

# *Programação Reativa para Educação*

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`http://github.com/fsantanna-no/101`

# Programação Estruturada

- Entrada e Saída
- Atribuição
- Estruturas de Controle
  - Sequência
  - Condicional
  - Repetição
  - *Paralelismo (lógico)*

# Programação Estruturada

- Entrada e Saída
- Atribuição
- Estruturas de Controle
  - Sequência
  - Condicional
  - Repetição
  - *Paralelismo (lógico)*
- Abstrações
  - Código
  - Dados

```
par do
  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
```

```
par do
  var integer x1 = 25;
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  loop do
    var integer key = await KEY_PRESS;
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    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

code Pix (var integer x, y,
          var integer r, g, b,
          var integer key_left, key_right,
          key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end

```

```

par do
  var integer x1 = 25;
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  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
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  loop do
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code Pix (var integer x, y,
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  emit GRAPHICS_SET_RGB(r,g,b);
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    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end
end

```

```

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end

```

```

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  var integer x1 = 25;
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par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
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  await Pix(24,24,
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      x = x - 1;
    else/if <...> then
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  end
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```

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  await Pix(25,25,
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            KEY_UP,KEY_DOWN);
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  await Pix(24,24,
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      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

code Pix (var integer x, y,
          var integer r, g, b,
          var integer key_left, key_right,
          key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end
end

```

```

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end

```

```

par do
  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

code Pix (var integer x, y,
          var integer r, g, b,
          var integer key_left, key_right,
          key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end
end

```

```

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end

```

```

par do
  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

code Pix (var integer x, y,
          var integer r, g, b,
          var integer key_left, key_right,
          key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end
end

```

```

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end

```

```

par do
  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

code Pix (var integer x, y,
          var integer r, g, b,
          var integer key_left, key_right,
          key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end
end

```

```

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end

```

```

par do
  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

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          var integer r, g, b,
          var integer key_left, key_right,
          key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
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end

```

```

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  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
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    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

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          var integer r, g, b,
          var integer key_left, key_right,
          key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end
end

```

```

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  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end

```

```

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  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

code Pix (var integer x, y,
  var integer r, g, b,
  var integer key_left, key_right,
  key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end
end

```

```

par do
  await Pix(25,25,
    0xFF,0x00,0x00,
    KEY_LEFT,KEY_RIGHT,
    KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
    0x00,0xFF,0x00,
    KEY_a,KEY_d,
    KEY_w,KEY_s);
end

```



```

par do
  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

code Pix (var integer x, y,
          var integer r, g, b,
          var integer key_left, key_right,
          key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);

  with
    await Pix(24,24,
              0x00,0xFF,0x00,
              KEY_a,KEY_d,
              KEY_w,KEY_s);
end

```



```

par do
  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
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    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

code Pix (var integer x, y,
          var integer r, g, b,
          var integer key_left, key_right,
          key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
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      x = x - 1;
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      end
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    emit GRAPHICS_DRAW_PIXEL(x,y);
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end
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```

```

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end

```

```

par do
  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

code Pix (var integer x, y,
          var integer r, g, b,
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  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
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    var integer key = await KEY_PRESS;
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  end
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```

```

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end
end

```

```

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  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
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    var integer key = await KEY_PRESS;
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    if key == KEY_LEFT then
      x1 = x1 - 1;
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    end
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    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

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          var integer r, g, b,
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          key_up, key_down)
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  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end
end

```

```

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end

```

```

par do
  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

code Pix (var integer x, y,
          var integer r, g, b,
          var integer key_left, key_right,
          key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end
end

```

```

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end

```

```

par do
  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

code Pix (var integer x, y,
          var integer r, g, b,
          var integer key_left, key_right,
          key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end
end

```

```

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end

```

```

par do
  var integer x1 = 25;
  var integer y1 = 25;
  emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
  emit GRAPHICS_DRAW_PIXEL(x1,y1);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
    if key == KEY_LEFT then
      x1 = x1 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0xFF,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x1,y1);
  end
with
  var integer x2 = 24;
  var integer y2 = 24;
  emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
  emit GRAPHICS_DRAW_PIXEL(x2,y2);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
    if key == KEY_a then
      x2 = x2 - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(0x00,0xFF,0x00);
    emit GRAPHICS_DRAW_PIXEL(x2,y2);
  end
end
end

```

```

code Pix (var integer x, y,
          var integer r, g, b,
          var integer key_left, key_right,
          key_up, key_down)
  -> FOREVER
do
  emit GRAPHICS_SET_RGB(r,g,b);
  emit GRAPHICS_DRAW_PIXEL(x,y);
  loop do
    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(x,y);
    if key == key_left then
      x = x - 1;
    else/if <...> then
      <...>
    end
    emit GRAPHICS_SET_RGB(r,g,b);
    emit GRAPHICS_DRAW_PIXEL(x,y);
  end
end
end

```

```

par do
  await Pix(25,25,
            0xFF,0x00,0x00,
            KEY_LEFT,KEY_RIGHT,
            KEY_UP,KEY_DOWN);
with
  await Pix(24,24,
            0x00,0xFF,0x00,
            KEY_a,KEY_d,
            KEY_w,KEY_s);
end

```

```
data Posicao with
    var integer x;
    var integer y;
end

data Cor with
    var integer r;
    var integer g;
    var integer b;
end

data Controle with
    var integer left;
    var integer right;
    var integer up;
    var integer down;
end

code/await Pix (var Posicao posicao,
                var Cor cor,
                var Controle controle)
                -> FOREVER

do
    <...>
end

par do
    await Pix(Posicao(25,25),
              Cor(0xFF,0x00,0x00),
              Controle(KEY_LEFT,<...>));
with
    await Pix(Posicao(24,24),
              Cor(0x00,0xFF,0x00),
              Controle(KEY_a,<...>));
end
```

```
data Posicao with
    var integer x;
    var integer y;
end

data Cor with
    var integer r;
    var integer g;
    var integer b;
end

data Controle with
    var integer left;
    var integer right;
    var integer up;
    var integer down;
end

code/await Pix (var Posicao posicao,
                var Cor cor,
                var Controle controle)
                -> FOREVER

do
    <...>
end

par do
    await Pix(Posicao(25,25),
              Cor(0xFF,0x00,0x00),
              Controle(KEY_LEFT,<...>));
with
    await Pix(Posicao(24,24),
              Cor(0x00,0xFF,0x00),
              Controle(KEY_a,<...>));
end
```



```
data Posicao with
    var integer x;
    var integer y;
end
```

```
data Cor with
    var integer r;
    var integer g;
    var integer b;
end
```

```
data Controle with
    var integer left;
    var integer right;
    var integer up;
    var integer down;
end
```

```
code/await Pix (var Posicao posicao,
                 var Cor cor,
                 var Controle controle)
    -> FOREVER

do
    <...>
end

par do
    await Pix(Posicao(25,25),
              Cor(0xFF,0x00,0x00),
              Controle(KEY_LEFT,<...>));
with
    await Pix(Posicao(24,24),
              Cor(0x00,0xFF,0x00),
              Controle(KEY_a,<...>));
end
```

```
data Posicao with
    var integer x;
    var integer y;
end
```

```
data Cor with
    var integer r;
    var integer g;
    var integer b;
end
```

```
data Controle with
    var integer left;
    var integer right;
    var integer up;
    var integer down;
end
```

```
code/await Pix (var Posicao posicao,
                  var Cor cor,
                  var Controle controle)
    -> FOREVER
do
    <...>
end

par do
    await Pix(Posicao(25,25),
               Cor(0xFF,0x00,0x00),
               Controle(KEY_LEFT,<...>));
with
    await Pix(Posicao(24,24),
               Cor(0x00,0xFF,0x00),
               Controle(KEY_a,<...>));
end
```

```
data Posicao with
    var integer x;
    var integer y;
end
```

```
data Cor with
    var integer r;
    var integer g;
    var integer b;
end
```

```
data Controle with
    var integer left;
    var integer right;
    var integer up;
    var integer down;
end
```

```
code/await Pix (var Posicao posicao,
                  var Cor cor,
                  var Controle controle)
    -> FOREVER
```

```
do
    <...>
end
```

```
par do
    await Pix(Posicao(25,25),
              Cor(0xFF,0x00,0x00),
              Controle(KEY_LEFT,<...>));
```

```
with
    await Pix(Posicao(24,24),
              Cor(0x00,0xFF,0x00),
              Controle(KEY_a,<...>));
```

```
end
```

```
data Posicao with
    var integer x;
    var integer y;
end
```

```
data Cor with
    var integer r;
    var integer g;
    var integer b;
end
```

```
data Controle with
    var integer left;
    var integer right;
    var integer up;
    var integer down;
end
```

```
code/await Pix (var Posicao posicao,
                  var Cor cor,
                  var Controle controle)
    -> FOREVER
```

```
do
    <...>
end
```

```
par do
    await Pix(Posicao(25,25),
              Cor(0xFF,0x00,0x00),
              Controle(KEY_LEFT,<...>));
```

```
with
    await Pix(Posicao(24,24),
              Cor(0x00,0xFF,0x00),
              Controle(KEY_a,<...>));
```

```
end
```

```

data Posicao with
    var integer x;
    var integer y;
end

data Cor with
    var integer r;
    var integer g;
    var integer b;
end

data Controle with
    var integer left;
    var integer right;
    var integer up;
    var integer down;
end

```

```

code/await Pix (var Posicao posicao,
                 var Cor cor,
                 var Controle controle)
    -> FOREVER

do
    <...>
end

par do
    await Pix(Posicao(25,25),
              Cor(0xFF,0x00,0x00),
              Controle(KEY_LEFT,<...>));
with
    await Pix(Posicao(24,24),
              Cor(0x00,0xFF,0x00),
              Controle(KEY_a,<...>));
end

```

```

code/await Pix (var Posicao pos,
                var Cor cor,
                var Controle controle)
    -> FOREVER

do
    emit GRAPHICS_SET_RGB(cor.r, cor.g, cor.b);
    emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
    loop do
        var integer key = await KEY_PRESS;
        emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
        emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
        if key == controle.left then
            pos.x = pos.x - 1;
        else/if key == controle.right then
            pos.x = pos.x + 1;
        else/if key == controle.up then
            pos.y = pos.y - 1;
        else/if key == controle.down then
            pos.y = pos.y + 1;
        end
        emit GRAPHICS_SET_RGB(cor.r, cor.g, cor.b);
        emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
    end
end
end

```

```
data Posicao with
    var integer x;
    var integer y;
end
```

```
data Cor with
    var integer r;
    var integer g;
    var integer b;
end
```

```
data Controle with
    var integer left;
    var integer right;
    var integer up;
    var integer down;
end
```

```
code/await Pix (var Posicao posicao,
                var Cor cor,
                var Controle controle)
                -> FOREVER
```

```
do
    <...>
end
```

```
par do
    await Pix(Posicao(25,25),
              Cor(0xFF,0x00,0x00),
              Controle(KEY_LEFT,<...>));
```

```
with
    await Pix(Posicao(24,24),
              Cor(0x00,0xFF,0x00),
              Controle(KEY_a,<...>));
```

```
end
```

```
code/await Pix (var Posicao pos,
                var Cor cor,
                var Controle controle)
                -> FOREVER
```

```
do
```

```
    emit GRAPHICS_SET_RGB(cor.r, cor.g, cor.b);
    emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
```

```
    loop do
```

```
        var integer key = await KEY_PRESS;
        emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
        emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
        if key == controle.left then
```

```
            pos.x = pos.x - 1;
```

```
        else/if key == controle.right then
```

```
            pos.x = pos.x + 1;
```

```
        else/if key == controle.up then
```

```
            pos.y = pos.y - 1;
```

```
        else/if key == controle.down then
```

```
            pos.y = pos.y + 1;
```

```
        end
```

```
        emit GRAPHICS_SET_RGB(cor.r, cor.g, cor.b);
```

```
        emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
```

```
    end
```

```
end
```

```

data Posicao with
    var integer x;
    var integer y;
end

```

```

data Cor with
    var integer r;
    var integer g;
    var integer b;
end

```

```

data Controle with
    var integer left;
    var integer right;
    var integer up;
    var integer down;
end

```

```

code/await Pix (var Posicao posicao,
                var Cor cor,
                var Controle controle)
                -> FOREVER

```

```

do
    <...>
end

```

```

par do
    await Pix(Posicao(25,25),
              Cor(0xFF,0x00,0x00),
              Controle(KEY_LEFT,<...>));

```

```

with
    await Pix(Posicao(24,24),
              Cor(0x00,0xFF,0x00),
              Controle(KEY_a,<...>));

```

```

end

```

```

code/await Pix (var Posicao pos,
                var Cor cor,
                var Controle controle)
                -> FOREVER

```

```

do

```

```

    emit GRAPHICS_SET_RGB(cor.r, cor.g, cor.b);
    emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);

```

```

loop do

```

```

    var integer key = await KEY_PRESS;
    emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
    emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
    if key == controle.left then

```

```

        pos.x = pos.x - 1;

```

```

    else/if key == controle.right then

```

```

        pos.x = pos.x + 1;

```

```

    else/if key == controle.up then

```

```

        pos.y = pos.y - 1;

```

```

    else/if key == controle.down then

```

```

        pos.y = pos.y + 1;

```

```

    end

```

```

    emit GRAPHICS_SET_RGB(cor.r, cor.g, cor.b);

```

```

    emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);

```

```

end

```

```

end

```

```
data Posicao with
    var integer x;
    var integer y;
end
```

```
data Cor with
    var integer r;
    var integer g;
    var integer b;
end
```

```
data Controle with
    var integer left;
    var integer right;
    var integer up;
    var integer down;
end
```

```
code/await Pix (var Posicao posicao,
                var Cor cor,
                var Controle controle)
    -> FOREVER
```

```
do
    <...>
end
```

```
par do
    await Pix(Posicao(25,25),
              Cor(0xFF,0x00,0x00),
              Controle(KEY_LEFT,<...>));
```

```
with
    await Pix(Posicao(24,24),
              Cor(0x00,0xFF,0x00),
              Controle(KEY_a,<...>));
```

```
end
```

```
code/await Pix (var Posicao pos,
                var Cor cor,
                var Controle controle)
    -> FOREVER
```

```
do
```

```
    emit GRAPHICS_SET_RGB(cor.r, cor.g, cor.b);
    emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
```

```
    loop do
```

```
        var integer key = await KEY_PRESS;
        emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
        emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
        if key == controle.left then
```

```
            pos.x = pos.x - 1;
```

```
        else/if key == controle.right then
```

```
            pos.x = pos.x + 1;
```

```
        else/if key == controle.up then
```

```
            pos.y = pos.y - 1;
```

```
        else/if key == controle.down then
```

```
            pos.y = pos.y + 1;
```

```
        end
```

```
        emit GRAPHICS_SET_RGB(cor.r, cor.g, cor.b);
```

```
        emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
```

```
    end
```

```
end
```



```
data Posicao with
    var integer x;
    var integer y;
end
```

```
data Cor with
    var integer r;
    var integer g;
    var integer b;
end
```

```
data Controle with
    var integer left;
    var integer right;
    var integer up;
    var integer down;
end
```

```
code/await Pix (var Posicao posicao,
                var Cor cor,
                var Controle controle)
    -> FOREVER
```

```
do
    <...>
end
```

```
par do
    await Pix(Posicao(25,25),
              Cor(0xFF,0x00,0x00),
              Controle(KEY_LEFT,<...>));
```

```
with
    await Pix(Posicao(24,24),
              Cor(0x00,0xFF,0x00),
              Controle(KEY_a,<...>));
```

```
end
```

```
code/await Pix (var Posicao pos,
                var Cor cor,
                var Controle controle)
    -> FOREVER
```

```
do
```

```
    emit GRAPHICS_SET_RGB(cor.r, cor.g, cor.b);
    emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
```

```
    loop do
```

```
        var integer key = await KEY_PRESS;
        emit GRAPHICS_SET_RGB(0x00,0x00,0x00);
        emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
        if key == controle.left then
```

```
            pos.x = pos.x - 1;
```

```
        else/if key == controle.right then
```

```
            pos.x = pos.x + 1;
```

```
        else/if key == controle.up then
```

```
            pos.y = pos.y - 1;
```

```
        else/if key == controle.down then
```

```
            pos.y = pos.y + 1;
```

```
        end
```

```
        emit GRAPHICS_SET_RGB(cor.r, cor.g, cor.b);
```

```
        emit GRAPHICS_DRAW_PIXEL(pos.x, pos.y);
```

```
    end
```

```
end
```

# Trabalho 2

- Baseado no Trabalho 1
  - Aplicar sugestões do professor
  - Adotar abstrações de código e dados

# Trabalho 2

- Avaliações individualizadas
- Dificulta cola
- Sugestões tiram o aluno da zona de conforto