Lab # 7 : City

ECE 118 – R/RC Lab on Wednesday at 5:05

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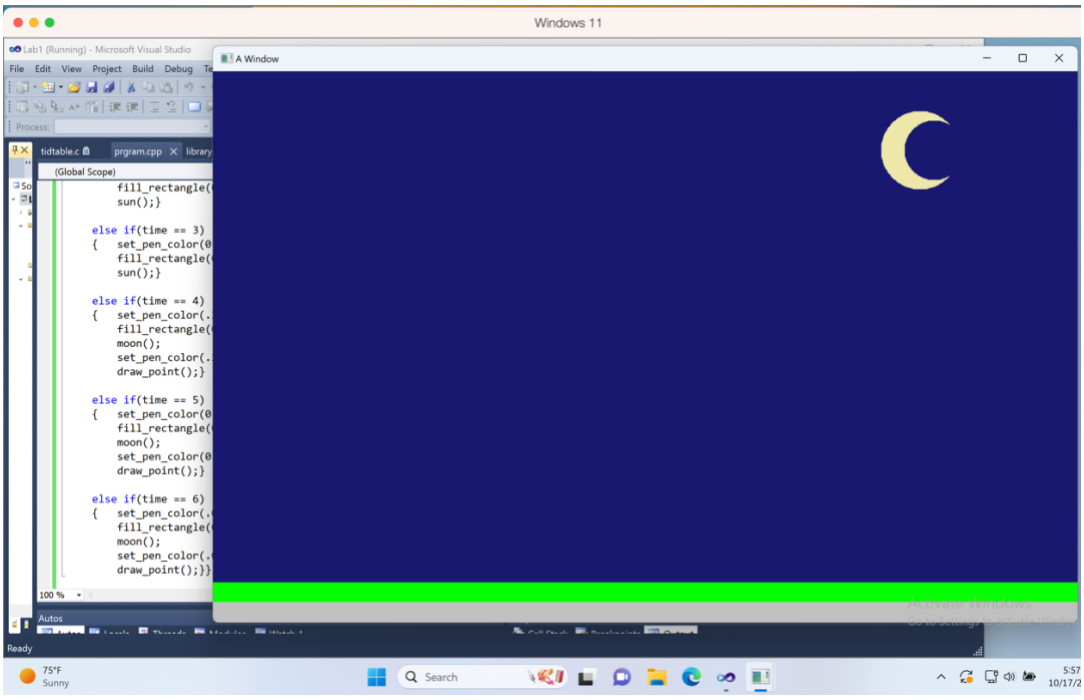
1. Background

```
#include "library.h"

void sun()
{     move_to(900, 100);
      set_pen_width(100);
      set_pen_color(1.0, .843, 0.0);
      draw_point(); }

void moon()
{     move_to(900, 100);
      set_pen_width(100);
      set_pen_color(.933, .9098, .666);
      draw_point();
      set_heading_degrees(90);
      move_distance(18);
      set_pen_width(76);}

void time_of_day()
{     int const time = random_in_range(0, 6);
      if(time == 0)
      {     set_pen_color(0.0, 0.0, 0.0);
            fill_rectangle(0, 0, 1200, 700);
            moon();
            set_pen_color(0.0, 0.0, 0.0);
            draw_point();}

      else if(time == 1)
      {     set_pen_color(.6, .8, 1.0);
            fill_rectangle(0, 0, 1200, 700);
            sun();}

      else if(time == 2)
      {     set_pen_color(.2, .6, 1.0);
            fill_rectangle(0, 0, 1200, 700);
            sun();}

      else if(time == 3)
      {     set_pen_color(0.0, .502, 1.0);
            fill_rectangle(0, 0, 1200, 700);
            sun();}

      else if(time == 4)
      {     set_pen_color(.2, .2, 1.0);
            fill_rectangle(0, 0, 1200, 700);
            moon();
```

```
            set_pen_color(.2, .2, 1.0);
            draw_point();}

      else if(time == 5)
      {     set_pen_color(0.0, 0.0, .4);
            fill_rectangle(0, 0, 1200, 700);
            moon();
            set_pen_color(0.0, 0.0, .4);
            draw_point();}

      else if(time == 6)
      {     set_pen_color(.098, .098, .4392);
            fill_rectangle(0, 0, 1200, 700);
            moon();
            set_pen_color(.098, .098, .4392);
            draw_point();}}

void grass()
{     set_pen_color(color :: green);
fill_rectangle(0, 650, 1200, 675); }

void road()
{     set_pen_color(color :: grey);
      fill_rectangle(0, 675, 1200, 700); }

void main()
{     make_window(1100,700);
      time_of_day();
      grass();
      road();}
```

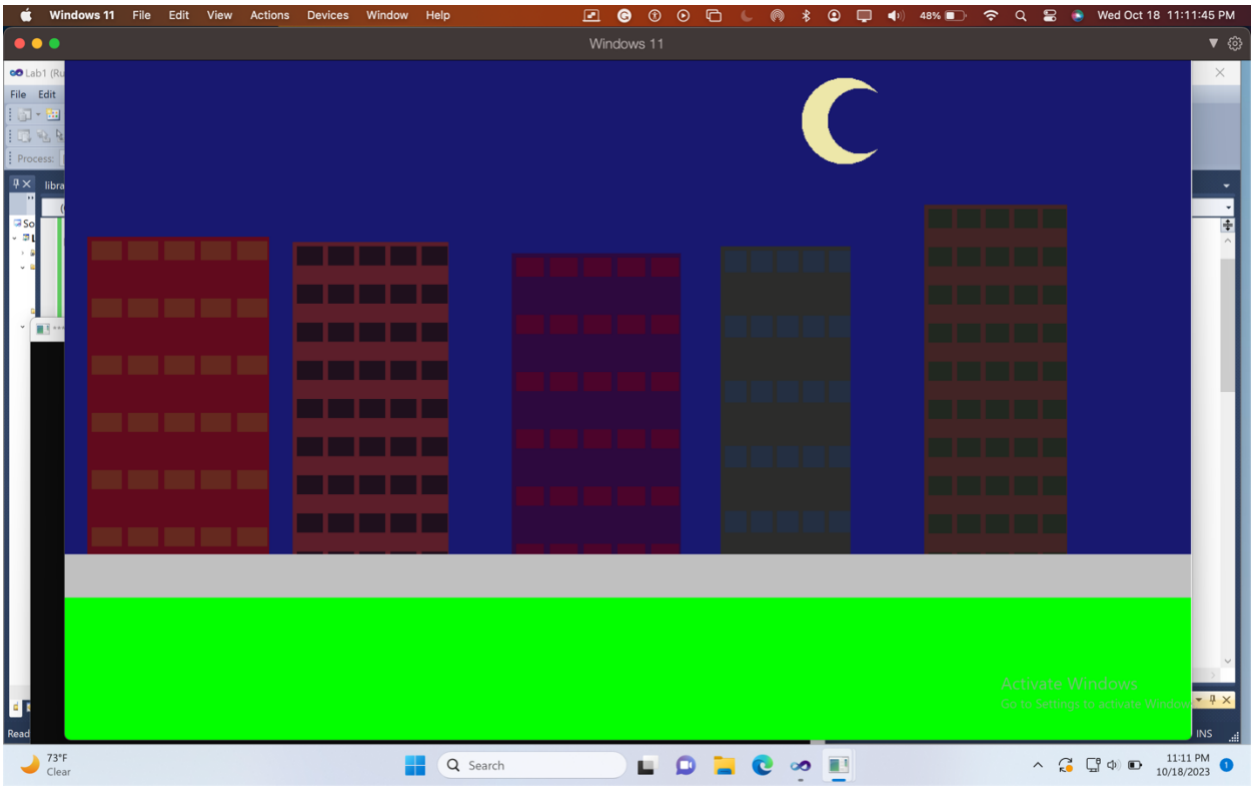


2. Office Buildings

```
#include "library.h"

void building_color()
{	int red = random_in_range(20, 102);
	int green = random_in_range(0, 50);
	int blue = random_in_range(20, 70);
	double r = red / 255.0;
	double g = green / 255.0;
	double b = blue / 255.0;
	set_pen_color(r, g, b);
}

void windows(int counts)
{	int height = random_in_range(10, 15);
	int width = random_in_range(10, 15);
	int x = random_in_range(15, 25);
	int y = random_in_range(300, 350);


	building_color();
	fill_rectangle(x-5, y-5, x+width*13+10, y+height*16+10);

	int random_space = random_in_range(2,5);
	building_color();
	while (counts <= 15)
	{	fill_rectangle(x, y+height*counts, x+width, y+height);
		fill_rectangle(x+width*3, y+height*counts, x+width, y+height);
		fill_rectangle(x+width*6, y+height*counts, x+width, y+height);
		fill_rectangle(x+width*9, y+height*counts, x+width, y+height);
		fill_rectangle(x+width*12, y+height*counts, x+width, y+height);
		counts = counts + random_space; }
}

void sun()
{	move_to(900, 100);
	set_pen_width(100);
	set_pen_color(1.0, .843, 0.0);
	draw_point(); }

void moon()
{	move_to(900, 100);
	set_pen_width(100);
	set_pen_color(.933, .9098, .666);
	draw_point();
	set_heading_degrees(90);
	move_distance(18);
	set_pen_width(76);}

void time_of_day()
{	int const time = random_in_range(0, 6);
```

```
	if(time == 0)
	{	set_pen_color(0.0, 0.0, 0.0);
		fill_rectangle(0, 0, 1200, 700);
		moon();
		set_pen_color(0.0, 0.0, 0.0);
		draw_point();}

	else if(time == 1)
	{	set_pen_color(.6, .8, 1.0);
		fill_rectangle(0, 0, 1200, 700);
		sun();}

	else if(time == 2)
	{	set_pen_color(.2, .6, 1.0);
		fill_rectangle(0, 0, 1200, 700);
		sun();}

	else if(time == 3)
	{	set_pen_color(0.0, .502, 1.0);
		fill_rectangle(0, 0, 1200, 700);
		sun();}

	else if(time == 4)
	{	set_pen_color(.2, .2, 1.0);
		fill_rectangle(0, 0, 1200, 700);
		moon();
		set_pen_color(.2, .2, 1.0);
		draw_point();}

	else if(time == 5)
	{	set_pen_color(0.0, 0.0, .4);
		fill_rectangle(0, 0, 1200, 700);
		moon();
		set_pen_color(0.0, 0.0, .4);
		draw_point();}

	else if(time == 6)
	{	set_pen_color(.098, .098, .4392);
		fill_rectangle(0, 0, 1200, 700);
		moon();
		set_pen_color(.098, .098, .4392);
		draw_point();}}

void grass()
{	set_pen_color(color :: green);
fill_rectangle(0, 650, 1200, 675); }

void road()
{	set_pen_color(color :: grey);
	fill_rectangle(0, 675, 1200, 700); }

void main()
```

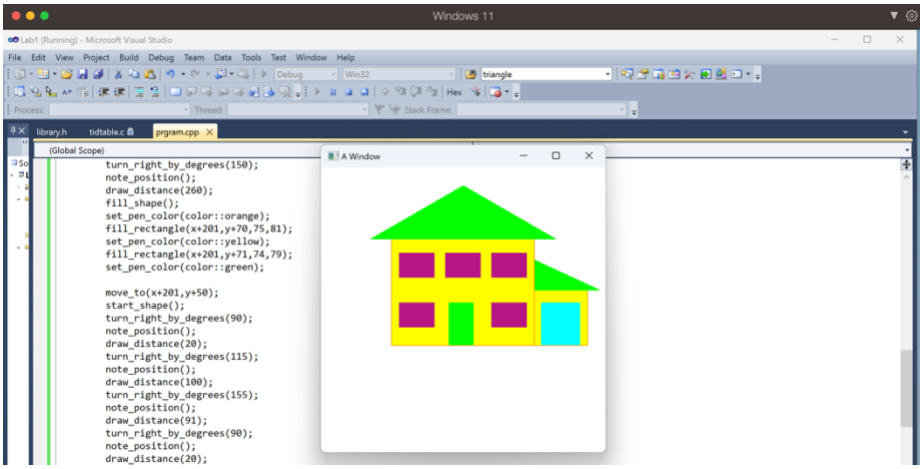
```
{       make_window(1100,700);
        time_of_day();
        windows(0);
        grass();
        road();}
```



3. Houses

```
#include "library.h"

void houses(const int x, const int y)
{	int house = random_in_range(1,2);

	if (house == 1)
	{	set_pen_color(color::orange);
		fill_rectangle(x-1,y-1,202,152);
		set_pen_color(color::yellow);
		fill_rectangle(x,y,200,150);
		set_pen_color(color::purple);
		fill_rectangle(x+10,y+20,50,35);
		fill_rectangle(x+75,y+20,50,35);
		fill_rectangle(x+140,y+20,50,35);
		fill_rectangle(x+10,y+90,50,35);
		fill_rectangle(x+140,y+90,50,35);
		set_pen_color(color::green);
		fill_rectangle(x+80,y+90,35,60);
		move_to(x-30,y);
		start_shape();
		turn_right_by_degrees(60);
		note_position();
		draw_distance(150);
		turn_right_by_degrees(60);
		note_position();
		draw_distance(150);
		turn_right_by_degrees(150);
		note_position();
		draw_distance(260);
		note_position();
		fill_shape(); }

	if(house == 2)
	{	set_pen_color(color::orange);
		fill_rectangle(x-1,y-1,202,152);
		set_pen_color(color::yellow);
		fill_rectangle(x,y,200,150);
		set_pen_color(color::purple);
		fill_rectangle(x+10,y+20,50,35);
		fill_rectangle(x+75,y+20,50,35);
		fill_rectangle(x+140,y+20,50,35);
		fill_rectangle(x+10,y+90,50,35);
		fill_rectangle(x+140,y+90,50,35);
		set_pen_color(color::green);
		fill_rectangle(x+80,y+90,35,60);
		move_to(x-30,y);
		start_shape();
		turn_right_by_degrees(60);
		note_position();
		draw_distance(150);
```

```
            turn_right_by_degrees(60);
            note_position();
            draw_distance(150);
            turn_right_by_degrees(150);
            note_position();
            draw_distance(260);
            fill_shape();
            set_pen_color(color::orange);
            fill_rectangle(x+201,y+70,75,81);
            set_pen_color(color::yellow);
            fill_rectangle(x+201,y+71,74,79);
            set_pen_color(color::green);

            move_to(x+201,y+50);
            start_shape();
            turn_right_by_degrees(90);
            note_position();
            draw_distance(20);
            turn_right_by_degrees(115);
            note_position();
            draw_distance(100);
            turn_right_by_degrees(155);
            note_position();
            draw_distance(91);
            turn_right_by_degrees(90);
            note_position();
            draw_distance(20);
            fill_shape();

            set_pen_color(color::cyan);
            fill_rectangle(x+210,y+90,55,60);
      }
}

void main()
{     make_window(400,400);
      houses(100,100); }
```



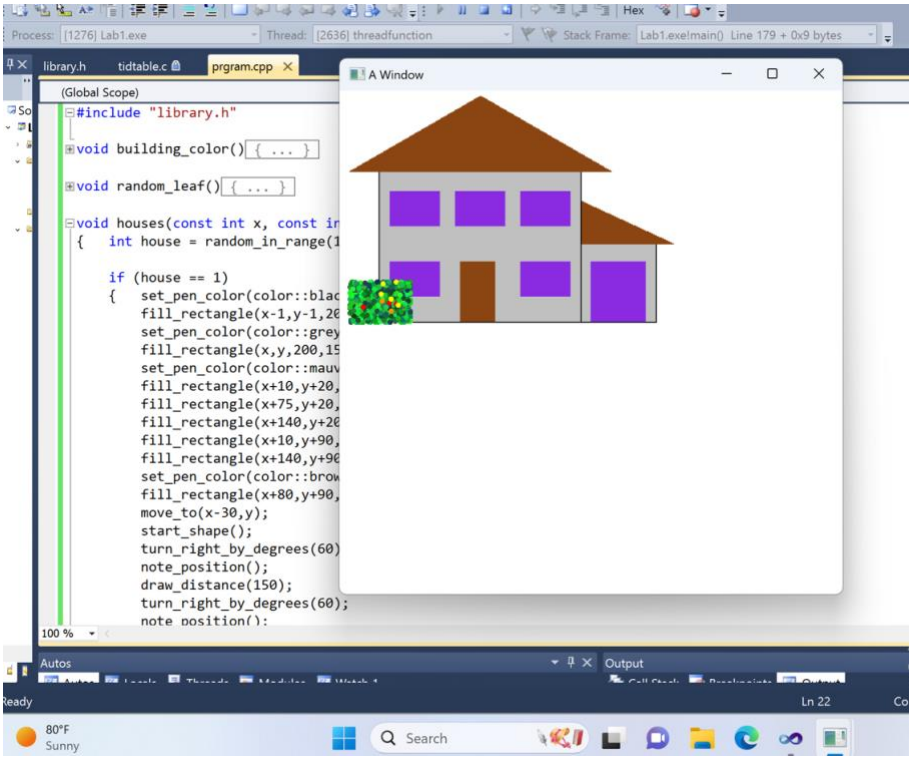
4. We Want A Shrubbery

```
#include "library.h"

void building_color()
{	int red = random_in_range(20, 102);
	int green = random_in_range(0, 50);
	int blue = random_in_range(20, 70);
	double r = red / 255.0;
	double g = green / 255.0;
	double b = blue / 255.0;
	set_pen_color(r, g, b);
}

void random_leaf()
{	int red= random_in_range(0,50);
	int green= random_in_range(50,255);
	int blue= random_in_range(20,102);
	double r= red/255.0;
	double g= green/255.0;
	double b= blue/255.0;
	set_pen_color(r,g,b);}

void houses(const int x, const int y)
{	int house = random_in_range(1,2);

	if (house == 1)
	{	set_pen_color(color::black);
		fill_rectangle(x-1,y-1,202,152);
		set_pen_color(color::grey);
		fill_rectangle(x,y,200,150);
		set_pen_color(color::mauve);
		fill_rectangle(x+10,y+20,50,35);
		fill_rectangle(x+75,y+20,50,35);
		fill_rectangle(x+140,y+20,50,35);
		fill_rectangle(x+10,y+90,50,35);
		fill_rectangle(x+140,y+90,50,35);
		set_pen_color(color::brown);
		fill_rectangle(x+80,y+90,35,60);
		move_to(x-30,y);
		start_shape();
		turn_right_by_degrees(60);
		note_position();
		draw_distance(150);
		turn_right_by_degrees(60);
		note_position();
		draw_distance(150);
		turn_right_by_degrees(150);
		note_position();
		draw_distance(260);
		note_position();
		fill_shape(); }
```

```
        if (house == 2)
        {       set_pen_color(color::black);
                fill_rectangle(x-1,y-1,202,152);
                set_pen_color(color::grey);
                fill_rectangle(x,y,200,150);
                set_pen_color(color::mauve);
                fill_rectangle(x+10,y+20,50,35);
                fill_rectangle(x+75,y+20,50,35);
                fill_rectangle(x+140,y+20,50,35);
                fill_rectangle(x+10,y+90,50,35);
                fill_rectangle(x+140,y+90,50,35);
                set_pen_color(color::brown);
                fill_rectangle(x+80,y+90,35,60);
                move_to(x-30,y);
                start_shape();
                turn_right_by_degrees(60);
                note_position();
                draw_distance(150);
                turn_right_by_degrees(60);
                note_position();
                draw_distance(150);
                turn_right_by_degrees(150);
                note_position();
                draw_distance(260);
                fill_shape();

                set_pen_color(color::black);
                fill_rectangle(x+201,y+70,75,81);
                set_pen_color(color::grey);
                fill_rectangle(x+201,y+71,74,79);
                set_pen_color(color::brown);

                move_to(x+201,y+50);
                start_shape();
                turn_right_by_degrees(90);
                note_position();
                draw_distance(20);
                turn_right_by_degrees(115);
                note_position();
                draw_distance(100);
                turn_right_by_degrees(155);
                note_position();
                draw_distance(91);
                turn_right_by_degrees(90);
                note_position();
                draw_distance(20);
                fill_shape();

                set_pen_color(color::mauve);
                fill_rectangle(x+210,y+90,55,60); }
}
```

```
void bushes(const int x, const int y)
{     int bush = random_in_range(1,2);

      if(bush == 1)
      {     int count = 1;
                  set_pen_width(5);
                  while(count <= 700)
                  {     int x1 = random_in_range(x+170, x+230);
                        int y1 = random_in_range(y+110, y+150);
                        random_leaf();
                        draw_point(x1,y1);
                        if(count > 690 && count <= 700)
                        {     int x2 = random_in_range(x+170, x+230);
                              int y2 = random_in_range(y+110, y+150);
                              int color = random_in_range(1,3);
                              if (color == 1)
                              {     set_pen_color(color::red);
                                    draw_point(x2,y2); }
                              if (color == 2)
                              {     set_pen_color(color::orange);
                                    draw_point(x2,y2); }
                              if (color == 3)
                              {     set_pen_color(color::yellow);
                                    draw_point(x2,y2); } }

                        count = count + 1; } }

      if(bush == 2)
      {     int count = 1;
            set_pen_width(5);
            while(count <= 700)
            {     int x1 = random_in_range(x+170, x+230);
                  int y1 = random_in_range(y+110, y+150);
                  random_leaf();
                  draw_point(x1,y1);
                  if(count > 690 && count <= 700)
                  {     int x2 = random_in_range(x+170, x+230);
                        int y2 = random_in_range(y+110, y+150);
                        int color = random_in_range(1,3);
                        if (color == 1)
                        {     set_pen_color(color::red);
                              draw_point(x2,y2); }
                        if (color == 2)
                        {     set_pen_color(color::orange);
                              draw_point(x2,y2); }
                        if (color == 3)
                        {     set_pen_color(color::yellow);
                              draw_point(x2,y2); } }

                  count = count + 1; } }
```

```
}

void main()
{      make_window(500,500);
       houses(40,80); }
```



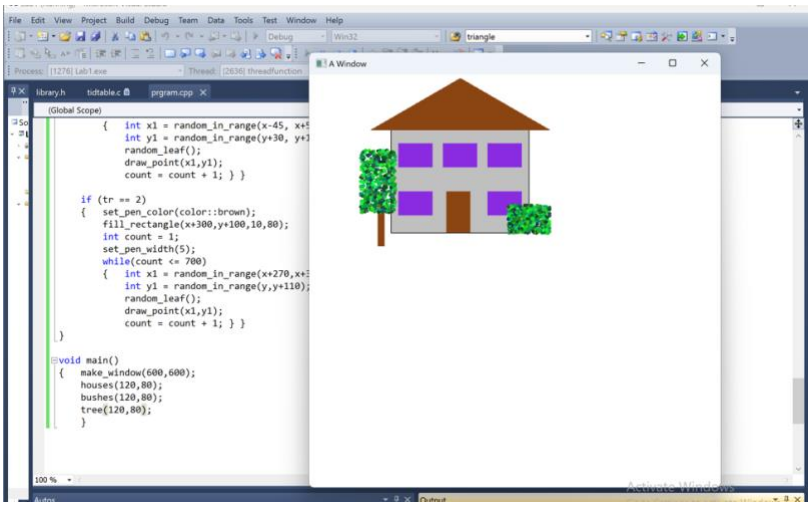
5. Trees Are Good Too.

```
#include "library.h"

void building_color()
{	int red = random_in_range(20, 102);
	int green = random_in_range(0, 50);
	int blue = random_in_range(20, 70);
	double r = red / 255.0;
	double g = green / 255.0;
	double b = blue / 255.0;
	set_pen_color(r, g, b);
}

void random_leaf()
{	int red= random_in_range(0,50);
	int green= random_in_range(50,255);
	int blue= random_in_range(20,102);
	double r= red/255.0;
	double g= green/255.0;
	double b= blue/255.0;
	set_pen_color(r,g,b);}

void houses(const int x, const int y)
{	int house = random_in_range(1,2);

	if (house == 1)
	{	set_pen_color(color::black);
		fill_rectangle(x-1,y-1,202,152);
		set_pen_color(color::grey);
		fill_rectangle(x,y,200,150);
		set_pen_color(color::mauve);
		fill_rectangle(x+10,y+20,50,35);
		fill_rectangle(x+75,y+20,50,35);
		fill_rectangle(x+140,y+20,50,35);
		fill_rectangle(x+10,y+90,50,35);
		fill_rectangle(x+140,y+90,50,35);
		set_pen_color(color::brown);
		fill_rectangle(x+80,y+90,35,60);
		move_to(x-30,y);
		start_shape();
		turn_right_by_degrees(60);
		note_position();
		draw_distance(150);
		turn_right_by_degrees(60);
		note_position();
		draw_distance(150);
		turn_right_by_degrees(150);
		note_position();
		draw_distance(260);
		note_position();
		fill_shape(); }
```

```
        if (house == 2)
        {       set_pen_color(color::black);
                fill_rectangle(x-1,y-1,202,152);
                set_pen_color(color::grey);
                fill_rectangle(x,y,200,150);
                set_pen_color(color::mauve);
                fill_rectangle(x+10,y+20,50,35);
                fill_rectangle(x+75,y+20,50,35);
                fill_rectangle(x+140,y+20,50,35);
                fill_rectangle(x+10,y+90,50,35);
                fill_rectangle(x+140,y+90,50,35);
                set_pen_color(color::brown);
                fill_rectangle(x+80,y+90,35,60);
                move_to(x-30,y);
                start_shape();
                turn_right_by_degrees(60);
                note_position();
                draw_distance(150);
                turn_right_by_degrees(60);
                note_position();
                draw_distance(150);
                turn_right_by_degrees(150);
                note_position();
                draw_distance(260);
                fill_shape();

                set_pen_color(color::black);
                fill_rectangle(x+201,y+70,75,81);
                set_pen_color(color::grey);
                fill_rectangle(x+201,y+71,74,79);
                set_pen_color(color::brown);

                move_to(x+201,y+50);
                start_shape();
                turn_right_by_degrees(90);
                note_position();
                draw_distance(20);
                turn_right_by_degrees(115);
                note_position();
                draw_distance(100);
                turn_right_by_degrees(155);
                note_position();
                draw_distance(91);
                turn_right_by_degrees(90);
                note_position();
                draw_distance(20);
                fill_shape();

                set_pen_color(color::mauve);
                fill_rectangle(x+210,y+90,55,60); }
}
```

```
void bushes(const int x, const int y)
{     int bush = random_in_range(1,2);

      if(bush == 1)
      {     int count = 1;
                  set_pen_width(5);
                  while(count <= 500)
                  {     int x1 = random_in_range(x+170, x+230);
                        int y1 = random_in_range(y+110, y+150);
                        random_leaf();
                        draw_point(x1,y1);
                        if(count > 690 && count <= 700)
                        {     int x2 = random_in_range(x+170, x+230);
                              int y2 = random_in_range(y+110, y+150);
                              int color = random_in_range(1,3);
                              if (color == 1)
                              {     set_pen_color(color::red);
                                    draw_point(x2,y2); }
                              if (color == 2)
                              {     set_pen_color(color::orange);
                                    draw_point(x2,y2); }
                              if (color == 3)
                              {     set_pen_color(color::yellow);
                                    draw_point(x2,y2); } }

                        count = count + 1; } }

      if(bush == 2)
      {     int count = 1;
            set_pen_width(5);
            while(count <= 500)
            {     int x1 = random_in_range(x+170, x+230);
                  int y1 = random_in_range(y+110, y+150);
                  random_leaf();
                  draw_point(x1,y1);
                  if(count > 690 && count <= 700)
                  {     int x2 = random_in_range(x+170, x+230);
                        int y2 = random_in_range(y+110, y+150);
                        int color = random_in_range(1,3);
                        if (color == 1)
                        {     set_pen_color(color::red);
                              draw_point(x2,y2); }
                        if (color == 2)
                        {     set_pen_color(color::orange);
                              draw_point(x2,y2); }
                        if (color == 3)
                        {     set_pen_color(color::yellow);
                              draw_point(x2,y2); } }

                  count = count + 1; } }
```

```
}

void tree(const int x, const int y)
{     int tr = random_in_range(1,2);

      if (tr == 1)
      {     set_pen_color(color::brown);
            fill_rectangle(x-20,y+100,10,70);
            int count = 1;
            set_pen_width(5);
            while(count <= 500)
            {     int x1 = random_in_range(x-45, x+5);
                  int y1 = random_in_range(y+30, y+120);
                  random_leaf();
                  draw_point(x1,y1);
                  count = count + 1; } }

      if (tr == 2)
      {     set_pen_color(color::brown);
            fill_rectangle(x+300,y+100,10,80);
            int count = 1;
            set_pen_width(5);
            while(count <= 700)
            {     int x1 = random_in_range(x+270,x+330);
                  int y1 = random_in_range(y,y+110);
                  random_leaf();
                  draw_point(x1,y1);
                  count = count + 1; } }
}

void main()
{     make_window(600,600);
      houses(120,80);
      bushes(120,80);
      tree(120,80);
      }
```



6. Make it look nice.

```
#include "library.h"

void building_color()
{     int red = random_in_range(20, 102);
      int green = random_in_range(0, 50);
      int blue = random_in_range(20, 70);
      double r = red / 255.0;
      double g = green / 255.0;
      double b = blue / 255.0;
      set_pen_color(r, g, b);
}

void random_leaf()
{     int red= random_in_range(0,50);
      int green= random_in_range(50,255);
      int blue= random_in_range(20,102);
      double r= red/255.0;
      double g= green/255.0;
      double b= blue/255.0;
      set_pen_color(r,g,b);}

void houses(const int x, const int y)
{     int house = random_in_range(1,2);

      if (house == 1)
      {     set_pen_color(color::black);
            fill_rectangle(x-1,y-1,202,152);
            building_color();
            fill_rectangle(x,y,200,150);
            building_color();
            fill_rectangle(x+10,y+20,50,35);
            fill_rectangle(x+75,y+20,50,35);
            fill_rectangle(x+140,y+20,50,35);
            fill_rectangle(x+10,y+90,50,35);
            fill_rectangle(x+140,y+90,50,35);
            set_pen_color(color::brown);
            fill_rectangle(x+80,y+90,35,60);
            set_pen_width(1);
            move_to(x-30,y);
            set_heading_degrees(360);
            start_shape();
            turn_right_by_degrees(60);
            note_position();
            draw_distance(150);
            turn_right_by_degrees(60);
            note_position();
            draw_distance(150);
            turn_right_by_degrees(150);
            note_position();
```

```
        draw_distance(260);
        note_position();
        fill_shape(); }

if (house == 2)
{       set_pen_color(color::black);
        fill_rectangle(x-1,y-1,202,152);
        building_color();
        fill_rectangle(x,y,200,150);
        set_pen_color(color::mauve);
        fill_rectangle(x+10,y+20,50,35);
        fill_rectangle(x+75,y+20,50,35);
        fill_rectangle(x+140,y+20,50,35);
        fill_rectangle(x+10,y+90,50,35);
        fill_rectangle(x+140,y+90,50,35);
        set_pen_color(color::brown);
        fill_rectangle(x+80,y+90,35,60);
        move_to(x-30,y);
        set_heading_degrees(360);
        set_pen_width(1);
        start_shape();
        turn_right_by_degrees(60);
        note_position();
        draw_distance(150);
        turn_right_by_degrees(60);
        note_position();
        draw_distance(150);
        turn_right_by_degrees(150);
        note_position();
        draw_distance(260);
        fill_shape();

        set_pen_color(color::black);
        fill_rectangle(x+201,y+70,75,81);
        building_color();
        fill_rectangle(x+201,y+71,74,79);
        set_pen_color(color::brown);

        move_to(x+201,y+50);
        start_shape();
        turn_right_by_degrees(90);
        note_position();
        draw_distance(20);
        turn_right_by_degrees(115);
        note_position();
        draw_distance(100);
        turn_right_by_degrees(155);
        note_position();
        draw_distance(91);
        turn_right_by_degrees(90);
        note_position();
        draw_distance(20);
```

```
            fill_shape();

            set_pen_color(color::mauve);
            fill_rectangle(x+210,y+90,55,60); }
}

void bushes(const int x, const int y)
{     int bush = random_in_range(1,2);

      if(bush == 1)
      {     int count = 1;
                  set_pen_width(5);
                  while(count <= 500)
                  {     int x1 = random_in_range(x+170, x+230);
                        int y1 = random_in_range(y+110, y+150);
                        random_leaf();
                        draw_point(x1,y1);
                        if(count > 690 && count <= 700)
                        {     int x2 = random_in_range(x+170, x+230);
                              int y2 = random_in_range(y+110, y+150);
                              int color = random_in_range(1,3);
                              if (color == 1)
                              {     set_pen_color(color::red);
                                    draw_point(x2,y2); }
                              if (color == 2)
                              {     set_pen_color(color::orange);
                                    draw_point(x2,y2); }
                              if (color == 3)
                              {     set_pen_color(color::yellow);
                                    draw_point(x2,y2); } }

                        count = count + 1; } }

      if(bush == 2)
      {     int count = 1;
            set_pen_width(5);
            while(count <= 500)
            {     int x1 = random_in_range(x+170, x+230);
                  int y1 = random_in_range(y+110, y+150);
                  random_leaf();
                  draw_point(x1,y1);
                  if(count > 690 && count <= 700)
                  {     int x2 = random_in_range(x+170, x+230);
                        int y2 = random_in_range(y+110, y+150);
                        int color = random_in_range(1,3);
                        if (color == 1)
                        {     set_pen_color(color::red);
                              draw_point(x2,y2); }
                        if (color == 2)
                        {     set_pen_color(color::orange);
                              draw_point(x2,y2); }
                        if (color == 3)
```

```
                        {     set_pen_color(color::yellow);
                              draw_point(x2,y2); } }

                  count = count + 1; } }

}

void tree(const int x, const int y)
{     int tr = random_in_range(1,2);

      if (tr == 1)
      {     set_pen_color(color::brown);
            fill_rectangle(x-20,y+100,10,70);
            int count = 1;
            set_pen_width(5);
            while(count <= 500)
            {     int x1 = random_in_range(x-45, x+5);
                  int y1 = random_in_range(y+30, y+120);
                  random_leaf();
                  draw_point(x1,y1);
                  count = count + 1; } }

      if (tr == 2)
      {     set_pen_color(color::brown);
            fill_rectangle(x+300,y+100,10,80);
            int count = 1;
            set_pen_width(5);
            while(count <= 700)
            {     int x1 = random_in_range(x+270,x+330);
                  int y1 = random_in_range(y,y+110);
                  random_leaf();
                  draw_point(x1,y1);
                  count = count + 1; } }
}

void windows(int x1, int x2)
{     int height = random_in_range(20, 25);
      int width = random_in_range(10, 15);
      int x = random_in_range(x1, x2);
      int y = random_in_range(200, 300);
      building_color();
      fill_rectangle(x-5, y-5, width*15, height*21);

      double random_space = random_in_range(2,3);
      building_color();
      int counts = 0;
      while (counts <= 30)
      {     fill_rectangle(x, y+height*counts, width*5/2, height);
            fill_rectangle(x+width*3, y+height*counts, width*5/2, height);
            fill_rectangle(x+width*6, y+height*counts, width*5/2, height);
            fill_rectangle(x+width*9, y+height*counts, width*5/2, height);
            fill_rectangle(x+width*12, y+height*counts, width*5/2, height);
```

```
            counts = counts + random_space; }

      int random_count = random_in_range(1,2);
      int rand_count = random_in_range(2,6);
      if (random_count == 1)
    {  set_pen_color(color::red);
            fill_rectangle(x+width*3, y+height*3*rand_count, width*1/2, height);
            fill_rectangle(x+width*3+width*2, y+height*3*rand_count, width*1/2,
height); }
      if (random_count == 2)
      {     set_pen_width(14);
            set_pen_color(color::orange);
            draw_point(x+width, y+height*rand_count*3*3/4); }
}

void sun()
{     move_to(900, 100);
      set_pen_width(100);
      set_pen_color(1.0, .843, 0.0);
      draw_point(); }

void moon()
{     move_to(900, 100);
      set_pen_width(100);
      set_pen_color(.933, .9098, .666);
      draw_point();
      set_heading_degrees(90);
      move_distance(18);
      set_pen_width(76);}

void time_of_day()
{     int const time = random_in_range(0, 6);
      if(time == 0)
      {     set_pen_color(0.0, 0.0, 0.0);
            fill_rectangle(0, 0, 1300, 700);
            moon();
            set_pen_color(0.0, 0.0, 0.0);
            draw_point();}

      else if(time == 1)
      {     set_pen_color(.6, .8, 1.0);
            fill_rectangle(0, 0, 1300, 700);
            sun();}

      else if(time == 2)
      {     set_pen_color(.2, .6, 1.0);
            fill_rectangle(0, 0, 1300, 700);
            sun();}

      else if(time == 3)
      {     set_pen_color(0.0, .502, 1.0);
            fill_rectangle(0, 0, 1300, 700);
```

```
            sun();}

      else if(time == 4)
      {     set_pen_color(.2, .2, 1.0);
            fill_rectangle(0, 0, 1300, 700);
            moon();
            set_pen_color(.2, .2, 1.0);
            draw_point();}

      else if(time == 5)
      {     set_pen_color(0.0, 0.0, .4);
            fill_rectangle(0, 0, 1300, 700);
            moon();
            set_pen_color(0.0, 0.0, .4);
            draw_point();}

      else if(time == 6)
      {     set_pen_color(.098, .098, .4392);
            fill_rectangle(0, 0, 1300, 700);
            moon();
            set_pen_color(.098, .098, .4392);
            draw_point();}}

void road()
{     set_pen_color(color :: grey);
      fill_rectangle(0, 600, 1300, 700); }

void grass()
{     set_pen_color(color :: green);
      fill_rectangle(0, 650, 1300, 675); }

void house_all(const int y)
{     int x1 = random_in_range(70,90);
      houses(x1,y);
      bushes(x1,y);
      tree(x1,y);

      int x2 = random_in_range(480,500);
      houses(x2,y);
      bushes(x2,y);
      tree(x2,y);

      int x3 = random_in_range(890,910);
      houses(x3,y);
      bushes(x3,y);
      tree(x3,y); }

void car(int const y)
{     int x = random_in_range(0,700);

      fill_rectangle(x,y,20,-15);
      fill_rectangle(x+20,y,15,-10);
```

```
        move_to(x+5,y);
        set_pen_width(7);
        set_pen_color(color::black);
        draw_point();
        move_to(x+20,y);
        draw_point();
        set_pen_color(color::dark_grey);
        fill_rectangle(x+2,y-8,7,-5);
        fill_rectangle(x+11,y-8,7,-5);
        set_pen_color(color::yellow);
        fill_rectangle(x+30,y-4,4,4);}

void main()
{       make_window(1300,900);
        time_of_day();
        windows(15, 35);
        windows(260, 280);
        windows(505, 525);
        windows(750, 770);
        windows(995, 1015);
        road();
        grass();
        car(625);
        house_all(650);
}
```