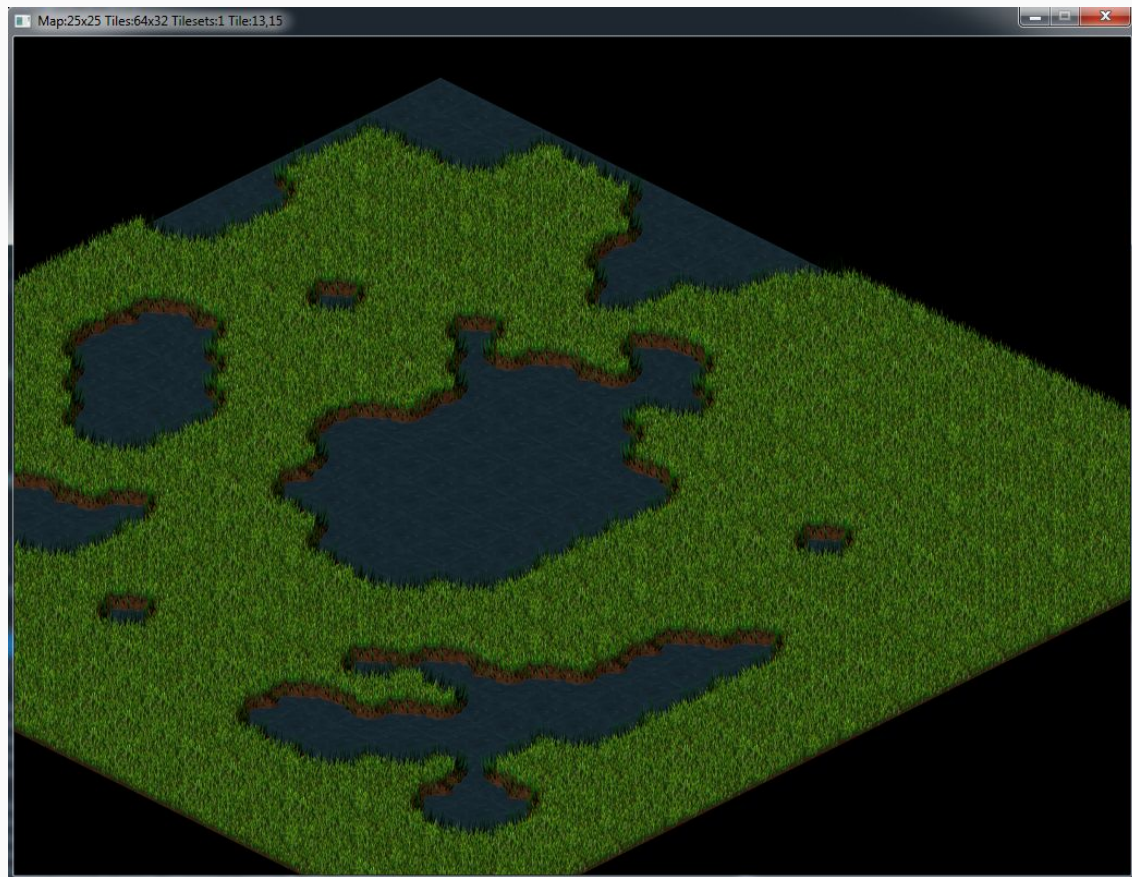


Game Development

Isometric Draw



Let's draw isometric maps



We will use the traditional 2:1 ratio

ISOMETRIC PART 1

GRID



- This is a 2:1 ratio: for every 2 horizontal pixels you should move vertically by one pixel
- Vertical lines are always straight



CARVING



- You can freely move iso objects without worrying about the perspective
- Lines can be replaced by transitions and bright corners



- Use cuboids to create basic shapes and carve the desired shape out of it
- Apply texture after the basic shape is solved

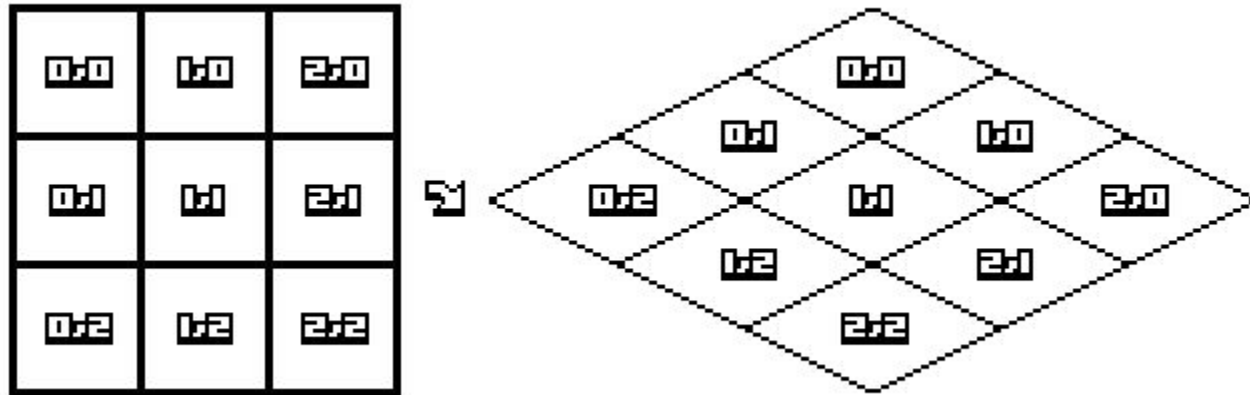
CONVERTING FROM FLAT



- Sometimes it's easier to draw something flat and then convert to iso
- This is a useful tool, but don't rely only on this

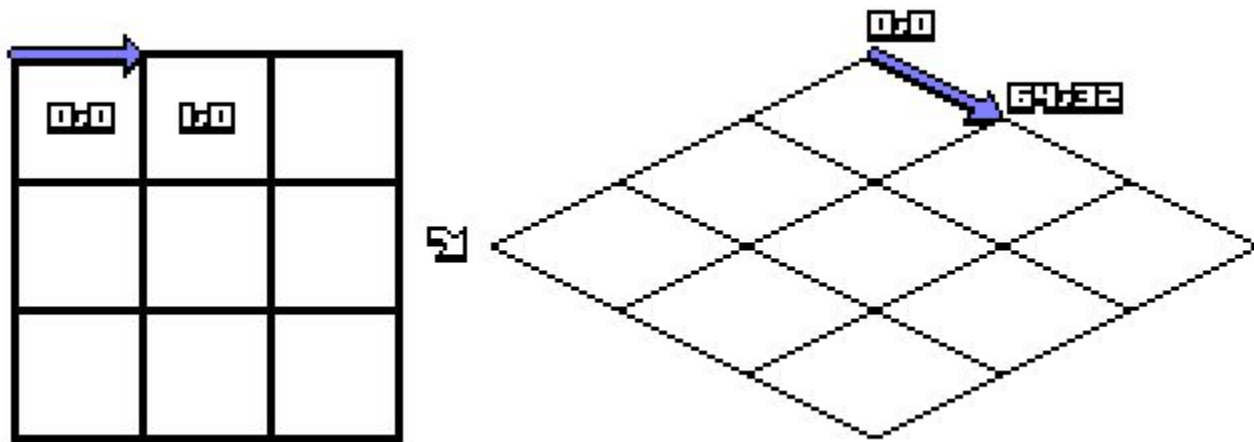
MORE STUFF+PATREON.COM/SAINT11

Isometric Projection (one of many)



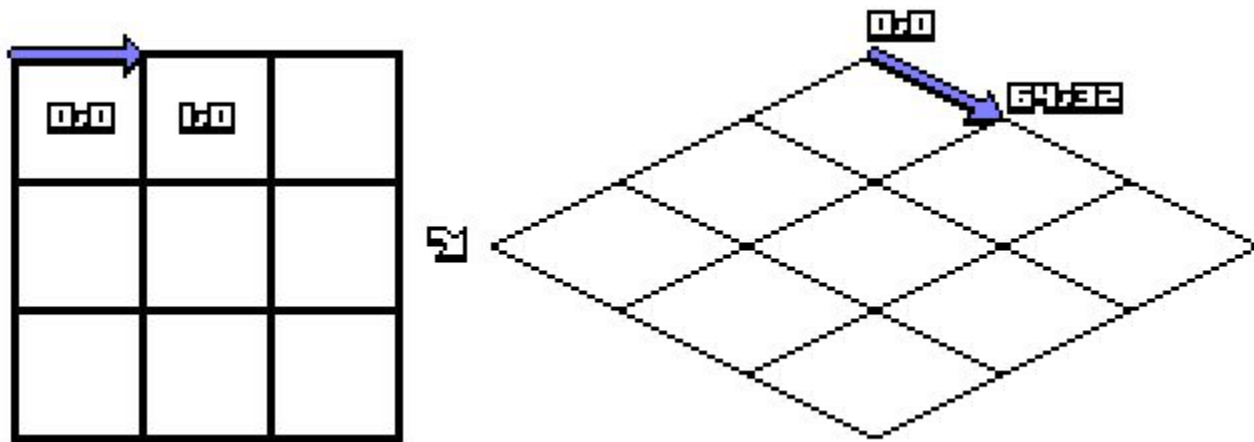
With pen & paper write down all screen coordinates (each projected tile is 128x64)

Map to World



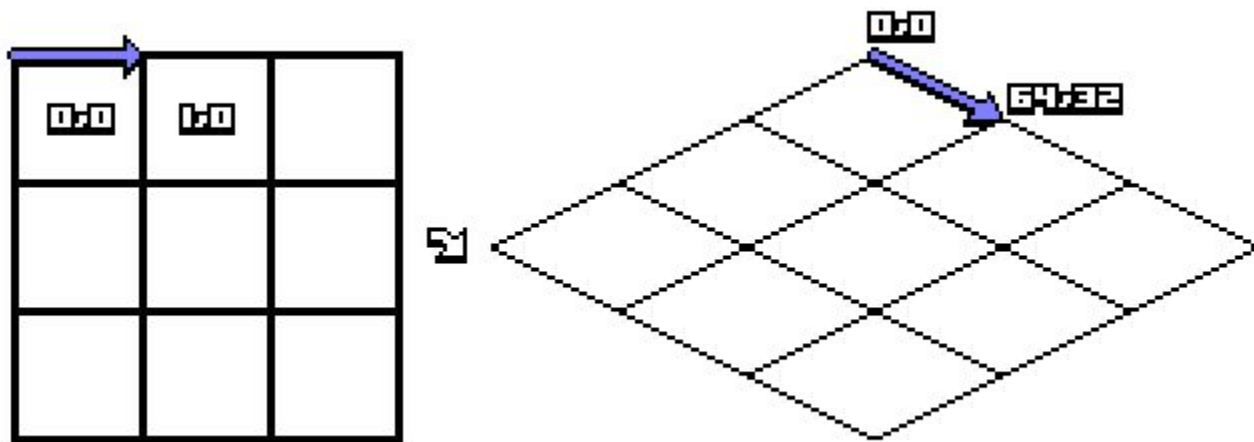
To go from `0,0` to `1,0` we increase **x** by 64 (**half tileset width**) and **y** by 32 (**half tileset height**)

Map to World



What happens if we want to go to 0,1 ? We decrease the **x** by half tile width and increase **y** by half tile height to get **(-64,32)**

Map to World



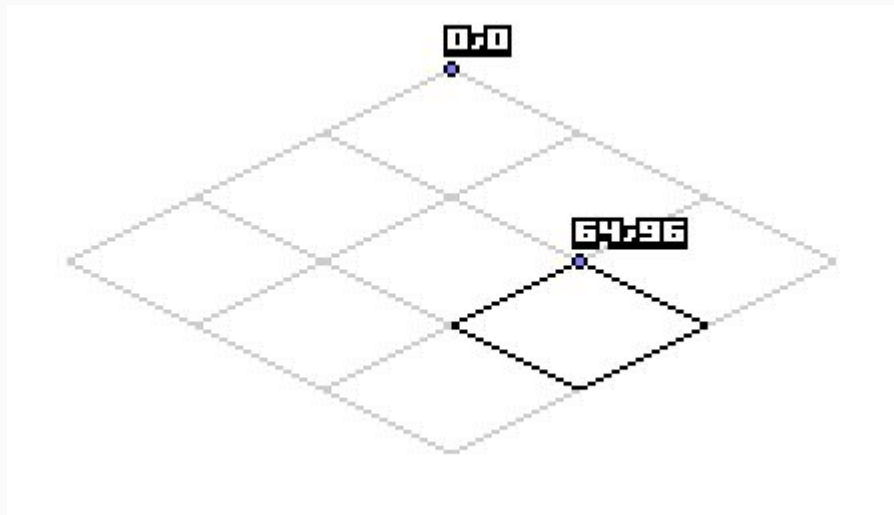
```
screen.x = map.x * HALF_TILE_WIDTH - map.y * HALF_TILE_WIDTH;
```

```
screen.y = map.x * HALF_TILE_HEIGHT + map.y * HALF_TILE_HEIGHT;
```

Map to World

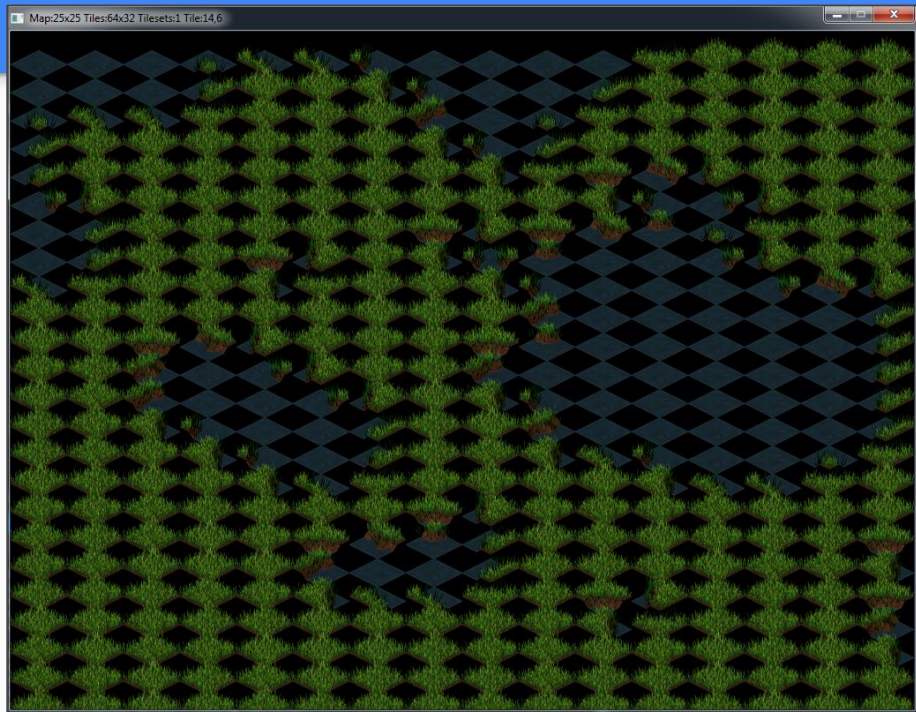
What would be the screen coordinates to tile 2,1 ?

Would be pixel **64,96** !



Map to World

- Orthogonal is:
 - $ret.x = x * data.tile_width;$
 - $ret.y = y * data.tile_height;$
- Isometric changes to:
 - $ret.x = (x - y) * (data.tile_width * 0.5f);$
 - $ret.y = (x + y) * (data.tile_height * 0.5f);$



TODO 1

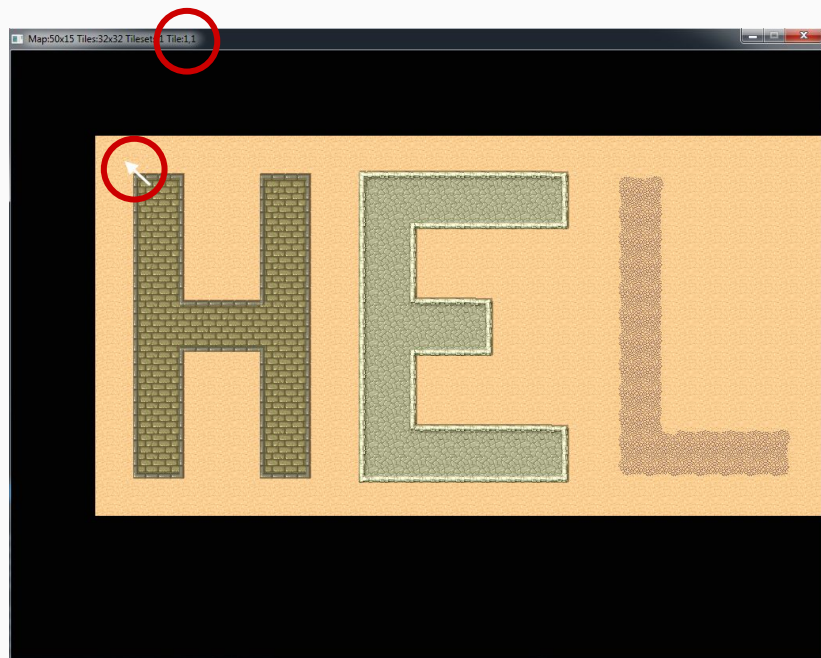
“Add isometric map to world coordinates”

- Add a case in *MapToWorld* function for isometric maps
- Try loading **iso.tmx**

TODO 2

“Add orthographic world to map coordinates”

- It is just the inverse math from MapToWorld
- Check that you receive something that makes sense



TODO 3

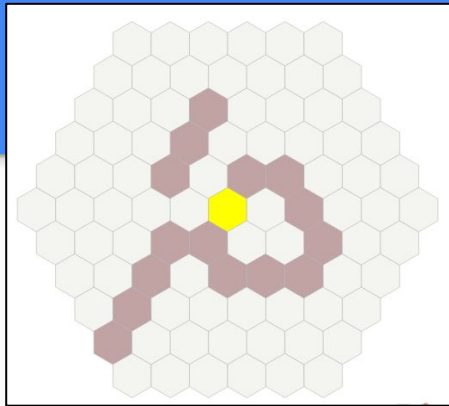
*“Add the case for isometric maps to
WorldToMap”*

- Again, you have to make some math!
- Check the result



Documentation

- If in doubt, read this article about [isometric math](#)
- If curious, check how to deal with [hexagonal maps](#)



ACHIEVEMENT UNLOCKED!
USED ALGEBRA AFTER GRADUATION