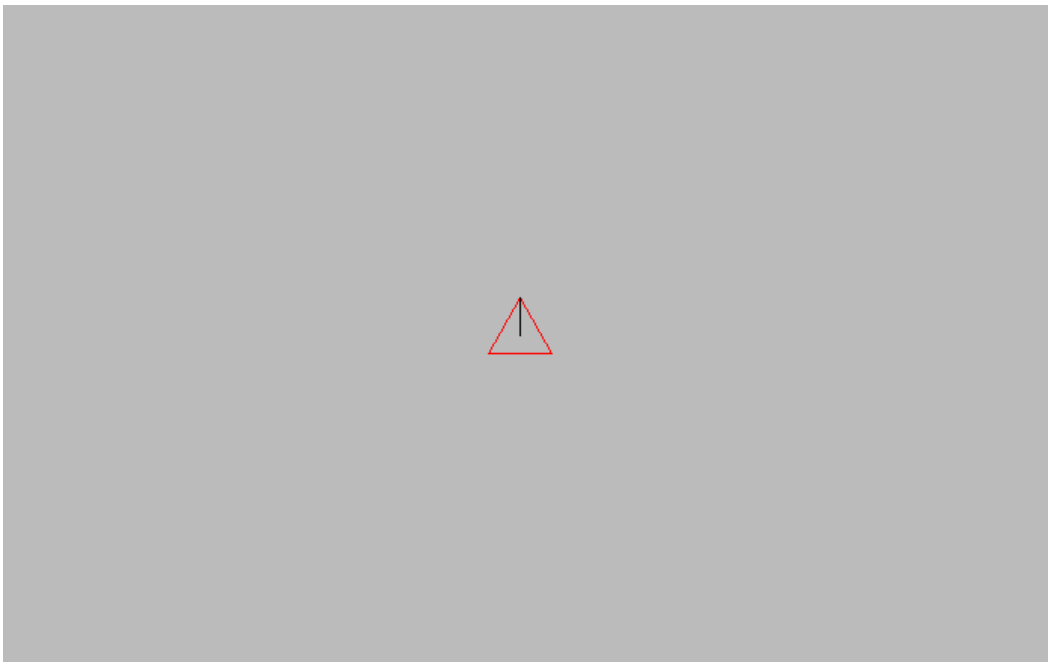
COMP500 / ENSE501: Week 12 – Exercise:

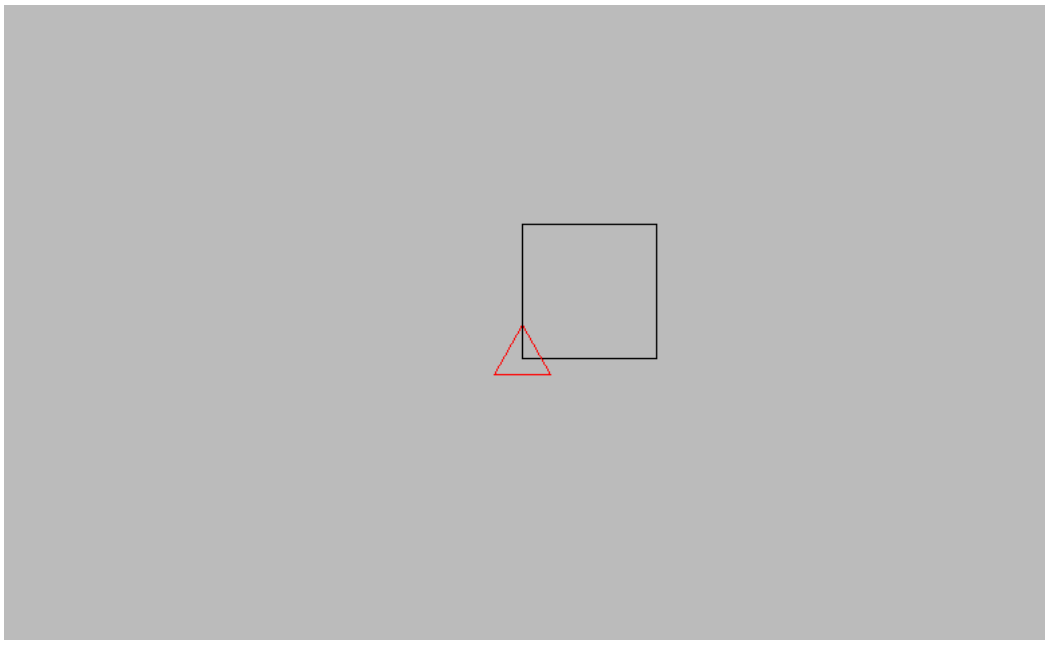
EXERCISE NAME: *Turtle Graphics*

Turtle graphics is a vector-based graphics drawing technique where a cursor (the "turtle") is controlled with simple commands such as *forward* and *turn*.

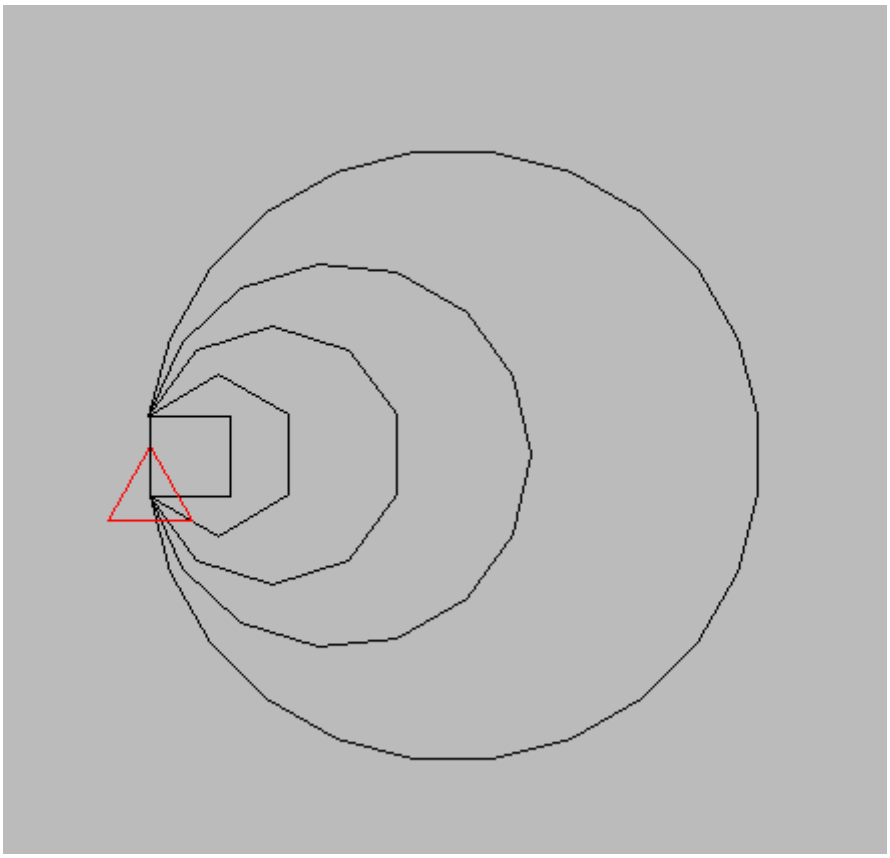
An example of a turtle graphics environment is as follows:



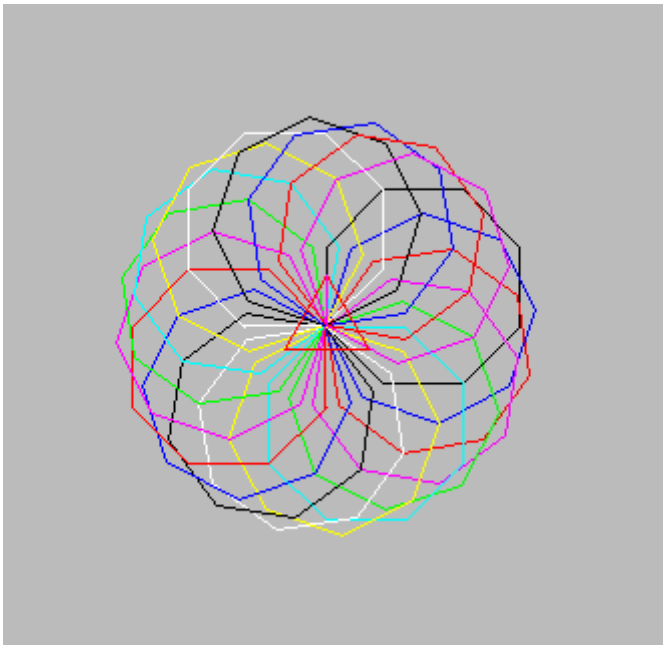
Simple shapes can be drawn using turtle graphics:



As well as shapes that are more complex:



And even visually interesting patterns:



The previous pattern was drawn with the following source code:

```
void draw_polygon(int sides)
{
    for (int k = 0; k < sides; ++k)
    {
        draw_side(360 / sides);
    }
}

int main(void)
{
    create_turtle_world();

    int repeats = 20;

    for (int n = 0; n < repeats; n++)
    {
        pen_colour(n % 8);
        draw_polygon(8)
        turn(360 / repeats);
    }

    return (p1world_shutdown());
}
```

Implement the following functions that can control the turtle:

- `void forward(float x);`
- `void turn(float degrees);`

And the following:

- `void pen_colour(enum Colour colour);`
- `void pen_up(void);`
- `void pen_down(void);`

Declare an enumeration for the following colour values:

```
enum Colour
{
    BLACK, BLUE, RED, MAGENTA, GREEN, CYAN, YELLOW, WHITE
};
```

Ensure your source code compiles and follows good programming standards. Ensure your program is well tested.