# Fantastic Tetris

## Project Proposal

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# 1.Overview
## 1.1 Introduction

Our Project is based on an online game called 1010! with our implementation to realize it by using FPGA board and System Verilog. It is basically a puzzle game that player tries to fill the grid by the provided blocks. Once one row or column of grids. The picture of the game is shown in Figure.1.
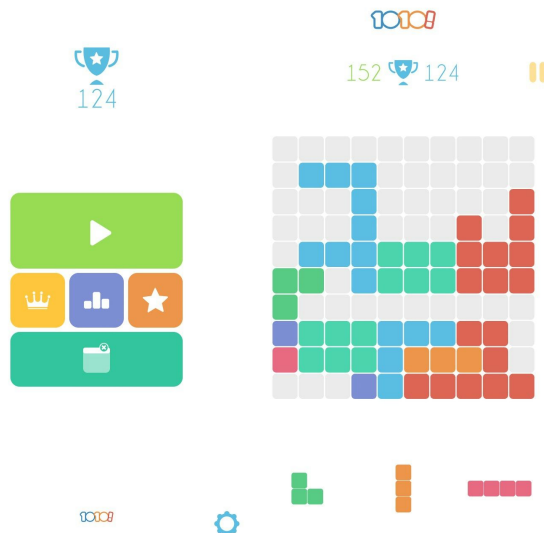


Figure.1

## 1.2 Mechanics

Player will be initially provided a 10*10 grid with three different shapes of blocks. Player must use these three blocks to fill the grids and the filled grid will not be able to fill more blocks before it is cleaned. Once one row or column of grids are fully filled, the whole row or column grids will be cleaned and is enable to fill new block. Before the player uses all of the three blocks, there will not be any new blocks provided. The game will provide three blocks in one time.

## 1.3 Goals and End

The goal of the game is to get higher score as much as possible. Once the left unused blocks can not be filled in to the grid the game is end.

## 1.4 Scoring

There are two ways to get score in the game: every time player fill new blocks in to the grids player can get scores based on the shape of blocks; every time one (or several) row(s) or column(s) of grids are filled, player can get scores based on the number of lines that are cleaned in one time.

## 1.5 Improvement

Set up a mechanism that allows player to withdraw a previous move to avoid negative effects of accidental move. This would help players achieve high scores.

## 2. Algorithms

## 2.1 Image

As a game, image is the most important thing since it is what the user will see. But because of our game is combined by only scoring displacement and blocks and grids. So for the basic game implementation there is no need for us to use image from other sources.

## 2.2 I/O

We will use the VGA screen as our Output and the input in the basic implementation will be a keyboard.

## 2.3 Controller

There are several conditions that controller need to detect and have response: switching the screen between start screen and game screen; refreshing the new blocks; refreshing the grids; determining if the blocks can be filled into the grid; scoring; determining if the game is end. If we can implement all of these functions then we achieved our basic goal.

## 3. Milestone

a) Set up all the hardware and software that need for the project. Complete the drivers of I/O (VGA screen and keyboard) and needed images.

b) Finish all the basic functions of the controller and test the basic module.

c) Integrate all the improvement to the module.