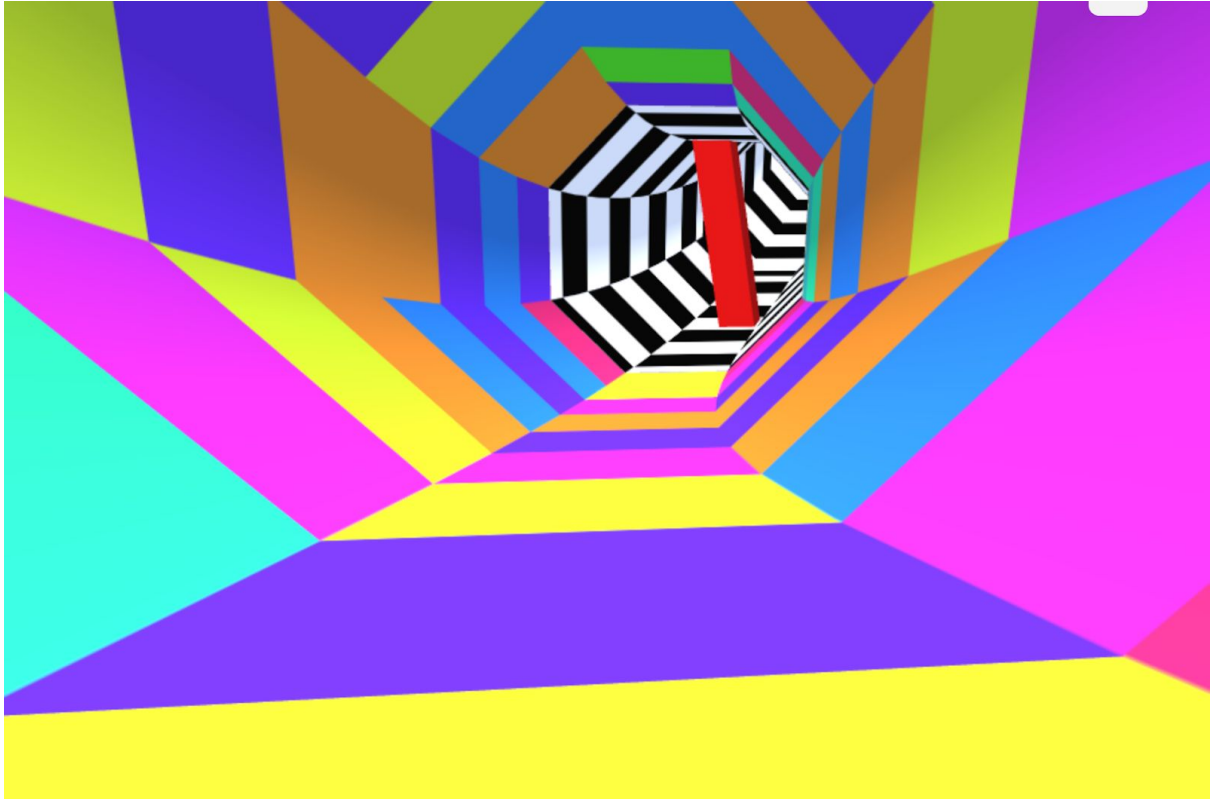


# Graphics

## Assignment 3

Deadline: 11:55 - 31st March 2018

### The Problem:



The goal of this assignment is to get yourselves familiarised with WebGL and basic shader concepts. This assignment will let you develop a tunnel runner with keyboard controllers. This will be an arcade game (inspired by [http://www.y8.com/games/Tunnel\\_Rush](http://www.y8.com/games/Tunnel_Rush)) where the player moves through a tunnel and avoids obstacles by switching lanes.

Score is given according to distance travelled. The player will level up when certain scores are attained and that will cause increasing the difficulty of the game by speeding it up. The primary objective is to score as much as possible.

In the following sections, the minimum requirements are mentioned. Use your imagination and enhance the game as per your liking. It is your game.

You should provide a single page quick start guide to those who want to play the game (aka TAs), describing the additional controls (basic controls should be as described below), and additional features.

Keep track of the scores and levels. They can be displayed on the screen too for bonus marks.

## The World:

The world is an octahedron shaped tunnel and the player runs on the bottom side. To dodge obstacles, the player can rotate the tunnel to change the bottom side or jump. The obstacles should initially be stationary and in later levels moving (like the game link).

## Objects and Physics:

You should incorporate the basic physics into the behaviour/ motion of the objects. The minimum set of factors you need to consider are:

1. An octahedral infinite tunnel.
2. Stationary obstacles and in later levels rotating/moving ones
3. Switching the bottom side. Doing so should change the gravity too. Gravity is always downwards. (see the game link)

## Shader Tasks:

**These tasks must be done using shaders and not javascript**

1. Make the world grayscale temporarily (using a button or timed)
2. Textured walls
3. Make the tiles flash periodically

## Controls:

The player is controlled by the arrow keys: A to go left, D to go right and SPACE to jump. Make sure multiple keys can be pressed at the same time (jump + a direction). Add any other controls to control the world as you would like.

## Submission:

You submissions should include your source code, a makefile and a compiled executable. You need to include a readme file that describes any additional information that is needed in compiling/executing you code. Do not use any non-standard libraries. In addition to these, include a file named help.txt or help.pdf (no word or other proprietary formats) in the submission that gives a one page description of the game and how to play it. Details of how to submit and any modification to the above submission details will be posted by the TAs towards the submission deadline. This assignment will take time to complete. Start early. All error scenarios must be gracefully handled (Games crashing during testing will be penalised).

- **Plagiarism in any form shall not be tolerated (MOSS will be used) and a straight F grade for the course will be given.**

- **Proper lighting must be present (maximum weightage will be given to how you incorporate various aspects of lighting and shading in your assignment)**
- **Use of external libraries must be verified by the TAs first.**

**Grading:**

You will be graded based on the correctness and efficiency (speed) of the implementation of the elements described above. Grading would take place in several stages.

Version 1.0: Tunnel with motion

Version 2.0: Obstacles both stationary and moving

Version 3.0: Shader tasks

Version 4.0: Use your imagination! :)