



# OpenGL Project

## HumanGL

42 staff [staff@42.fr](mailto:staff@42.fr)

*Summary: This project is an introduction to hierarchical modeling.*

*Version:*

# Contents

<b>I</b>	<b>Foreword</b>	<b>2</b>
<b>II</b>	<b>Introduction</b>	<b>4</b>
<b>III</b>	<b>Goals</b>	<b>5</b>
<b>IV</b>	<b>General instructions</b>	<b>6</b>
<b>V</b>	<b>Mandatory part</b>	<b>7</b>
<b>VI</b>	<b>Constraints</b>	<b>8</b>
<b>VII</b>	<b>Bonuses</b>	<b>9</b>
<b>VIII</b>	<b>Defense sessions</b>	<b>10</b>

# Chapter I

## Foreword

These are the lyrics of September by Earth, Wind and Fire :

Do you remember the 21st night of September?  
Love was changing the mind of pretenders  
While chasing the clouds away

Our hearts were ringing  
In the key that our souls were singing.  
As we danced in the night,  
Remember - how the stars stole the night away, yeah yeah yeah.

Hey hey hey,  
Ba de ya - say do you remember  
Ba de ya - dancing in September  
Ba de ya - never was a cloudy day

Ba duda, ba duda, ba duda, badu  
Ba duda, badu, ba duda, badu  
Ba duda, badu, ba duda

My thoughts are with you  
Holding hands with your heart to see you  
Only blue talk and love,  
Remember - how we knew love was here to stay

Now December found the love that we shared in September.  
Only blue talk and love,  
Remember - the true love we share today

Hey hey hey  
Ba de ya - say do you remember  
Ba de ya - dancing in September  
Ba de ya - never was a cloudy day....there was a  
Ba de ya - say do you remember  
Ba de ya - dancing in September

Ba de ya - golden dreams were shiny days

Now our bell was ringing, aha

Our souls were singing.

Do you remember every cloudy day - yau !

There was a

Ba de ya - say do you remember

Ba de ya - dancing in September

Ba de ya - never was a cloudy day....there was a

Ba de ya - say do you remember

Ba de ya - dancing in September

Ba de ya - golden dreams were shiny days

Ba de ya de ya de ya

Ba de ya de ya de ya

Ba de ya de ya de ya - De ya.... x2

This subject won't be easier if you are listening Disco, but that's freakin' cool.

And if you're feeling bad about some difficulties, just think about Travolta.

# Chapter II

## Introduction

Since OpenGL 3.0 the native matrices and their associated functions (`glRotate`, `glPushMatrix` and so on..) are deprecated.

In this project, you must implement your own matrix stack and matrix transformations in order to make a skeletal animation.

# Chapter III

## Goals

This project is an introduction to hierarchical modeling and matrix stack manipulation. You will learn to use matrices in order to link different parts of a model and make them move together in a logical way.

# Chapter IV

## General instructions

A Makefile or something similar is required. Only what contains your repository will be evaluated.

You can use the graphic library of your choice (SDL2, Glut, SFML..).

You need to use your own matrices and transformations with at least OpenGL 4.0.

You are free to use whatever language you want.

# Chapter V

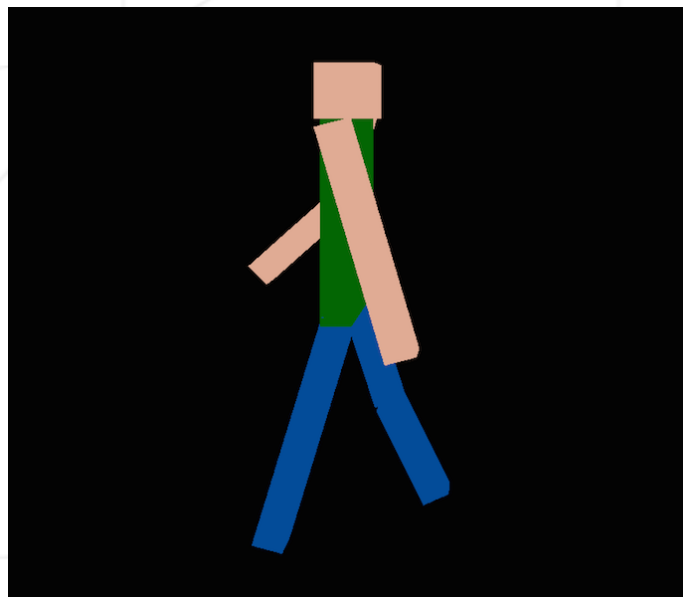
## Mandatory part

Body parts should be correctly articulated using your matrix stack. If the torso rotate, all the members must follow accordingly, therefore if the upper arm move only the forearm follows. When you modify the size of a member, related parts automatically reposition themselves.

Your model will have the following parts :

- a head
- a torso
- two arms with
  - upper arm
  - forearm
- two legs with
  - thigh
  - lower part

It should be able to walk, jump and stay put.





# Chapter VI

## Constraints

Each body part will be drawn by one and only one function call. This function will draw a 1x1x1 geometric shape at the origin of the current matrix. Otherwise you will not get all the points.



Upper and lower part of the same member are indeed two different parts.

# Chapter VII

## Bonuses

When your hierarchical model is completely working, it will be easy to add :

- More body parts.
- Other move patterns (Disco dance, Kung-fu fighting, ...).
- A kick-ass graphic interface where you can for example modify body part size, change their color, etc...

There will be some points dedicated to these bonuses and some more for your creativity.

# Chapter VIII

## Defense sessions

Be prepared to :

- Obviously run the program and show the different move patterns.
- Change member sizes. It must be easy to do, either in your code or at runtime.
- Show your drawing function, his calls and explain how it works.
- Explain your hierarchical model and the resulting matrix stack.