Environmental Footprint Calculator for Poultry Producers GUI
Functional Specifications, April 2016

1. PROJECT GOALS / OVERVIEW

The objective of this project is to develop a Graphical User Interface (GUI) around a model that simulates the environmental impacts of poultry production. The GUI is being written in Java (Swing components) while the calculator will be developed in C. The GUI takes input from the user, sends it to the calculator, and then displays output received from the calculator.

2. SYSTEM ARCHITECTURE

PoultryDemo.java creates the initial instances of the frames and panels, and within these creation methods further methods are called from *loadInputMethods.java* to populate them.

IOClass.java is a custom class that reads/saves to xml file format to/from the variables of the UI.

Calculator_Call.java is a placeholder that is called when the 'run' button is pressed. It finds which operating system is being used (Windowns, mac, linux/unix) and then executes a temporary C++ executable (which will eventually be the calculator executable).

File Name	***Description***	***Methods() : return type***
PoultryDemo.java	Main class Component creation	createToolBar : JToolBar createMenuBar : JMenuBar createAboutMenu : void createViewMenu: void createEditMenu : void createFileMenu : void createWastePanel : JTabbedPane createBarnPanel : JTabbedPane createBarnPanel : JTabbedPane createFeedPanel : JTabbedPane createBirdPanel : JTabbedPane createHomePane : JDesktopPane createHomeFrame : void

		createDesktopPane : JDesktopPane
Calculator_Call.java	Method for running an external process (.exe)	main : void output : String isWindows: bool isMac : bool isUnix : bool
loadInputMethods.java	Population methods for tabs in tabbed panes	loadBirdDataPanel : void loadFeedIngredPanel : void loadFeedShippingPanel : void loadBarnLocSaizePanel : void loadBarnHeatCoolPanel : void loadBarnWater : void loadBarnLighting : void loadWastePanel : void
IOclass.java	References all input components for saving/loading from file	addinput : void loadinputs : void saveinputs : void
KeyEvent.java	Utility class for keyboard input	getKeyCodeForChar(char) : int getTypeString(int) : String
/resources/*.png	Icon files for buttons 32x32 png	--

The GUI has three main components contained in the encompassing frame window *topFrame*. They are the main desktop pane *desktopPane,* the menu bar *topMenuBar,* and the tool bar *topToolBar.*
Panels displayed on *desktopPane* are switched using the buttons in *topToolBar. topMenuBar* contains shortcuts to file saving, loading, as well as future features not yet implemented.

The current build has the following visual structure of Java Swing componets (javax.swing.*). User input components (text fields, checkboxes, etc.), are sent to the *IOclass* for use in file input/output. The *IOclass* keeps arraylists of inputs based on their type, i.e. ArrayList<JTextField>. *IOclass* uses these to load/save from/to xml files.

Visual Layout Components

Component Name	*Component Type*	*Contained In*	*Creation Method Layout Type*
PoultryDemo()			
t**opFrame**	JFrame	PoultryDemo class	PoultryDemo construct BorderLayout
desktopPane	JDesktopPane	topFrame	createDesktopPane() CardLayout
topMenuBar	JMenuBar		createMenuBar()
topToolBar	JToolBar		createToolBar()
createHomePane()			
homePane	JDesktopPane	desktopPane	createHomePane()
createBirdPanel()			
birdPanel	JTabbedPane	desktopPane	createBirdPanel() FlowLayout
birdDataPanel	JPanel	birdPanel	loadBirdDataPanel() GroupLayout
birdBreedLabel breedInputBox	JLabel JComboBox<String>	birdDataPanel	
targetWeightLabel targetWeightField	JLabel JTextField		
numBroilersLabel numBroilersField			

numFatalitiesLabel numFatalititesField			
Component Name	***Component Type***	***Contained In***	***Creation Method Layout Type***
createFeedPanel()			
feedPanel	JTabbedPane	desktopPane	createFeedPanel() FlowLayout
feedIngredientsPanel	JPanel	feedPanel	loadIngredPanel() GroupLayout
numPhasesLabel numPhasesField	JLabel JTextField	feedIngredientsPanel	
phaseNameLabel phaseNameField			
numDaysPerPhaseLabel numDaysPerPhaseField			
feedShippingPanel	JPanel	feedPanel	loadFeedShippingPanel() GroupLayout
feedDistanceLabel feedDistanceField	JLabel JTextField	feedShippingPanel	
feedMassDelLabel feedMassDelField			
Component Name	***Component Type***	***Contained In***	***Creation Method Layout Type***
createBarnPanel()			
barnPanel	JTabbedPane	desktopPane	createBarnPanel()

BarnLocationSize	JPanel	barnPanel	loadBarnLocSizePanel() GroupLayout
barnLocationState barnStateInputBox	JLabel JComboBox<String>	BarnLocationSize	
barnLocationCounty barnCountyInputBox	JLabel JComboBox<String>		
barnLength barnLengthField	JLabel JTextField		
barnWidth barnWidthField			
barnHeight barnHeightField			
BarnHeatCool	JPanel	barnPanel	loadBarnHeatCoolPanel() FlowLayout
SideFanAmt SideFanAmtField	JLabel JTextField	BarnHeatCool	
SideFanThroughput SideFanThroughField			
SideFanPower SideFanPowerField			
TunnelFanAmt TunnelFanAmtField			
TunnelFanThrough hput			

...ThroughputField			
TunnelFanPower TunnelFanPowerField			
HeatingFuel HeatingFuelDrop	JLabel JComboBox<String>		
CoolFanUsed CoolFanCheck	JLabel JCheckBox		
CellTotalArea CellAreaField	JLabel JTextField		
SprinklersUsed SprinklerCheck	JLabel JCheckBox		
BarnWater	JPanel	barnPanel	loadBarnWater() GroupLayout
WellAmount WellAmountField	JLabel JTextField	BarnWater	
PipedAmount PipedAmountField			
SurfaceWaterAmount SurfaceWaterField			
WaterPumpPower WaterPumpField			
MaxFlowrate FlowrateField			
BarnLighting	JPanel	barnPanel	loadBarnLighting() GroupLayout
ConstantLight	JLabel JTextField	BarnLighting	

ConstantLightField			
PartialLight PartialLightField			
TotalTime TotalTimeField			
Component Name	***Component Type***	***Contained In***	***Creation Method Layout Type***
createWastePanel()			
wastePanel	JTabbedPane	desktopPane	createWastePanel() GroupLayout
wasteData	JPanel	wastePanel	loadWastePanel() GroupLayout
LitterUse LitterUseDrop	JLabel JComboBox<String>	wasteData	
LitterCleanout LitterCleanoutField	JLabel JTextField		
createMenuBar()			
mainMenuFile	JMenu	topMenuBar	createFileMenu()
mainMenuEdit			createEditMenu()
mainMenuView			createViewMenu()
mainMenuAbout			createAboutMenu()
createToolBar()			

home button *home.png*	JButton	topToolBar	
bird button *bird.png*			
feed button *feed.png*			
barn button *barn.png*			
waste button *waste.png*			
help button *help.png*			
run button *run.png*			

3. FURTHER FUNCTIONALITY SPECS
4. Platforms / versions / document format