OpenGL Stack Implementation

Push() and Pop()

- Push()
 - 1. Copy what's on top of the stack
 - 2. Push that copy on top of the stack



- Pop()
 - Pop whatever on top of the stack

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
      R()
      Cube()
   Pop()
Pop()
```

LoadIdentity()

```
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
      R()
      Cube()
   Pop()
Pop()
```

Top → Identity

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
      R()
                              Top →
                                             Identity
      Cube()
   Pop()
                                             Identity
Pop()
```

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
      R()
                              Top →
                                            Identity
                                                           *T
      Cube()
   Pop()
                                            Identity
Pop()
```

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
      R()
                              Top →
                                             Identity
                                                                 *R
      Cube()
   Pop()
                                             Identity
Pop()
```

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
                              Top →
                                            Identity
                                                                 *R
      R()
                                                                 *R
                                            Identity
                                                           *T
      Cube()
   Pop()
                                            Identity
Pop()
```

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
                              Top →
                                                                       *5
                                             Identity
                                                                 *R
      R()
                                            Identity
                                                                 *R
                                                            *T
     Cube()
   Pop()
                                            Identity
Pop()
```

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
                              Top →
                                             Identity
                                                                       *5
                                                                 *R
                                                                             *R
      R()
                                            Identity
                                                                 *R
                                                            *T
     Cube()
   Pop()
                                            Identity
Pop()
```

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
      R()
      Cube()
   Pop()
Pop()
```

What you need to remember when rendering



```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
      R()
                                                                 *R
                                            Identity
                             Top →
      Cube()
   Pop()
                                            Identity
Pop()
```

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
                              Top →
                                             Identity
                                                                  *R
      R()
                                             Identity
                                                                 *R
      Cube()
   Pop()
                                             Identity
Pop()
```

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
                              Top →
                                             Identity
                                                                       *R
                                                                 *R
     R()
                                            Identity
                                                                 *R
                                                            *T
     Cube()
   Pop()
                                            Identity
Pop()
```

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
                             Top →
                                            Identity
                                                                       *R
                                                                 *R
                                                                             Cube
      R()
                                            Identity
                                                           *T
                                                                 *R
     Cube()
   Pop()
                                            Identity
Pop()
```

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
      R()
                              Top →
                                             Identity
                                                                 *R
      Cube()
   Pop()
                                             Identity
Pop()
```

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
      R()
      Cube()
                             Top →
   Pop()
                                            Identity
Pop()
```

```
LoadIdentity()
Push()
   T()
   R()
   Push()
     S()
     R()
     Teapot()
   Pop()
   Push()
      R()
      Cube()
   Pop()
Pop()
```

```
Display()
{
    // row-col-major issue
    m = Lookat() * whatever your transform();
    glLoadMatrix( pointer to m)
}
```