

HW4 – Life Design Diagram

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LifeWindow		
Variables	Methods	Description
Ui::LifeWindow *ui		
QGraphicsScene *cellScene		the scene used for our cells
QGraphicsScene * barScene		the scene used for the bar graph
Qtimer *timer		the timer used on our play, pause, and speed buttons
Cell *cells[10][20]		a 2D-array of pointers to cells
int cellHeight_		the cell height of each cell
int cellWidth_		the cell width of each cell
int barWidth_		the bar width of the bars in the bar graph
int turn_		the number of turns taken
int population)		the current population of cells
double speed_		the current speed of the program
doublebars_[20]		an array of integers of the bars
	void populate()	populates the cell view and cells_ variable with random colors 50%
		increases the turn count and

	<code>void IncreaseTurn()</code>	increases the turn count and updates it in the view
	<code>void TakeTurn()</code>	takes a turn, counts the number of neighbors, and adjusts the cells colors accordingly. Updates the bar graph as well
	<code>void GenerateBars()</code>	updates the bar graphs based on the population
	<code>void RepaintCells()</code>	repaints the red cells as blue cells
	<code>int CountNeighbors(int l, int j)</code>	count the number of live neighbors a cell has
	<code>bool IsAlive(int l, int j)</code>	checks the color of a cell to see if it's alive
	<code>void changePopulation(int x)</code>	change the population
	<code>void on_newSampleButton_clicked();</code>	slot for when the new sample button is clicked
	<code>void on_stepButton_clicked();</code>	slot for when the step button is clicked
	<code>void on_stepButton_clicked();</code>	slot for when the step button is clicked
	<code>void on_speedSlider_valueChanged(int value);</code>	slot for when speed slider is changed
	<code>void on_playButton_clicked();</code>	slot for when play button is clicked
	<code>void on_pauseButton_clicked();</code>	slot for when pause button is clicked
	<code>void RightClickSlot(Cell *c)</code>	slot for when a cell is right clicked
	<code>void LeftClickSlot(Cell * c);</code>	slot for when a cell is left clicked

Cells		
Variables	Methods	Description
QColor color_;		contains the color of the cell
int x_;		the row the cell is in
int y_;		the column the cell is in
int sceneWidth_;		where the cell starts width-wise
int sceneHeight_;		where the cell starts height-wise
	Cell(QColor color, int x, int y, int sceneWidth_, int sceneHeight_);	the constructor that takes a row, column, width, height, and color
	QRectF boundingRect() const override;	defines the outer bounds of the item as a rectangle
	QPainterPath shape() const override;	returns the item's clip path. The clip path contratins the items appearance and interaction
	void paint(QPainter *painter, const QStyleOptionGraphicsItem *item, QWidget *widget) override;	paint the cell when the update funciton is called
	void	
	void mousePressEvent(QGraphicsScene MouseEvent *event) override;	emits a signal based on the mouse press event on a cell
	QColor get_color();	get the color of a cell
	void set_color(QColor color);	set the color of a cell