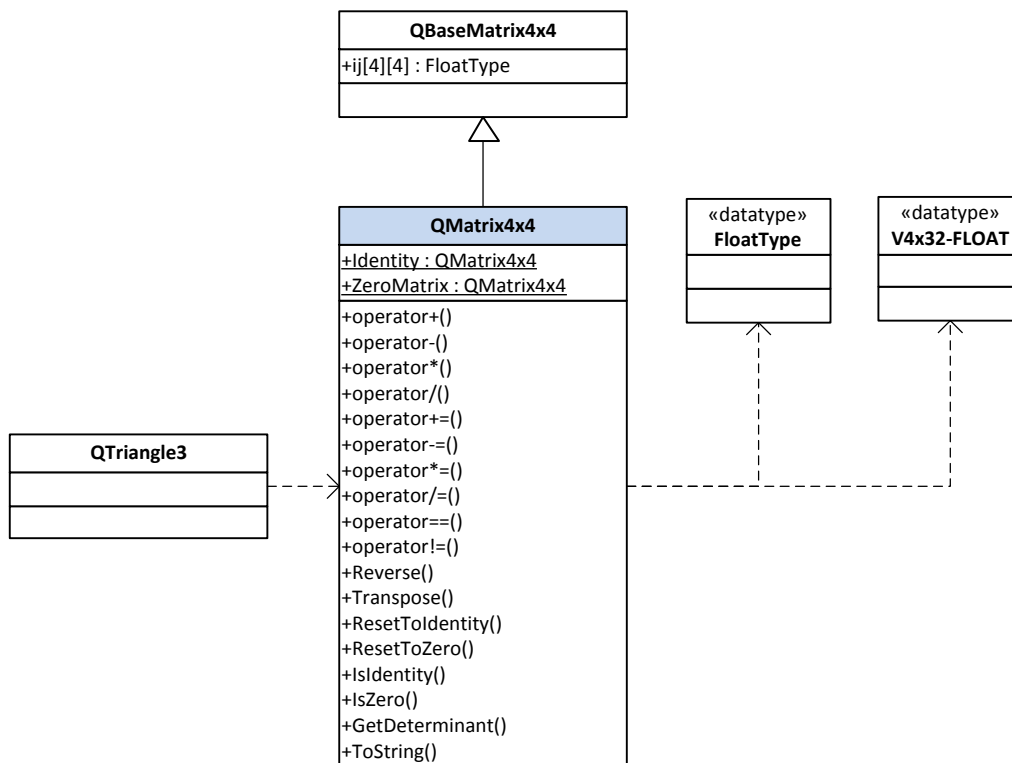


## Diagrams



## Knowledge Requirements

- Math
- See: Introduction to 3D Game Programming with DirectX 9.0, Part I.
- See: <Program Files Folder>\Microsoft DirectX SDK (June 2010)\Documentation\DirectX9\windows\_graphics.chm, from DirectX SDK. Search for D3DXMATRIX4 and D3DXMatrix in "Index" tab.
- See: [http://www.zator.com/Cpp/E4\\_9\\_18.htm](http://www.zator.com/Cpp/E4_9_18.htm) to refresh operators overloading knowledge.

## Functional Specifications

- Override default constructor. Sets attributes to zero.
- Override copy constructor.
- Implement constructor that receives a **QBaseMatrix4x4** type.
- Implement constructor that receives 3 **FloatTypes**, one for each Euler angle. The matrix must be initialized as if it was a rotation matrix, using inputs angles.
- Implement constructor that receives only 1 **FloatType**. Set all attributes to that value.
- Implement constructor that receives a 16-**FloatTypes** array. Remember that Quimera Engine uses a row x column convention.
- Implement constructor that receives a pointer-to-**FloatType**. The pointer should point to a dynamically allocated 16-**FloatTypes** array. Remember that Quimera Engine uses a row x column convention.
- Implement constructor that receives four **V4x32-FLOATs**. One per row.
- It is not necessary to override default destructor.
- It is not necessary to override assign operator.
- Operator\* must offer an overload that receives a **FloatType** (product by scalar).
- Operator\* must offer an overload that receives a **QBaseMatrix4x4**.

- Operator/ implements “division by scalar” only, there is no division operation between matrices.
- Operator/= implements “division by scalar” only, there is no division operation between matrices.
- A global operator\* must be implemented in order to let a FloatType be multiplied by a QMatrix4x4. It’s not the same QMatrix4x4 \* FloatType than FloatType \* QMatrix4x4.
- A global operator/ must be implemented in order to let a FloatType be multiplied by a QMatrix4x4. It’s not the same QMatrix4x4 / FloatType than FloatType / QMatrix4x4.
- ResetToZero sets all matrix’s elements to 0.
- ToString format: “M4x4( 11, 12, 13, 14 )( 21, 22, 23, 24 )( 31, 32, 33, 34 ) ( 41, 42, 43, 44 )”. Use STL string.

## Design / Technical Requirements

- Use member initialization lists.
- Remember using “explicit” when constructors receive only one parameter.
- No virtual methods.
- Use by-reference parameters always.
- Operator== and Operator!= must have Epsilon value into account.
- Use FloatType constants to store values like 0.
- All methods should be inline.
- No exceptions.
- No error codes.
- No profiling.
- Check for division by zero. Use asserts.
- Respect diagram names.

## Support People

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