒ done
"apply default values"; gina I needed to type .'txt' at the end…
things to addr ⇒ done

duplicate tab
 fill in fileName and folderName for save defaults…
save all values

TESTING…
        "GINGER" file has no expressions on neck…
testing going well… fun…. but I cant seem to get the right **timing for the COG.ty….**

THOUGHTS…..
I'm still not sure how to save iterations of the animation. Some ideas;…
- save the file iteratively as I work on it and then combine them somehow...

…….
17_03_14
AutoAnimDev_041.py ⇒ is looking good :))
To do today;
        use tangent in and out
        change Ref keys to correspond with keys
        make tangent in and out combo boxes
how to set the comboBox as it was saved??? do I use setCurrentIndex()??
A. seems I have to use findText() first. this returns an index. then I use setCurrentIndex().
        fill in the defaults file name and folder name for tabs from files
        add the anim expressions tab page to main window (should this be in a different file?)
-- make new tab the current one?
It uses setCurrentWidget().... [not sure if I need currentIndex()]

-- could inherit from QMainWindow and add help menus
--?? I could try putting the utils in a separate file…
        and putting AutoAnimPage in a separate file….
--?? check out Maya script jobs
?? error checking

QUESTIONS
I'm just wondering what happens when you set one node against another…. (ie not all refering back to one central node)... I'm thinking what happens might be glitches….

TESTING
glitches to fix ⇒
--- "apply default values"; gina I needed to type .'txt' at the end…
things to add / consider ⇒
--- duplicate tab (do so without target)

…….
14_03_14
TO FIX
Ref Keys to correspond with key numbers
for "save defaults"; only add "\" if there is a folder entered

HOW to have the text in a line edit so that it is just placeholder and disappears as soon as user clicks in the box??
A. ? **setPlaceholderText**

….
CREATE TABS FROM FILES has to be a separate class or function because it goes in the main window.
SAVE and APPLY DEFAULTS is on each tab.
can I make a separate class that saves default files and reads default files?
How would it "plug in" to my UI? how would I connect it to buttons?
        For the moment it seems much easier to do it all in one file….
maybe later I will try to separate out the utility functions into another file (including Qt utils)
…………...

Today I am wondering how I can organise my scripts so that they call each other.
Perhaps I will test this as I implement the next phase of my AutoAnim script which is to write and read files
(default value files).
to do;
recap functionality of the script;
        what can be inputs so that the code is reusable (eg; filePath)
do simple test calling a script, making an instance of a class and calling a function on that class.

Seems that my animation tools could be designed as a **package**…
It would be amazing if I could have the code reusable so that I could use PyQt or maya.cmds to build the UI… but
at this stage I think this is too much to ask.
A TENTATIVE STRUCTURE;

AnimationTools/	top level package
__init__.py	initialise the AnimationTools package
AutoKeyframe/	subpackages for automatic keyframe tools
__init__.py	
saveLoadDefaults.py	
AnimExpressions/	subpackages for animation expression tools
__init__.py	
AnimExpressionsTab.py	
AnimToolsUI/	
__init__.py	
AnimToolsMainUI.py	
ModellingTools/	top level package
__init__.py	initialise the ModellingTools package
TexturingTools/	top level package
__init__.py	initialise the TexturingTools package
RiggingTools/	top level package
__init__.py	initialise the RiggingTools package
Utilities/	top level package
__init__.py	initialise the Utilities package
userInterface.py	(user interface templates; dynamic tab setup etc)

…….
13_03_14
Trying to decipher what my keyframe code does…
wondering about tools and strategies for designing software…
thinking about going back to square one…

createNewDriverKeyList seems to be working. Now test **calulateKeyTime;**
and **calculateNextKeyTime** ....

setTargetKeys()
need to incorporate;
        valueOffset
        inTangent
        outTangent

"dynamicUItest_031.py" - seems to be working …

NOW;
        apply default values
        save default values
        create tabs from files
GINA it would be very cool if I could do these using classes or even separate files (packages? modules?).
Basically if I could do them in a way that makes it easy to keep track of them and also to reuse them.
        Fix interface issues;
where do I use "parent = self"
Make interface collapse when group boxes are unchecked
Driver and Target cylcle length QHBoxlayout jumps around (up and down).

Maybe add help docs??
A. *it seems that I cant add a menu bar. Perhaps its because I am inheriting from QWidget and not QMainWindow.*
        eg the file path where default values are stored
        the fact that time offset is entered as a fraction (greater than 0 and less than 1)
        Tab Names -- if a node and channel are selected the new tab (or the new tab name for current tab) will be
named as follows, "node.channel". If nothing is selected the tab name will be based on user input. If there is no
user input and nothing selected the tab will be named "tab*n*" (where *n* = the number of tabs).
Maybe add error messages??
        eg when timeOffset is greater than 0 or less than 1

DEFAULTS --
path I use to store defaults;
projectDirectory/data/autoAnim…
default text files must be collected into a folder in order to use them to create tabs
…….
12_03_14
COMBINE **keyframeTest_009** with **DynamicUItest_028**..

HOW does **keyframeTest_009** work?
At the moment I have written it as a class. Should it be written as functions rather than a class? How do I
incorporate it as a class?

hard coded **driver** and **target** (node and channel),
and also **driverKeyLoopLen** and **targetKeyLoopLen**…

makeKeyDataList defines a list of the multiplier and key attributes etc. Replace this with accessors that retrieve

user input (6 values per key).
the list will contain as many lists as there are keys on the driver …
each list (ie each index) in the **keydataList** has 6 members, ie [Ref keys,TimeOffset, ValueMult, ValueOffset, inTangent, outTangent],

getRefKey (new name for getDriveIndexNum) .this function gets the driver key (ie it gets the driver keys position in the driver loop).
It returns a list of driver keys. Ie for each key in the targetkeyLoop it returns a list of which driver key to refer to

getTimeOffset and **getValueMult** are both similar.
Should I combine these functions so that they return all 6? or make one standard function and you enter the index?

createNewDriverKeyList =
gets a **list of all the keys on the driver node**
splits the list into lists of length of the driverKeyLoopLen
calculates **number of keys to lay** (on the target node)
returns a list of the driver keys, eg it might be something like [0,1,2,0,1,2, etc]
…
try to combine using **AutoKey()** class….
I'm thinking that it may be better not to use a class because I need to recalculate the key data list each time…

DICTIONARY
I'm thinking of creating a dictionary instead of a list...actually I dont think there's a lot of saving in that…. I think I will continue with lists for the moment ….
I could have done as follows ;
ZIP two lists together to create a dictionary………..
keyList = list of keys
dataLists = list of data lists
D = dict(zip(keyList, dataLists))

...calculateKeyTime (timeOffset, keyIndex)

…….
11_03_14
FILE BROWSER
QFileDialog.getExistingDirectory
………..
```
file = str(QFileDialog.getExistingDirectory(self, "Select Directory")
```

…..
Gina; How to change the ViewMode? at the moment it takes up too much room. I just want a simple file browser...actually I just want an icon that launches a file browser to help choose a file path.

GOAL; to finish this script before next Monday (when I might be working at XYZ).
then to package as .exe so that user doesnt need pyQt (or explore using "PySide"?)

changing my group boxes to use my "createGroupBox" function. Problem I'm having is that the bottom one (tab

control) collapses the window but the higher ones dont. I will push on and come back to this...

....

09_03_14

READ THIS BOOK

http://natureofcode.com/book/introduction/   by Daniel Shiffman

HOW TO EXPAND GROUP BOX?

found this;

I have a checkable

QGroupBox, whose sole child is a QFrame with no borders. All the

widgets I put into the QFrame.

Then I connect the **toggled(bool) signal of the group box** to the frame's **setShown(bool) slot**. That way, the QFrame is hidden when the QGroupBox is un-checked. And you can do it

all from the Qt Designer: less hand-written code, yay!

HOW TO MAKE QFRAME a child of QGroupBox?

"Composite Widgets

When a widget is used as a container to group a number of child widgets, it is known as a composite widget. These can be

created by constructing a widget with the required visual properties - a QFrame, for example - and adding child widgets to it,

usually managed by a layout. The above diagram shows such a composite widget that was created using Qt Designer.

Composite widgets can also be created by subclassing a standard widget, such as QWidget or QFrame, and adding the

necessary layout and child widgets in the constructor of the subclass. Many of the examples provided with Qtuse this approach,

and it is also covered in the Qt Tutorials.

LAYOUT MANAGEMENT

I can get the frame to show and hide the widgets but the group box doesnt expand and shrink.

Is this link useful?   http://qt-project.org/doc/qt-4.8/layout.html

QSizePolic y	Layout attribute describing horizontal and vertical resizing policy

ADDING SQUASH and STRETCH?

addStretch(1)   ??

??.........Remove additional spacing

In order to remove the additional spacing while using QBoxLayout we can set

the margins as

layout->setContentsMargins(QMargins(0,0,0,0))

........when I make the window smaller (using setGeometry) the group box shrinks so I'm wondering if I set group box size??

How to add widgets to a frame?

" frame.setLayout(hBoxLayout)
  frame.setWindowTitle("QFrame Add Layout and Widgets")
  frame.show()

Seems you add widgets to a layout the set the layout attached to the frame.

also seems that you have to show the frame

HOW TO CONNECT A SIGNAL FROM A GROUP BOX???

-- the two signals are - toggled and checked.

I use toggled

IT WORKS to directly connect the GB.toggled to the Frame.setShown. However I am not immediately sure how to shrink the size of the GB when frame is not shown.

SIZE POLICY

```
QWidget.setSizePolicy(QtGui.QSizePolicy.Minimum, QtGui.QSizePolicy.Minimum)
```

or

```
QWidget::resize(rect().width(),100);
```

LOOPING OVER WIDGETS

how to determine if its a widget or a layout?

```
if type(item) == QtGui.QWidgetItem
```

...this seems to return the type ie QLineEdit etc. can also use isinstance as follows;

```
if isinstance(item, QLineEdit):
```

....

08_03_14

HOW TO CHANGE COLOUR OF A BUTTON?

```
testbutton.setStyleSheet('QPushButton {color: blue}')
```

....

07_03_14

-----------just ordered this book   Practical Maya Programming with Python

order: Order: PAC-14-1971486-1380339

https://www.packtpub.com/account

my password is-- research

....

HOW TO COLLAPSE A GROUP BOX??

To use a group Box;

Make widgets

make layout

addwidgets to layout

make group box and use groupBox.setlayout(layoutname)

....having trouble making it collapsable; is it a matter of parenting?

from here; http://pyqt.sourceforge.net/Docs/PyQt4/qvboxlayout.html

First, we create the widgets we want in the layout. Then, we create the QVBoxLayout object and add the widgets into the layout. Finally, we call

QWidget.setLayout() to install the QVBoxLayout object onto the widget. At that point, the widgets in the layout are reparented to have window as their parent.

You can align the items to the top. Also you can play with making your
>> expanded widgets size policy set to mininumExpanding
-----size hint
----paintEvent

all working well.Now I just want to bring my tabs test and my dynamic UI together. I might actually make it with all the same functionality as my maya.cmds UI.
---- rename tab
--maybe try collapsable group boxes; could have one for default value ands, one for key table.
- maybe file/folder browser for default value files
- eventually I would like to use scriptJobs to save iterations of the animation

INHERIT FROM QWIDGET??
Q. I will start by working out why my window doesnt show if I inherit from QWidget instead of QDialog…
A. I now have it simple and inheriting from QWidget.
…….
06_03_14
from yesterday; "dynamicUItest_008.py" seems to be working...now I just have to work out how to add tabs and how to access each text box.

so I am now trying to;
access the layouts in a list
access the widgets in a layout
        this might use children(), or count()

Widgets and Layouts info--- http://qt-project.org/doc/qt-4.8/widgets-and-layouts.html
maybe I need to use a "groupBox" widget? it seems that this is an "organiser widget"
so instead of each column being a Layout, it could be a group box. Would this help me to access the widgets in the group box?

from http://stackoverflow.com/questions/1781173/pyqt-removechild-addchild-qgroupbox
"I don't think calling removeWidget is necessary. Try just calling **widget.deleteLater** on whatever you want to delete. Then when you want to add it back, recreate it and use **layout.insertWidget** to put it in its proper place. Does that work?"

DELETING THE GROUP BOX
---changing my create keys columnLayout to creating a group box breaks the way I was deleting the layout ---
guess I need to work out how to delete the widget ---
Gina it looks like I can use deleteLater on a groupBox………...
widget.group_box.deleteLater()
widget.group_box = None

GETTING THE KEY VALUES
looks like this lists all the widgets in the group box (NB. the first on is the QVBoxLayout); GroupBox.children()
… wondering about this documentation; does it mean I could use "findChild" and enter the name of the child (which would be the name of the keyAttribute) ---
QObject **findChild** (*self*, type *type*, QString *name* = QString())

dynamicUItest_011.py is working well.

Now I want to work out how to;

----------delete groupBox widgets from keys layout (when columns need to be deleted). dynamicUItest_014.py does this

use tabs so that each tab returns the correct data (as per my last example using maya.cmds)

Create an "update all" button

USING TAB WIDGET

from: http://qt-project.org/doc/qt-4.8/qtabwidget.html#details

The normal way to use QTabWidget is to do the following:

1. Create a QTabWidget.
2. Create a QWidget for each of the pages in the tab dialog, but do not specify parent widgets for them.
3. Insert child widgets into the page widget, using layouts to position them as normal.
4. Call addTab() or insertTab() to put the page widgets into the tab widget, giving each tab a suitable label with an optional keyboard shortcut.

 A tab and its associated page can be removed with removeTab().

Below is the simplest tab test;

```
class MyTabWindow(qg.QWidget):
    def __init__(self):
        qg.QWidget.__init__(self)
        # set geometry
        self.setGeometry(250, 150, 400, 300)
        #set window title
        self.setWindowTitle('Tab Test')

        tabWidget = qg.QTabWidget()
        tab1 = qg.QTabWidget()
        tab2 = qg.QTabWidget()

        tabWidget.addTab(tab1, 'tab1')
        tabWidget.addTab(tab2, 'tab2')

        #layout manager
        vBox = qg.QVBoxLayout()
        vBox.addWidget(tabWidget)
        self.setLayout(vBox)
window = MyTabWindow()
window.show()
```

tabTest_03.py is goingg well… wondering how to delete tab

do I have delete tab button in main window and it gets active tab?

or delete tab button on the tab window?? might be better in main window next to delete tab…

HOW TO DELETE A TAB so that it no longer exists? I can delete it from teh tabWidget but it still exists or do I just need to dremove it from my list?? I just removed it...seems to work :)

tabTest_03.py seems good

…….

05_03_14

from yesterday;

I SEEM TO HAVE found a workaround for the QLineEdit SIGNAL which is to use "returnPressed" as in the following format,

self.inText.returnPressed.connect(self.pushedButton)

this reference was helpful; http://pyqt.sourceforge.net/Docs/PyQt4/qlineedit.html

to continue...i have changed from using textChanged to returnPressed and it seems to work. I'm now thinking that I start with two keys in loop (ie. 2 key rows) and then add key rows....or do I just rebuild?

HOW to add command with arguments in PyQt?
a maya button command is something like this;
command=(partial(self.populateTextField, self.textField_Driver)
def populateTextField(self, textField, *args):

HOW to add an item to the layout and maybe delete an item from the layout?
useful on deleting -- http://stackoverflow.com/questions/4528347/clear-all-widgets-in-a-layout-in-pyqt
You can use the `close()` method of `widget`:
```
for i in range(layout.count()): layout.itemAt(i).widget().close()
```

Or I could use a grid layout and use the addWidget() method described here;
http://zetcode.com/gui/pyqt4/layoutmanagement/

"*layout.count()*" looks useful… and "*layout.takeAt(index)*"
GINA be aware that removing a widget from a layout does not delete it, it just isnt visible cause its not laid out…
You might need to use `widget.setParent(None)`

this looks useful;
http://stackoverflow.com/questions/9374063/pyqt4-remove-widgets-and-layout-as-well
seems to give two solutions;
`this WORKS;`

```
    def clearLayout(self, layout):

        while layout.count():

            item = layout.takeAt(0)

            widget = item.widget()

            if widget is not None:

                widget.deleteLater()

            else:

                self.clearLayout(item.layout())
```

YAY!!!; "dynamicUItest_008.py" seems to be working
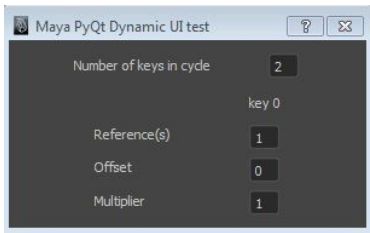now I just have to work out how to add tabs and how to access each text box

……...
doing some study on the API from AU Masterclasses. Link provided by Gerardo.
http://area.autodesk.com/masterclasses/masterclass/class2_q3_2012_kristine_middlemiss
My notes from re this video lecture are here;

………
04_03_14

I got this far...but its not happening dynamically… will go back to the tute below…
maybe just get something to update when No of keys is changed………
"Every widget emits signals when it's updated in some way. We need to connect to those signals so that we know when the user has changed the name or shape type. Let's use the *connect* method to do just that.
The arguments passed to *connect* are the following (in order):
- The widget emitting the signal.
- The signal being emitted. Each widget is capable of emitting many different signals so we need to specify the one that gets emitted when the condition we're interested in occurs. For instance, the signal for nameLE is "textChanged", which as the name suggests is emitted whenever the text gets changed.
- The function/method that gets called every time the signal is emitted. In this case, we're providing our *updateDescription* method.

Got a version to update one lineEdit when the other is edited ---- "dynamicUItest_temp.py" (in week08 folder)
--now add widgets for each number "dynamicUItest_temp_02.py"
I will now try to implement this in "dynamicUItest_003.py"
……….
PROBLEM == QLineEdit SIGNAL crashes Maya 2013--------
I did a quick Google search and found this;
For windows users, PyQt 4.9.1 built against Qt4.7.1 and SIP4.13.2 for Maya2013 x64, can be downloaded here .
Links to the respective sources are included below.
Update: Have updated an executable to make the installation easier. You may download it here
Qt 4.7.1 source
SIP source
PyQt source
from here;
http://codecg.com/2012/04/15/pyqt4-for-maya2013-on-windows-7-x64/
….
To clarify what I have installed;
Python 2.6.4
Maya 2013
etc

I SEEM TO HAVE found a workaround for the QLineEdit SIGNAL which is to use "returnPressed" as in the following format,
self.inText.returnPressed.connect(self.pushedButton)
this reference was helpful;
http://pyqt.sourceforge.net/Docs/PyQt4/qlineedit.html

LATER I need to separate my code into __build__ functions etc as Shaun has it.

………
03_03_14

seems I am pursuing auto anim tools on a few levels;
  rebuilding the window (tabs etc) with **PyQt** - this might apparently give me more options for interactively or procedurally generating the UI (eg. I might be able to get the number of keys in the loop to generate a certain number of input boxes.
  working out how to **iterate over all the keys**
  working out how to get the **tabs working properly** with Maya cmds - I seem to have pretty much worked this out. Although I could use the Maya API to get the long name of the autoAnimTab instance…
  - optional is to try using **XML** for reading and writing presets - this would probably involve writing (or using) the read XML class that Shaun wrote in the intermediate course.

GENERAL POINTS…
I have been having trouble getting Sublime Text setup so that it will auto complete. I think I have auto complete now working for Python code. I also have Qt able to execute directly from sublime. Also have sendToMaya working and cntrl+B executes python code. I think I might leave it at that because I keep breaking things when I try for more functionality. But ideally I would like;
  autocomplete for maya cmds (strangely I had this for a short while then it stopped working)
  autocomplete for PyQt

TO DO…
make PyQt UI in designer
  save file for Shaun so he can recreate it
  try recreating it by writing Python code - this will entail writing "widgets" so that it can procedurally generate boxes etc.

…….starting by doing this tutorial - http://danostrov.com/2012/10/27/creating-a-simple-ui-in-maya-using-pyqt/