DigDrop

Assignment 3 – CSSE2002, Semester 2 2018.

Kenton Lam

Overview

Inspired by the underrated game *Minecraft,* which focused on mining and crafting, we are proud to present *DigDrop*, a game of both digging and dropping.

Features

- Expansive 81 tiles of visible terrain.
- Full three-dimensional movement, in four distinct directions.
- Four diverse block types to discover, with two only appearing deep underground.
- Cutting-edge NVIDIA® GeForce RTX™-inspired shading effects.
- Effective and intuitive user interface.
- Saves and loads game progress.

Usage

Upon loading the game, you will see a blank window similar to the one below. The controls are disabled as no map has been loaded yet.
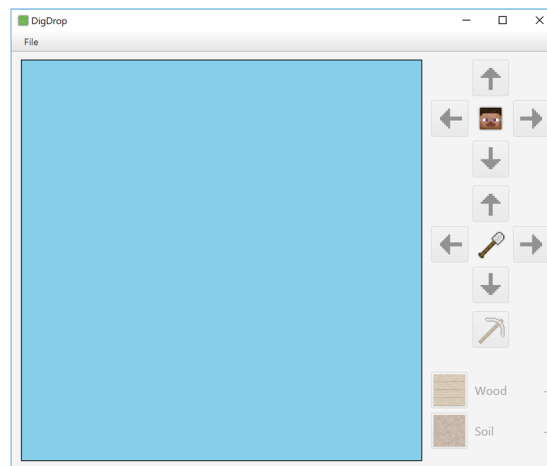
The File menu (top left) has options for opening and saving maps. Clicking "Open…" or "Save As…" will show a dialog so you can select a file path.

After opening a map, the display will be updated to show the top blocks of each tile, the builder's inventory, and you can also interact with the buttons. The builder's position is in the top right.
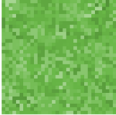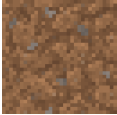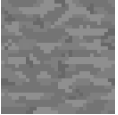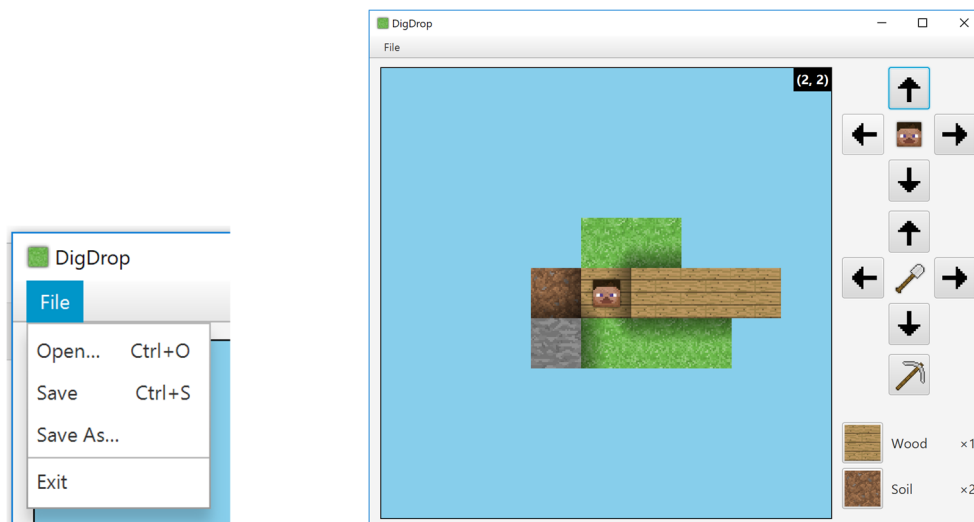
World Map

The builder is in the centre of the map, denoted by the head. An area of 9×9 tiles is displayed, centred on the builder. A blue background represents no tile in that position.

Block Types

These are the blocks you might encounter, along with how you can interact with each one.

	Grass	Soil	Wood	Stone	Bedrock
	A soft surface. Can't be picked up.	Coarse earth. Hard to push but can be dug.	Wooden planks. Can be easily moved.	Solid rock. Impossible to move in any way.	Dense stone deep in the ground. Immoveable.
Diggable	✓	✓	✓	✕	✕
Moveable	✕	✕	✓	✕	✕
Carryable	✕	✓	✓	✕	✕

Additionally, all blocks can be walked on. Bedrock only appears at the very bottom of tiles. It represents a tile with no blocks.

Only carryable blocks will be picked up after you dig them. Thus, wood and soil are the only blocks which can be in your inventory.

Graphics Options

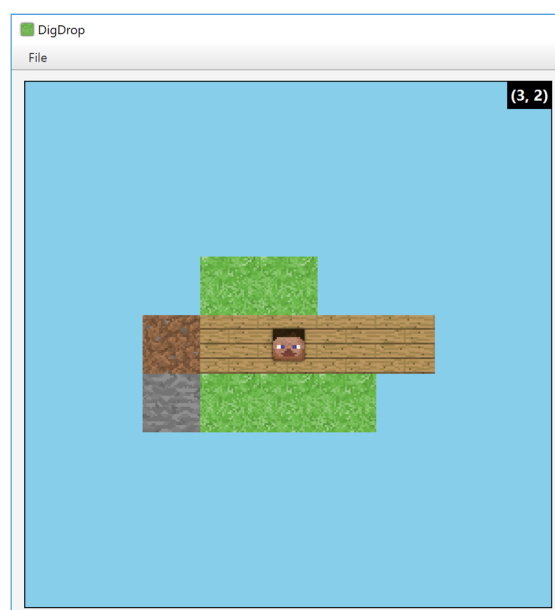You can press the following keys to enable/disable informational overlays on the map.

Z	Toggles displaying tile heights on each block.
X	Toggles displaying exits from each tile.
C	Toggles the NVIDIA® GeForce RTX™-inspired ambient occlusion engine.

Examples of views after toggling these options are shown below.
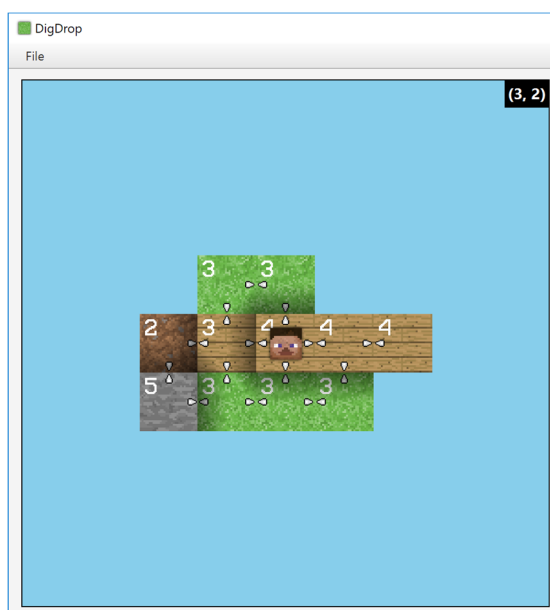
After enabling tile heights and exits.

RTX™-mode off.

Buttons

On the right of the window are buttons for doing useful things.

Buttons around the builder icon move the builder in the direction of the arrow. Disabled buttons indicate no exit in that direction.

Buttons around the shovel icon push the block the builder is standing on in the direction of the arrow. Disabled buttons indicate no exit in that direction.

The pickaxe button digs the block the builder is standing on.
If the dug block can be carried, it will be added to your inventory.

The wooden planks button places a wood block on the current tile.
The number to the right indicates how many wood blocks are in your inventory.

The dirt button places a soil block on the current tile.
The number to the right indicates how many soil blocks are in your inventory.

Alternatively, the keyboard can be used to control the builder.

|	
W A S D	Moves the builder north, west, south or east, respectively.
↑ ← ↓ →	Moves the current top block north, west, south or east, respectively.
Q	Digs on the current block.
1	Places a wood block.
2	Places a soil block.

Info / Error Messages

Informational and error messages are shown as needed. If an attempted action is invalid, an error message will be shown (example below). If the world map is saved or loaded successfully, a message will also be shown.

Error messages will be shown in the following cases:

- Moving to a tile which is too high or too low.
- Moving a block which cannot be moved.
- Moving a block to a tile which is not lower than the current tile.
- Digging a block which cannot be dug.
- Placing wood at height 8, or placing soil at or above height 3.
- Placing a block when you have none of that block.
- Errors while saving or loading.
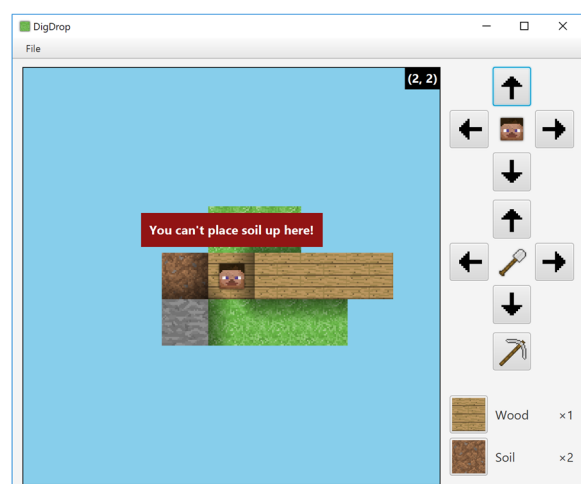
Annotated Screenshot
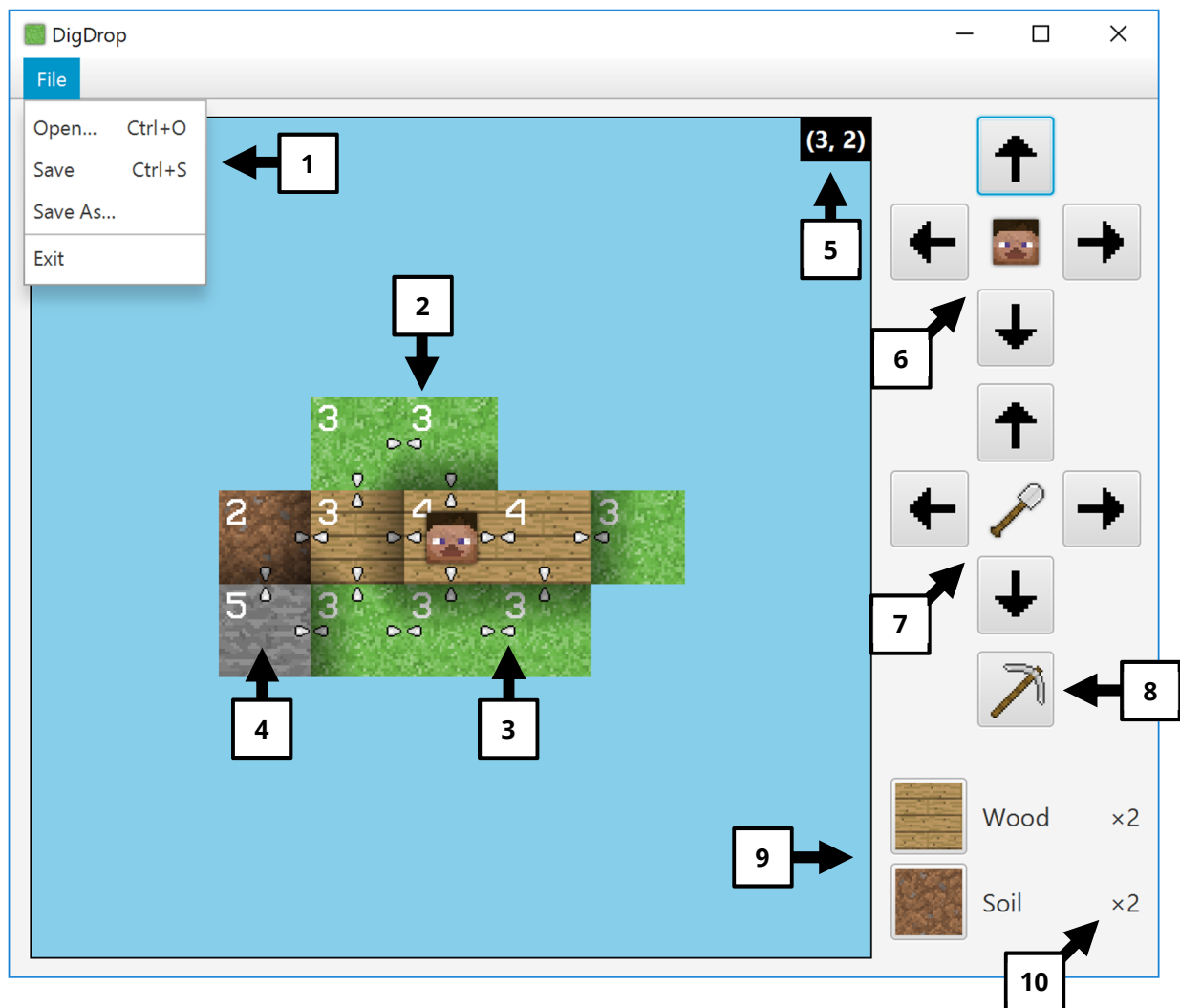
Note: Tile heights and exits have been shown by pressing Z and X.

1   File menu, with "Open…", "Save" and "Save As…" options

2   Number of blocks on each tile.

3   Small triangles represent exits from each tile.

4   Block type is clearly indicated by the image used.

5   Current position of the builder, as (x, y).

6   Buttons to move builder north, east, south and west.

7   Buttons to move the current top block north, east, south and west.

8   Button to dig on the current tile.

9   Buttons to place wood and soil blocks.

10   Number of wood and soil blocks remaining in the inventory.

Acknowledgements

With the exception of ao_n_full.png and ao_nw_corner.png, all images are from (or modified from) Vattic's Faithful32x32 Minecraft texture pack, as permitted by its usage guidelines. It can be found here:

https://www.minecraftforum.net/forums/mapping-and-modding-java-edition/resource-packs/1223254-faithful-32x32-pack-update-red-cat-clay-1-8

The ambient occlusion implementation was based off an algorithm described here:

https://0fps.net/2013/07/03/ambient-occlusion-for-minecraft-like-worlds/