VGA Applications

1.   VGA with Switch

2.   VGA animated Object

3.   VGA adjust Speed
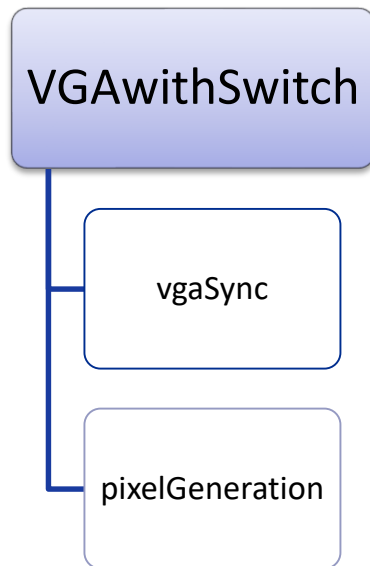
1. VGA with Switch
Design Description

- It is an example of a VGA application.

- It generates a square in the middle of the screen. The color of this square can be changed via switches.

1. VGA with Switch
## Hierarchy of VGAwithSwitch

VGAwithSwitch

Top module of the design and it only contains instantiation of the other modules. **You will use existing code for this module for first example but then you need to modify it.**

vgaSync

This module is synchronization circuit from the text book.

pixelGeneration

This module is for specifying pixels' colors. **You will use existing code for this example but then you will modify it for the other applications.**
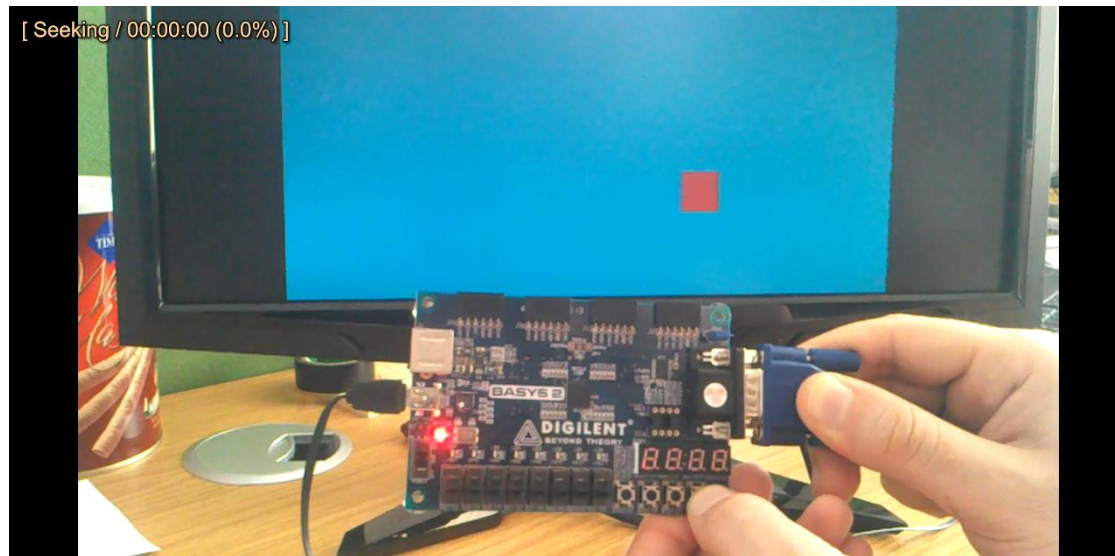
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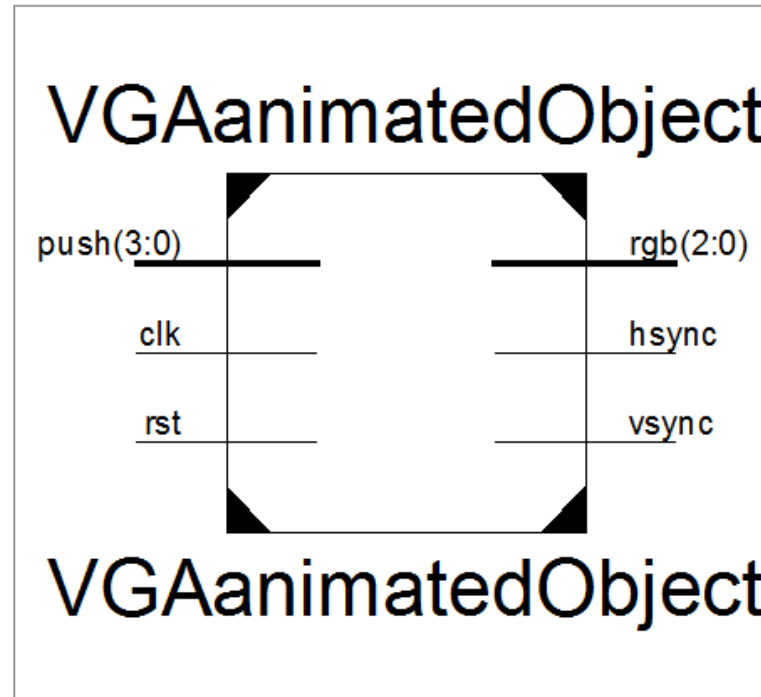ÜNIVERSITESI

1. VGA with Switch

Block Diagram
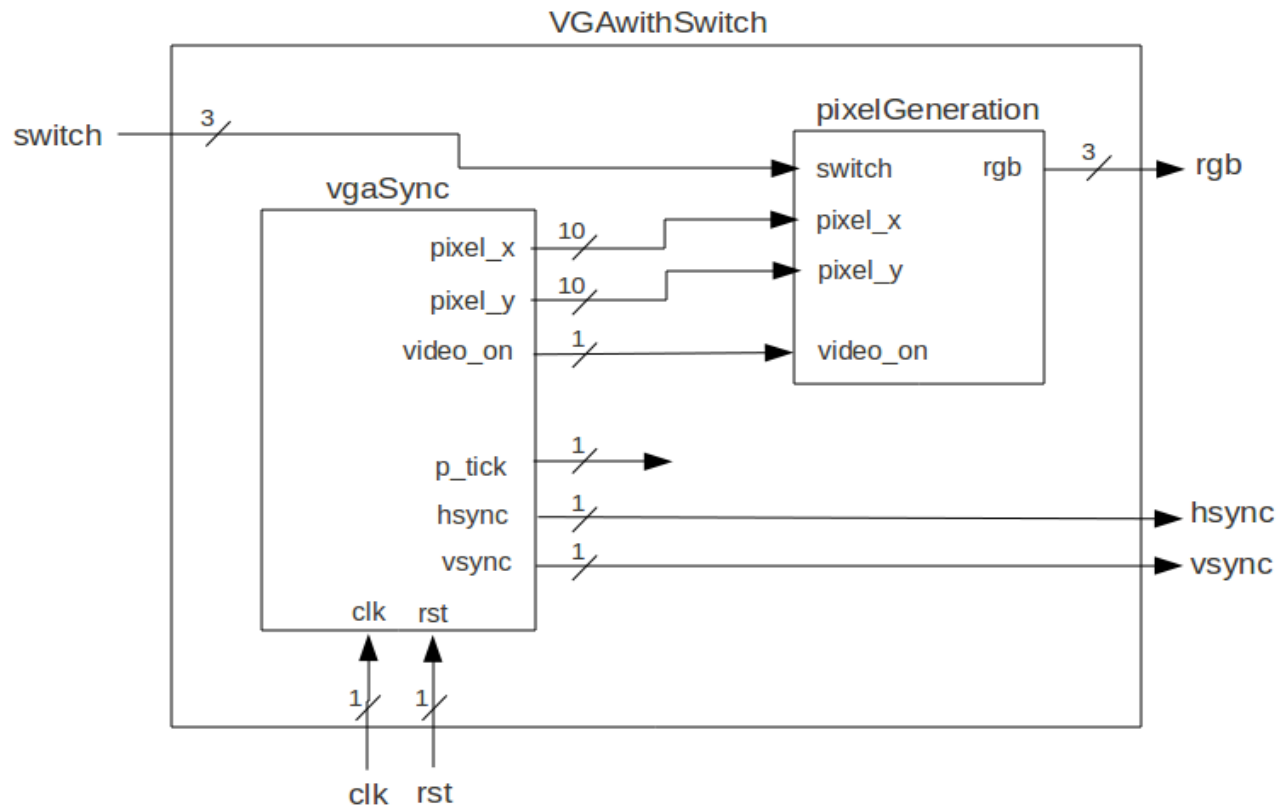
2. VGA animated Object
Design Description

- There is a square on the screen, and you should control it using 4 push buttons. There are 4 directions: up, down, left, and right.
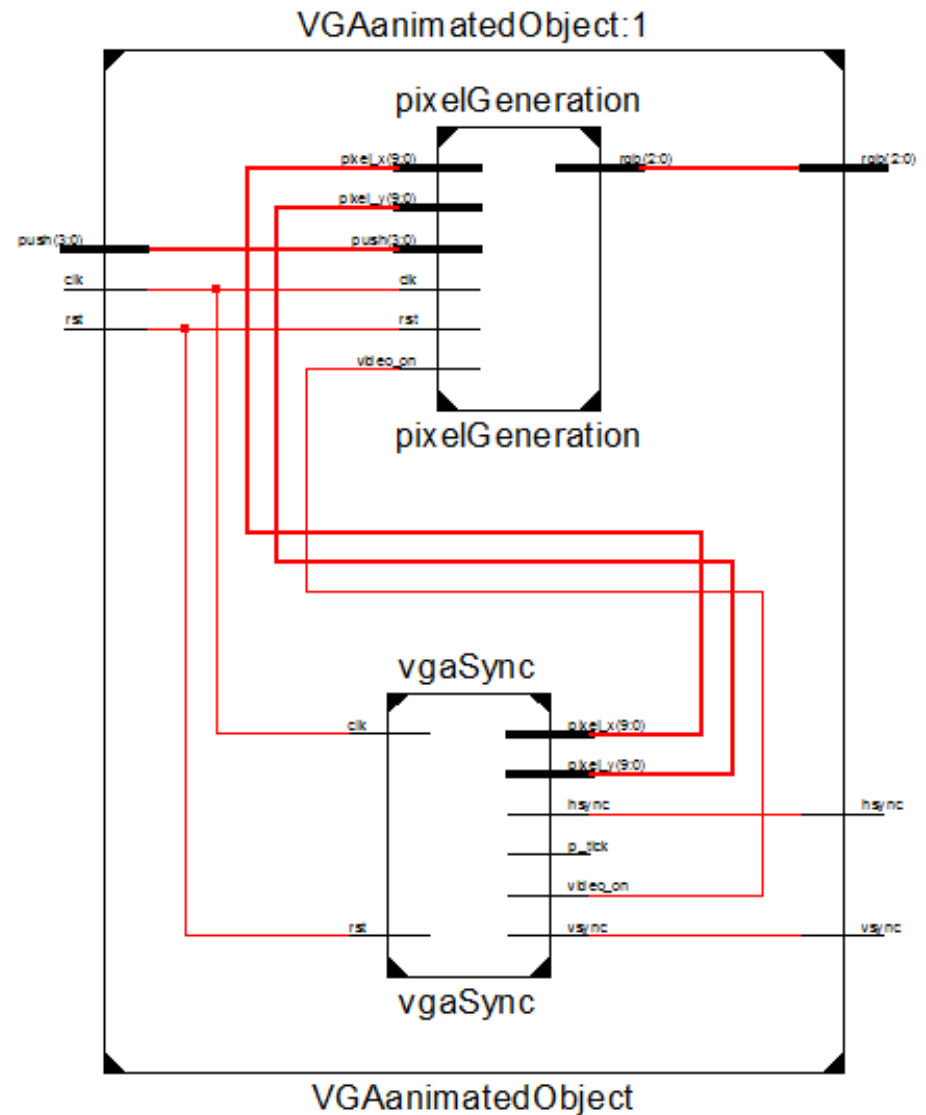
2. VGA animated Object

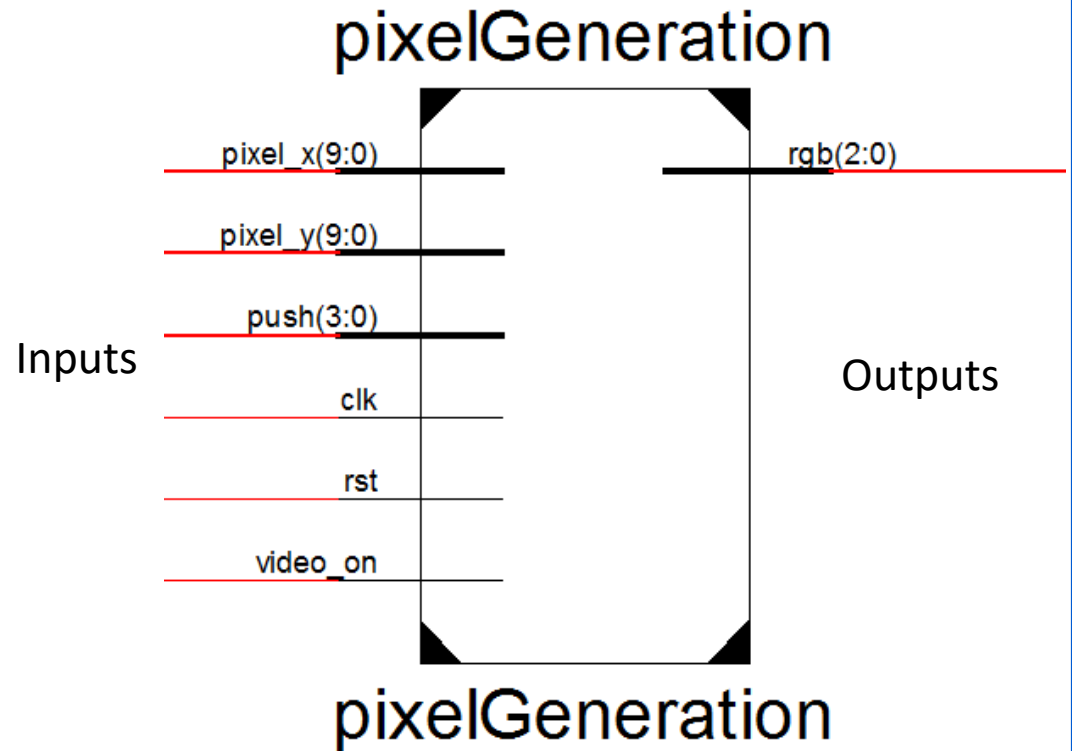### Inputs and outputs of top module for this application

2. VGA animated Object

- Inside of the top module there should be two modules (pixelGeneration and vgaSync) instantiated as in the figure.

2. VGA animated Object

- Inputs and outputs of the pixelGeneration. You should do major changes in this module to implement VGAanimatedObject application. You need to update square location, which will depend on the inputs coming from the buttons.
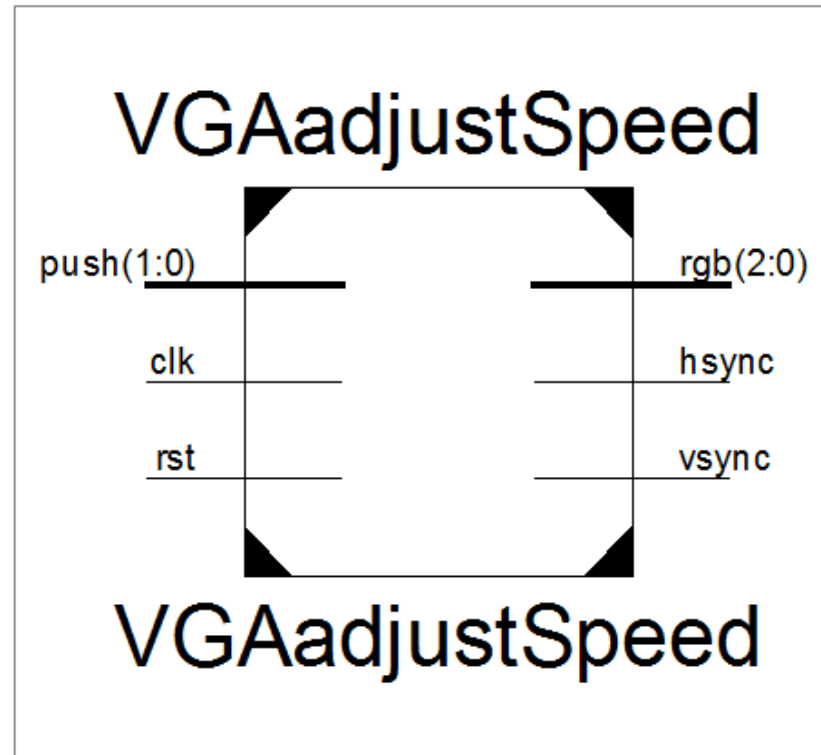

pixelGeneration

Inputs

pixel_x(9:0)

pixel_y(9:0)

push(3:0)

clk

rst

video_on

rgb(2:0)

Outputs

pixelGeneration

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3. VGA adjust Speed
Design Description

- This time square bounces on its own. We just adjust its speed using two push buttons. One of them increases the square speed and the other one decreases.
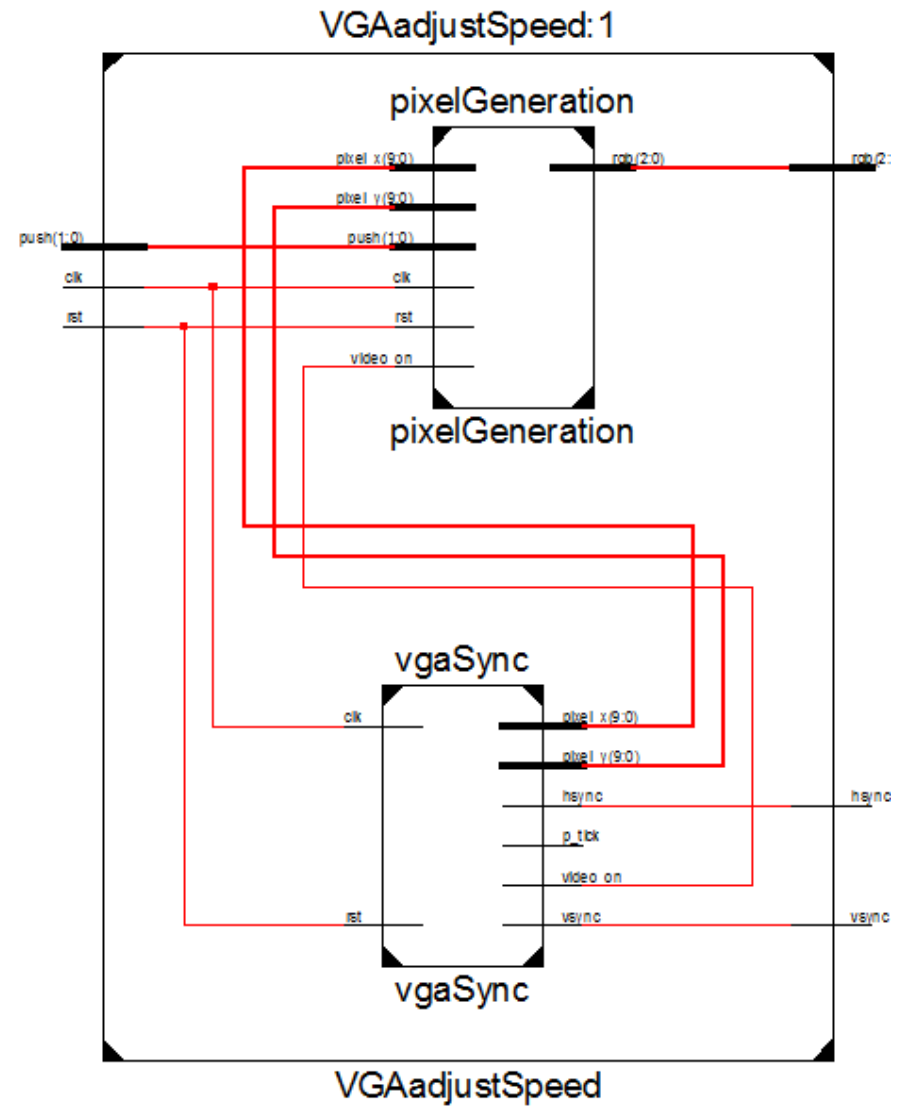
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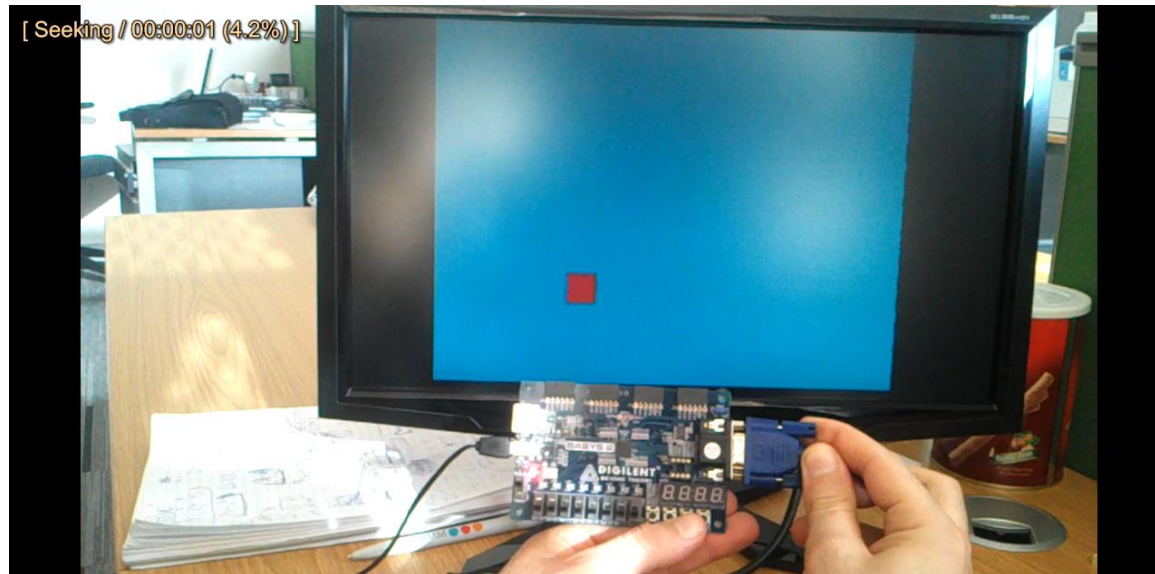
3. VGA adjust Speed

Inputs and outputs of top module for this application

3. VGA adjust Speed

- Similar to the previous applications, there are 2 submodules instantiated in the top module. You should instantiate them as in the figure.

3. VGA adjust Speed

- Inputs and outputs of pixelGeneration for this application.