Tacita’s JavaCraft - Provisional Report (Group 18)

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Group Details

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Group Number	18
TA	TA assigned to Group 18

Students

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Introduction

This project is perfect for improving our Java knowledge and to teach us how to collaborate in a team setting. For us this means how to efficiently divide tasks to each team member to maximize their participation in the project. It is also a good refresher on the DFA, which you can only really understand if you actually make one.

JavaCraft's Workflow

Class JavaCraft

Pseudocode

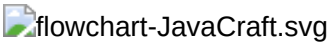
```
BEGIN

Define global constants/variables and assign values to some;
Initialize game by assigning some global variables;
Generate world with different blocks by using randomness;
PRINT INFO `instructions`;
PRINT INFO "Start the game? (Y/N): ";
IF `<String> READ user input` == y (caseless check)
    Set `<boolean> unlockMode` = false;
    Set `<boolean> craftingCommandEntered` = false;
    Set `<boolean> miningCommandEntered` = false;
    Set `<boolean> movementCommandEntered` = false;
    WHILE true
        PRINT INFO `initial UI containing legend, world, inventory`;
        PRINT INFO "Enter your action: 'WASD': Move, 'M': Mine, 'P': Place,
'C': Craft, 'I': Interact, 'Save': Save, 'Load': Load, 'Exit': Quit,
'Unlock': Unlock Secret Door\n" (colored in green);
        IF `<String> READ user input` == "w" OR "up" OR "s" OR "down" OR
"a" OR "left" OR "d" OR "right" (caseless check)
            IF `<boolean> unlockMode` == true
                Set `<boolean> movementCommandEntered` = true;
            Move player;
        ELSE IF `<String> READ user input` == "m" (caseless check)
            IF `<boolean> unlockMode` == true
                Set `<boolean> miningCommandEntered` = true;
            Mine block;
        ELSE IF `<String> READ user input` == "p" (caseless check)
            PRINT INFO `players inventory`;
            PRINT INFO "Enter the block type to place: ";
            Place block `<String> READ user input`;
        ELSE IF `<String> READ user input` == "c" (caseless check)
            PRINT INFO `crafting recipes`;
            PRINT INFO "Enter the recipe number to craft: ";
            Craft item `<String> READ user input`;
        ELSE IF `<String> READ user input` == "i" (caseless check)
            Interact with world;
        ELSE IF `<String> READ user input` == "save" (caseless check)
            PRINT INFO "Enter the file name to save the game state: ";
            Save game as `<String> READ user input`;
        ELSE IF `<String> READ user input` == "load" (caseless check)
            PRINT INFO "Enter the file name to load the game state: ";
            Load game from `<String> READ user input`;
        ELSE IF `<String> READ user input` == "exit" (caseless check)
```

```
            PRINT INFO "Exiting the game. Goodbye!\n";
            Exit game;
        ELSE IF `<String> READ user input` == "look" (caseless check)
            Print all blocks sorrounding player;
        ELSE IF `<String> READ user input` == "unlock" (caseless check)
            Set `<boolean> unlockMode` = true;
        ELSE IF `<String> READ user input` == "getflag" (caseless check)
            TRY TO
                Set up connection to a server;
                PRINT INFO " " + `<String> get country from server via a
POST request`;
                PRINT INFO " " + `<String> get quote from server via a POST
request`;
            ON EXCEPTION
                PRINT ERROR containing `stacktrace`;
                PRINT ERROR "Error connecting to the server";
            Wait on player to press ENTER;
        ELSE IF `<String> READ user input` == "open" (caseless check)
            IF `<boolean> unlockMode` == true AND `<boolean>
craftingCommandEntered` == true AND `<boolean> miningCommandEntered` ==
true AND `<boolean> movementCommandEntered` == true
                Set `<boolean> secretDoorUnlocked` = true;
                Reset world to an empty world;
                PRINT INFO "Secret door unlocked!\n";
                Wait on player to press ENTER;
            ELSE
                PRINT WARNING "Invalid passkey. Try again!\n";
                Set `<boolean> unlockMode` = false;
                Set `<boolean> craftingCommandEntered` = false;
                Set `<boolean> miningCommandEntered` = false;
                Set `<boolean> movementCommandEntered` = false;
        ELSE
            PRINT WARNING "Invalid input. Please try again." (colored in
yellow);
        IF `<boolean> unlockMode` == true
            IF `<String> READ user input` == "c" (caseless check)
                Set `<boolean> craftingCommandEntered` = true;
            IF `<String> READ user input` == "m" (caseless check)
                Set `<boolean> miningCommandEntered` = true;
        IF `<boolean> secretDoorUnlocked` == true
            PRINT INFO `description of current state`;
            Set `<boolean> inSecretArea` = true;
            Reset world to an empty world;
            Set `<boolean> secretDoorUnlocked` = false;
            Fill `<Integer list> inventory` with all available blockTypes;
            Wait on player to press ENTER;
ELSE
    Exit game;

END
```

Flowchart



Functionality Exploration

List of key functionalities explored.

- PLACEHOLDER
- PLACEHOLDER

Finite State Automata (FSA) Design

Secret door logic (boolean secretDoorUnlocked)

General description

The secret door logic is triggered when `<boolean> secretDoorUnlocked` is true and will replace the map with an empty map containing a dutch flag. It will also replace the green player symbol with a blue one.

The `<boolean> secretDoorUnlocked` is true if the player supplies the following input in order:

1. `y` (caseless check)
2. Nothing OR anything other than `exit` (caseless check)
3. `unlock` (caseless check)
4. Nothing OR anything other than `exit` (caseless check)
5. Mandatory `a`, `c` AND `m` plus optional `y` AND/OR `unlock` in any order (caseless check, repetition is possible)
6. Nothing OR anything other than `exit` (caseless check)
7. `open` (caseless check)

After point 7, the `<boolean> secretDoorUnlocked` is true and the secret door logic triggers.

Automaton

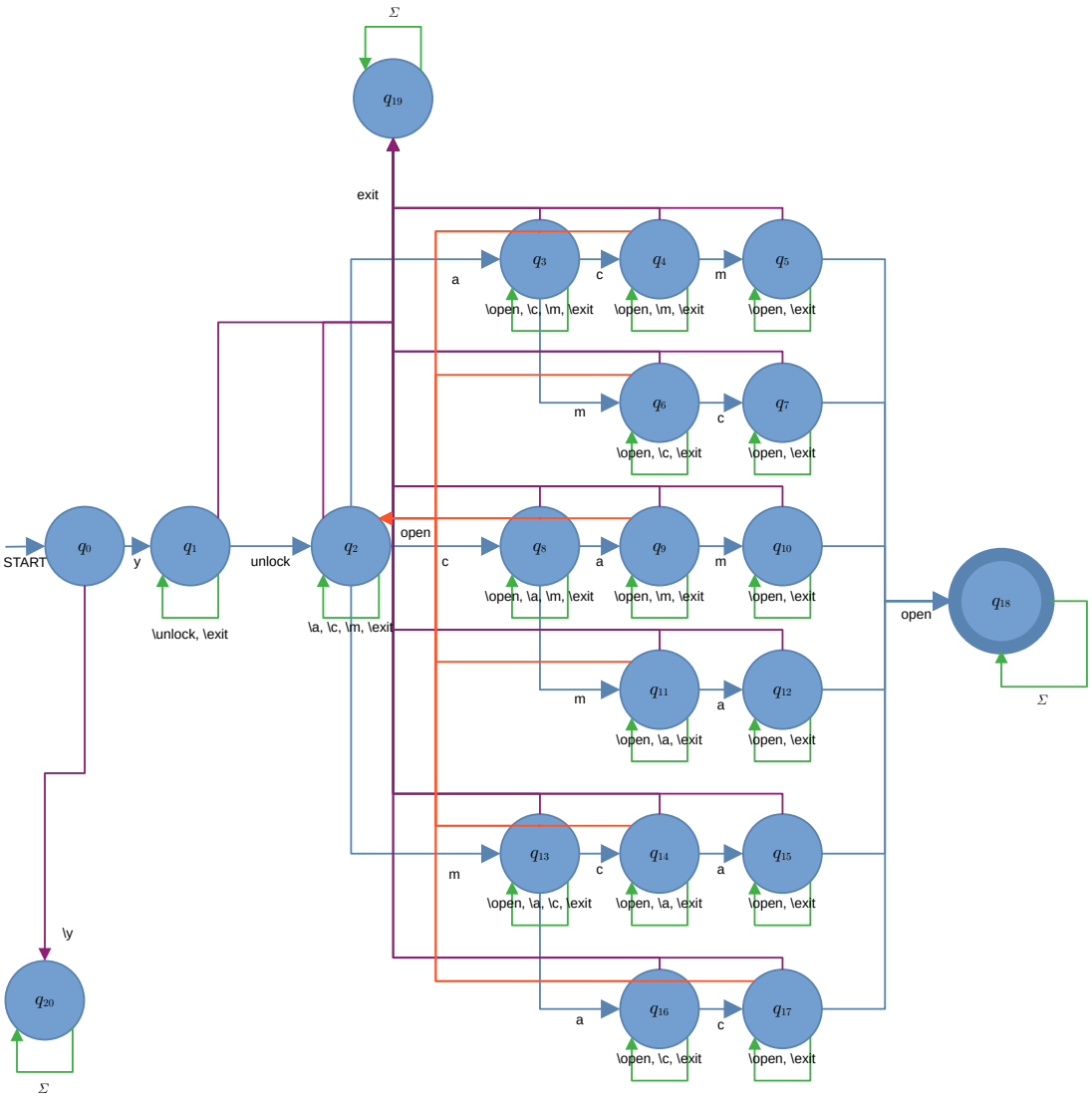
$$D=(Q, \Sigma, \delta, q_0, F)$$

$a=w, up, s, down, a, left, d, right$

$\Sigma=\{y, unlock, a, c, m, open, exit\}$ (caseless check)
δ: *Transition Function*

$L(D)=$ {y, unlock, {mandatory a, c, m and optional y, unlock in any order; repetition is possible}, open}
$Q=\{q_0, q_1, q_2, q_3, q_4, q_5, q_6, q_7, q_8, q_9, q_{10}, q_{11}, q_{12}, q_{13}, q_{14}, q_{15}, q_{16}, q_{17}, q_{18}, q_{19}, q_{20}\}$

$F=\{q_{18}\}$



Table

State	y	unlock	a	c	m	open	exit
$^{\rightarrow}q_0$	q_1	q_{20}	q_{20}	q_{20}	q_{20}	q_{20}	q_{20}
q_1	q_1	q_2	q_1	q_1	q_1	q_1	q_{19}
q_2	q_2	q_2	q_3	q_8	q_{13}	q_2	q_{19}
q_3	q_3	q_3	q_3	q_4	q_6	q_2	q_{19}
q_4	q_4	q_4	q_4	q_4	q_5	q_2	q_{19}
q_5	q_5	q_5	q_5	q_5	q_5	q_{18}	q_{19}
q_6	q_6	q_6	q_6	q_7	q_6	q_2	q_{19}
q_7	q_7	q_7	q_7	q_7	q_7	q_{18}	q_{19}
q_8	q_8	q_8	q_9	q_8	q_{11}	q_2	q_{19}
q_9	q_9	q_9	q_9	q_9	q_{10}	q_2	q_{19}
q_{10}	q_{10}	q_{10}	q_{10}	q_{10}	q_{10}	q_{18}	q_{19}
q_{11}	q_{11}	q_{11}	q_{12}	q_{11}	q_{11}	q_2	q_{19}
q_{12}	q_{12}	q_{12}	q_{12}	q_{12}	q_{12}	q_{18}	q_{19}
q_{13}	q_{13}	q_{13}	q_{16}	q_{14}	q_{13}	q_1	q_{19}
q_{14}	q_{14}	q_{14}	q_{15}	q_{14}	q_{14}	q_2	q_{19}
q_{15}	q_{15}	q_{15}	q_{15}	q_{15}	q_{15}	q_{18}	q_{19}
q_{16}	q_{16}	q_{16}	q_{16}	q_{17}	q_{16}	q_2	q_{19}
q_{17}	q_{17}	q_{17}	q_{17}	q_{17}	q_{17}	q_{18}	q_{19}
$^{*}q_{18}$	q_{18}	q_{18}	q_{18}	q_{18}	q_{18}	q_{18}	q_{18}
q_{19}	q_{19}	q_{19}	q_{19}	q_{19}	q_{19}	q_{19}	q_{19}
q_{20}	q_{20}	q_{20}	q_{20}	q_{20}	q_{20}	q_{20}	q_{20}

Git Collaboration & Version Control

- UM Gitlab Repository, Branch Group 18
- Changes & Conflicts
    - Merge conflicts were handled efficiently and quickly. As a team we all had our experiences with these conflicts, one example was that a local repository was a few key commits behind. This was solved by choosing what parts of the code to keep, and what parts of the code needed to be replaced by the newer version on the repository.
    - Some other issue we faced was not being able to merge in the first place, which was inevitably resolved by re-cloning the repository and pasting in our modified files, which we wanted to

replace older files on the remote repository.

Appendix

void clearScreen()

Java

```java
private static void clearScreen() {
    try {
        if (System.getProperty("os.name").contains("Windows")) {
            new ProcessBuilder("cmd", "/c",
"cls").inheritIO().start().waitFor();
        } else {
            System.out.print("\033[H\033[2J");
            System.out.flush();
        }
    } catch (IOException | InterruptedException ex) {
        ex.printStackTrace();
    }
}
```

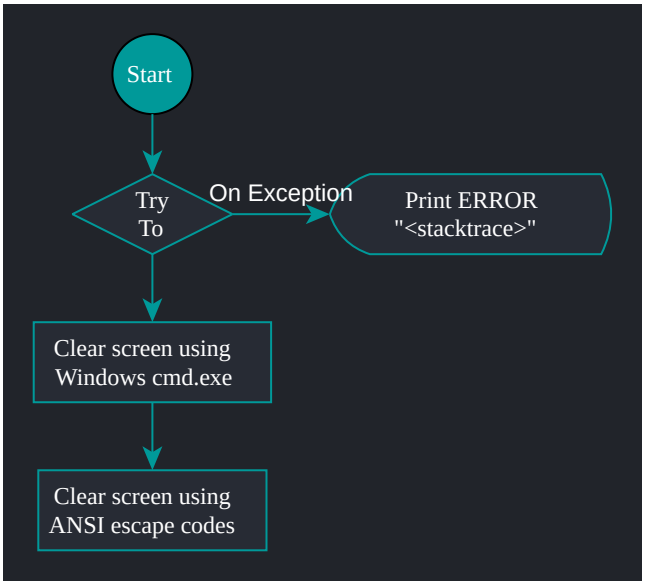
Pseudocode

```
BEGIN

TRY TO
    IF current operating system matches Windows
        Clear screen using Windows cmd.exe by calling "/c cls";
        Wait on process to finish;
    ELSE
        Clear screen using ANSI code;
ON EXCEPTION
    PRINT ERROR containing `stacktrace`;

END
```

Flowchart


Start
Try
To
On Exception
Print ERROR
"<stacktrace>"
Clear screen using
Windows cmd.exe
Clear screen using
ANSI escape codes

void craftIronIngot()

Java

```java
public static void craftIronIngot() {
    if (inventoryContains(IRON_ORE, 3)) {
        removeItemsFromInventory(IRON_ORE, 3);
        addCraftedItem(CRAFTED_IRON_INGOT);
        System.out.println("Crafted Iron Ingot.");
    } else {
        System.out.println("Insufficient resources to craft Iron Ingot.");
    }
}
```

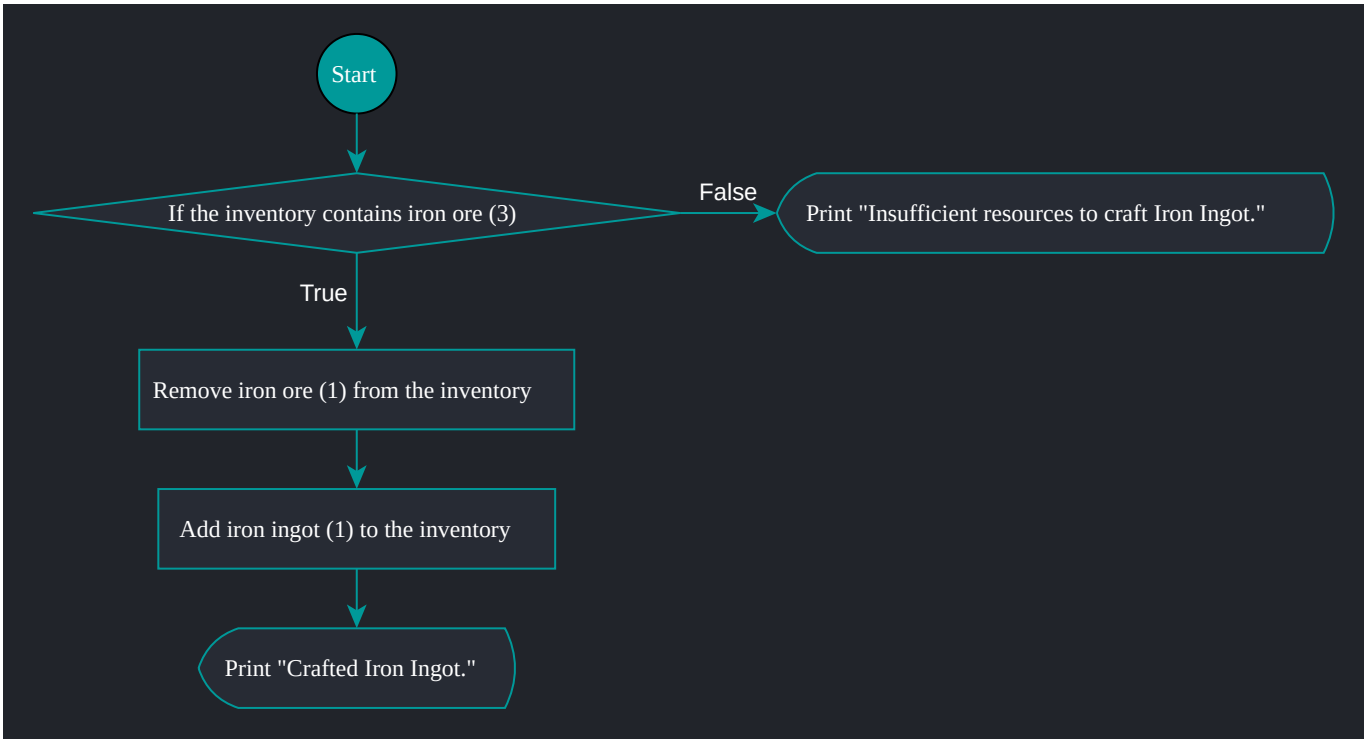
Pseudocode

```
BEGIN

IF `<list> inventory` contains at least 3 iron ore
    Remove 3 iron ore from `<list> inventory`;
    Add the crafted item 1 iron ingot to `<list> inventory`;
    PRINT INFO "Crafted Iron Ingot.\n";
ELSE
    PRINT WARNING "Insufficient resources to craft Iron Ingot.\n";

END
```

Flowchart


Start
If the inventory contains iron ore (3)
False
Print "Insufficient resources to craft Iron Ingot."
True
Remove iron ore (1) from the inventory
Add iron ingot (1) to the inventory
Print "Crafted Iron Ingot."

void craftItem(int recipe)

Java

```java
public static void craftItem(int recipe) {
    switch (recipe) {
        case 1:
            craftWoodenPlanks();
            break;
        case 2:
            craftStick();
            break;
        case 3:
            craftIronIngot();
            break;
        case 4:
            craftStonePickaxe();
            break;
        case 5:
            craftIronPickaxe();
            break;
        default:
            System.out.println("Invalid recipe number.");
    }
    waitForEnter();
}
```

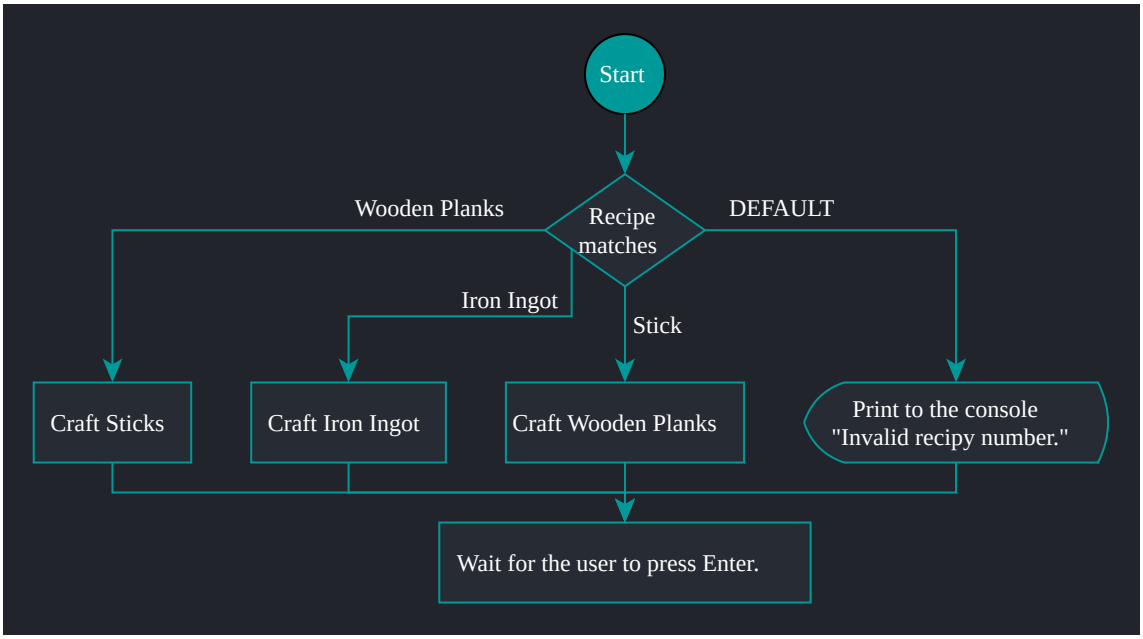
Pseudocode

```
BEGIN

IF `<Integer> recipe` == 1
    Craft wooden planks;
ELSE IF `<Integer> recipe` == 2
    Craft stick;
ELSE IF `<Integer> recipe` == 3
    Craft iron ingot;
ELSE IF `<Integer> recipe` == 4
    Craft stone pickaxe;
ELSE IF `<Integer> recipe` == 5
    Craft iron pickaxe;
ELSE
    PRINT WARNING "Invalid recipe number.\n";
Wait on player to press ENTER;

END
```

Flowchart


Start
Recipe matches
Wooden Planks
Iron Ingot
Stick
DEFAULT
Craft Sticks
Craft Iron Ingot
Craft Wooden Planks
Print to the console "Invalid recipy number."
Wait for the user to press Enter.

void craftStick()

Java

```java
public static void craftStick() {
    if (inventoryContains(WOOD)) {
        removeItemsFromInventory(WOOD, 1);
        addCraftedItem(CRAFTED_STICK);
        System.out.println("Crafted Stick.");
    } else {
        System.out.println("Insufficient resources to craft Stick.");
    }
}
```

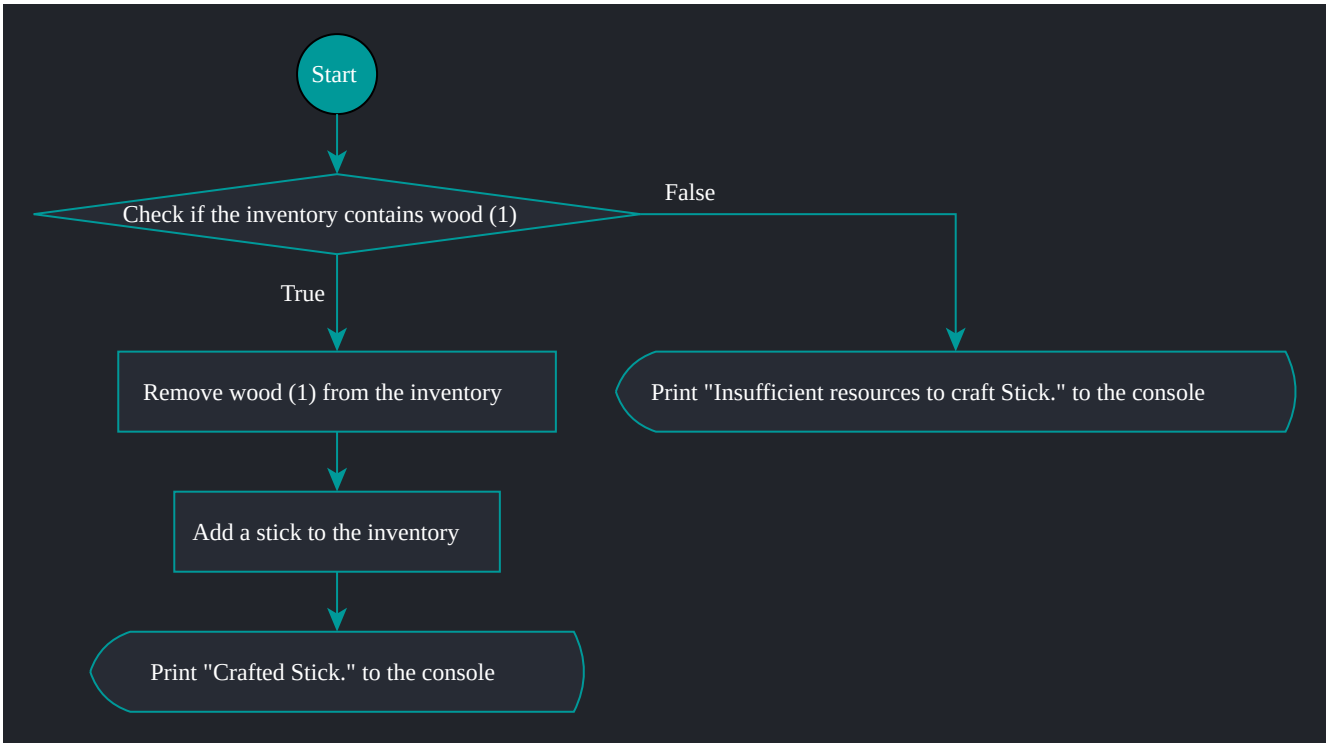
Pseudocode

```
BEGIN

IF `<list> inventory` contains wood
    Remove 1 wood from `<list> inventory`;
    Add the crafted item 1 stick to `<list> inventory`;
    PRINT INFO "Crafted Stick.\n";
ELSE
    PRINT WARNING "Insufficient resources to craft Stick.\n";

END
```

Flowchart


Start
Check if the inventory contains wood (1)
False
True
Remove wood (1) from the inventory
Print "Insufficient resources to craft Stick." to the console
Add a stick to the inventory
Print "Crafted Stick." to the console

void craftWoodenPlanks()

Java

```java
public static void craftWoodenPlanks() {
    if (inventoryContains(WOOD, 2)) {
        removeItemsFromInventory(WOOD, 2);
        addCraftedItem(CRAFTED_WOODEN_PLANKS);
        System.out.println("Crafted Wooden Planks.");
    } else {
        System.out.println("Insufficient resources to craft Wooden
Planks.");
    }
}
```

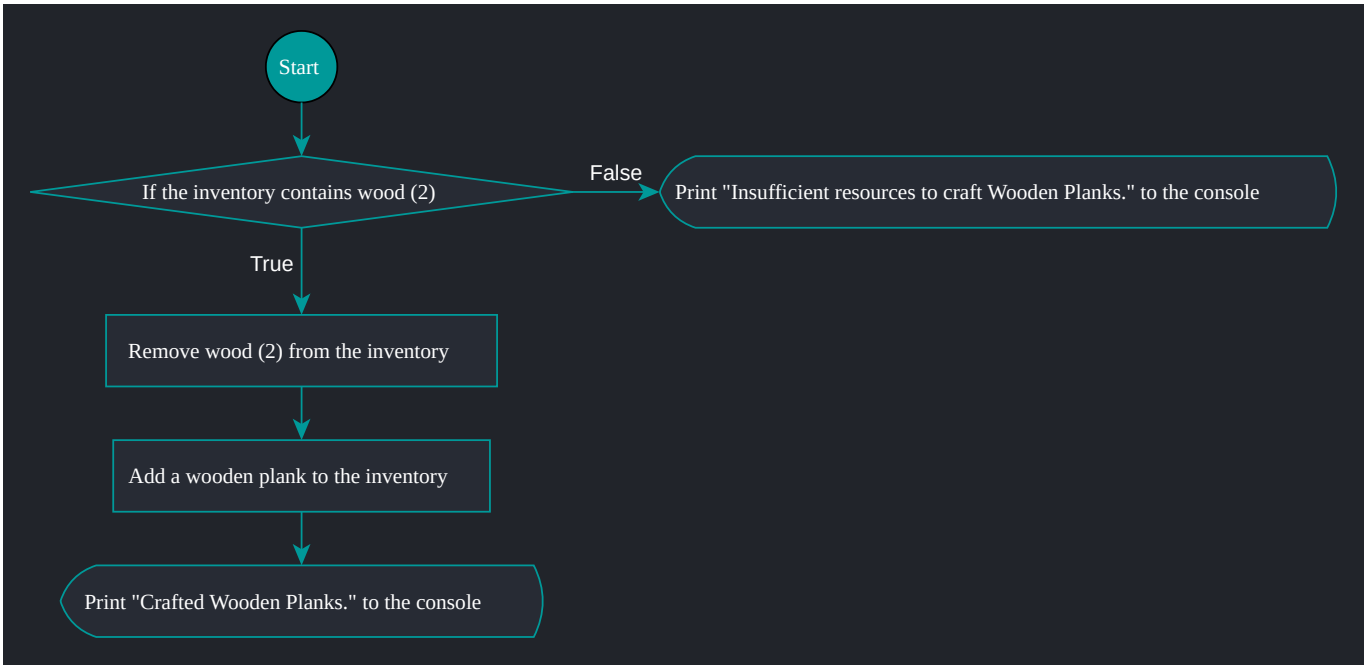
Pseudocode

```
BEGIN

IF `<list> inventory` contains at least 2 wood
    Remove 2 wood from `<list> inventory`;
    Add the crafted item 1 wooden planks to `<list> inventory`;
    PRINT INFO "Crafted Wooden Planks.\n";
ELSE
    PRINT WARNING "Insufficient resources to craft Wooden Planks.\n";

END
```

Flowchart


Start
If the inventory contains wood (2)
False
Print "Insufficient resources to craft Wooden Planks." to the console
True
Remove wood (2) from the inventory
Add a wooden plank to the inventory
Print "Crafted Wooden Planks." to the console

void displayCraftingRecipes()

Java

```java
public static void displayCraftingRecipes() {
    System.out.println("Crafting Recipes:");
    System.out.println("1. Craft Wooden Planks: 2 Wood");
    System.out.println("2. Craft Stick: 1 Wood");
    System.out.println("3. Craft Iron Ingot: 3 Iron Ore");
    System.out.println("4. Craft Stone Pickaxe: 1 Stick, 3 Stone");
    System.out.println("5. Craft Iron Pickaxe: 1 Stick, 3 Iron Ingot");
}
```

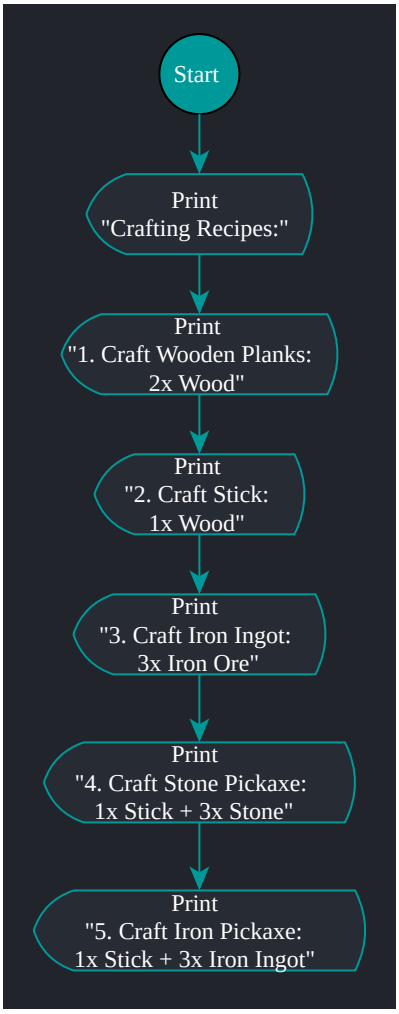
Pseudocode

```
BEGIN

PRINT INFO "Crafting Recipes:\n";
PRINT INFO "1. Craft Wooden Planks: 2 Wood\n";
PRINT INFO "2. Craft Stick: 1 Wood\n";
PRINT INFO "3. Craft Iron Ingot: 3 Iron Ore\n";
PRINT INFO "4. Craft Stone Pickaxe: 1 Stick, 3 Stone\n";
PRINT INFO "5. Craft Iron Pickaxe: 1 Stick, 3 Iron Ingot\n";

END
```

Flowchart


Start
Print "Crafting Recipes:"
Print "1. Craft Wooden Planks: 2x Wood"
Print "2. Craft Stick: 1x Wood"
Print "3. Craft Iron Ingot: 3x Iron Ore"
Print "4. Craft Stone Pickaxe: 1x Stick + 3x Stone"
Print "5. Craft Iron Pickaxe: 1x Stick + 3x Iron Ingot"

void displayInventory()

Java

```
public static void displayInventory() {
    System.out.println("Inventory:");
    if (inventory.isEmpty()) {
        System.out.println(ANSI_YELLOW + "Empty" + ANSI_RESET);
    } else {
        int[] blockCounts = new int[7];
        for (int i = 0; i < inventory.size(); i++) {
            int block = inventory.get(i);
            blockCounts[block]++;
        }
        for (int blockType = 1; blockType < blockCounts.length;
blockType++) {
            int occurrences = blockCounts[blockType];
            if (occurrences > 0) {
                System.out.println(getBlockName(blockType) + " - " +
occurrences);
            }
        }
    }
    System.out.println("Crafted Items:");
    if (craftedItems == null || craftedItems.isEmpty()) {
        System.out.println(ANSI_YELLOW + "None" + ANSI_RESET);
    } else {
        for (int item : craftedItems) {
            System.out.print(
                    getCraftedItemColor(item) + getCraftedItemName(item) +
", " + ANSI_RESET);
        }
        System.out.println();
    }
    System.out.println();
}
```

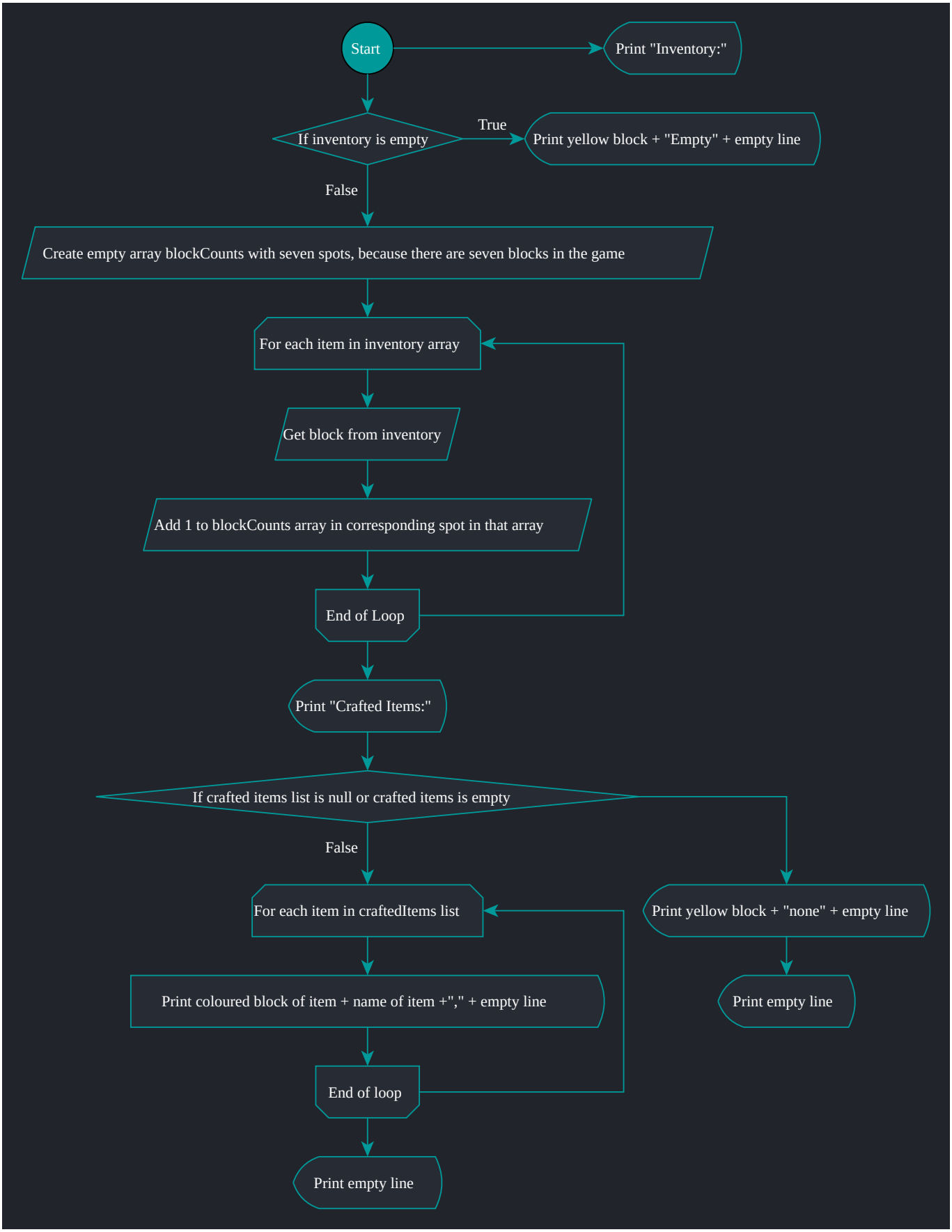
Pseudocode

```
BEGIN

PRINT INFO "Inventory:\n";
IF `<Integer list> inventory` is empty
    PRINT INFO "Empty\n" (colored in yellow);
ELSE
    CREATE `<Integer array> blockCounts` of size 7;
    FOR EACH `<Integer> element` in `<Integer list> inventory`
        Assign `<Integer> block` = `<Integer> element`;
        Set `<Integer array> blockCounts @ index <Integer> block` += 1;
    FOR `<Integer> blockType` = 1; `<Integer> blockType` < `length of
<Integer array> blockCounts`
        Assign `<Integer> occurences` = `<Integer array> blockCounts @
index <Integer> blockType`;
        IF `<Integer> occurences` > 0
            PRINT INFO `<String> get block name matching <Integer>
blockType` + " - " + `<Integer> occurences\n`;
        Set `<Integer> blockType` += 1;
PRINT INFO "Crafted Items:\n";
IF `<Integer list> craftedItems` is non-existant or empty
    PRINT INFO "None\n" (colored in yellow);
ELSE
    FOR EACH `<Integer> item` in `<Integer list> craftedItems`
        PRINT INFO `<String> get name matching <Integer> item` + ", "
(colored in `<String> get color matching <Integer> item`);
    PRINT INFO "\n";
PRINT INFO "\n";

END
```

Flowchart


Start
Print "Inventory:"
If inventory is empty
True
Print yellow block + "Empty" + empty line
False
Create empty array blockCounts with seven spots, because there are seven blocks in the game
For each item in inventory array
Get block from inventory
Add 1 to blockCounts array in corresponding spot in that array
End of Loop
Print "Crafted Items:"
If crafted items list is null or crafted items is empty
False
For each item in craftedItems list
Print coloured block of item + name of item +"," + empty line
End of loop
Print empty line
Print yellow block + "none" + empty line
Print empty line

void fillInventory()

Java

```java
private static void fillInventory() {
    inventory.clear();
    for (int blockType = 1; blockType <= 6; blockType++) {
        for (int i = 0; i < INVENTORY_SIZE; i++) {
            inventory.add(blockType);
        }
    }
}
```

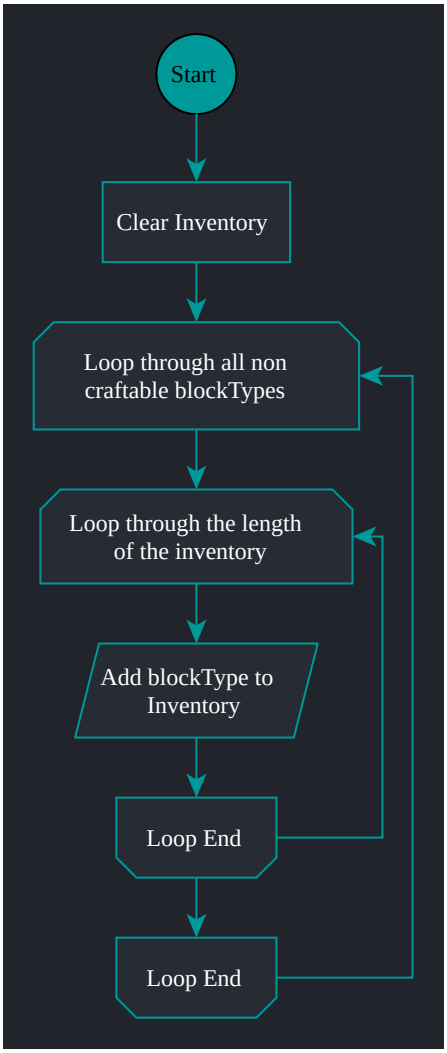
Pseudocode

```
BEGIN

Clear `<Integer list> inventory`;
FOR `<Integer> blockType` = 1; `<Integer> blockType` <= 6
    FOR EACH `<Integer> element` in `<Integer list> inventory`
        Set `<Integer> member` = `<Integer> blockType`;
    Set `<Integer> blockType` += 1;

END
```

Flowchart


Start
Clear Inventory
Loop through all non craftable blockTypes
Loop through the length of the inventory
Add blockType to Inventory
Loop End
Loop End

void generateWorld()

Java

```java
public static void generateWorld() {
    Random rand = new Random();
    for (int y = 0; y < worldHeight; y++) {
        for (int x = 0; x < worldWidth; x++) {
            int randValue = rand.nextInt(100);
            if (randValue < 17) {
                world[x][y] = WOOD;
            } else if (randValue < 30) {
                world[x][y] = LEAVES;
            } else if (randValue < 45) {
                world[x][y] = STONE;
            } else if (randValue < 57) {
                world[x][y] = COAL_ORE;
            } else if (randValue < 65) {
                world[x][y] = IRON_ORE;
            } else if (randValue < 70) {
                world[x][y] = EMERALD_ORE;
            } else {
                world[x][y] = AIR;
            }
        }
    }
}
```

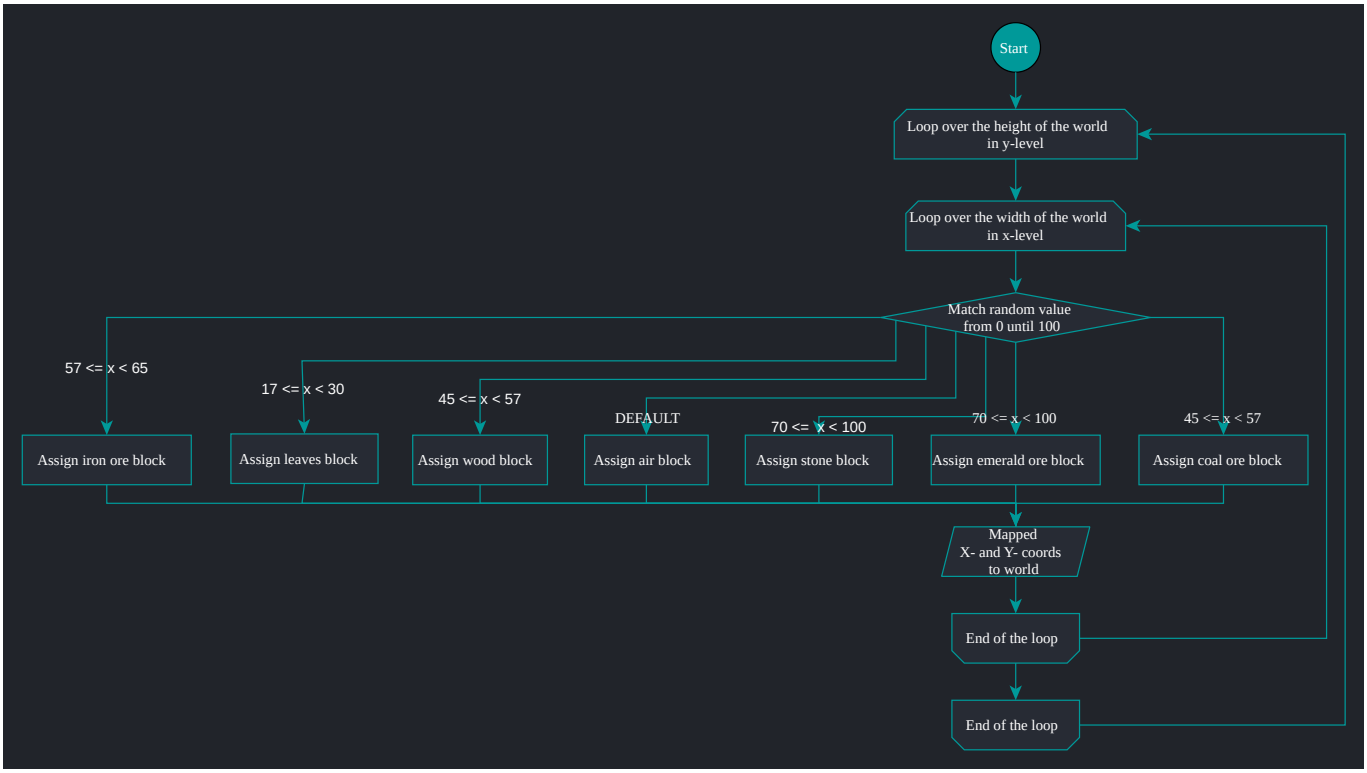
Pseudocode

```
BEGIN

FOR `<Integer> y` = 0; `<Integer> y` < `<Integer> worldHeight`
    FOR `<Integer> x` = 0; `<Integer> x` < `<Integer> worldWidth`
        Assign `<Integer> randValue` = `random value between 0 and 99`;
        IF `<Integer> randValue` < 17
            Set `<two dimensional Integer array> world @ indexes <Integer>
x, <Integer> y` = `<Integer> wood`;
        ELSE IF `<Integer> randValue` < 30
            Set `<two dimensional Integer array> world @ indexes <Integer>
x, <Integer> y` = `<Integer> leaves`;
        ELSE IF `<Integer> randValue` < 45
            Set `<two dimensional Integer array> world @ indexes <Integer>
x, <Integer> y` = `<Integer> stone`;
        ELSE IF `<Integer> randValue` < 57
            Set `<two dimensional Integer array> world @ indexes <Integer>
x, <Integer> y` = `<Integer> coal ore`;
        ELSE IF `<Integer> randValue` < 65
            Set `<two dimensional Integer array> world @ indexes <Integer>
x, <Integer> y` = `<Integer> iron ore`;
        ELSE IF `<Integer> randValue` < 70
            Set `<two dimensional Integer array> world @ indexes <Integer>
x, <Integer> y` = `<Integer> emerald ore`;
        ELSE
            Set `<two dimensional Integer array> world @ indexes <Integer>
x, <Integer> y` = `<Integer> air`;
        Set `<Integer> x` += 1;
    Set `<Integer> y` += 1;

END
```

Flowchart


Start
Loop over the height of the world in y-level
Loop over the width of the world in x-level
Match random value from 0 until 100
57 <= x < 65
17 <= x < 30
45 <= x < 57
DEFAULT
70 <= x < 100
70 <= x < 100
45 <= x < 57
Assign iron ore block
Assign leaves block
Assign wood block
Assign air block
Assign stone block
Assign emerald ore block
Assign coal ore block
Mapped X- and Y- coords to world
End of the loop
End of the loop

char getBlockChar(int blockType)

Java

```java
private static char getBlockChar(int blockType) {
    switch (blockType) {
        case WOOD:
            return '\u2592';
        case LEAVES:
            return '\u00A7';
        case STONE:
            return '\u2593';
        case IRON_ORE:
            return '\u00B0';
        case COAL_ORE:
            return '\u2593';
        case EMERALD_ORE:
            return '\u00B0';
        default:
            return '-';
    }
}
```

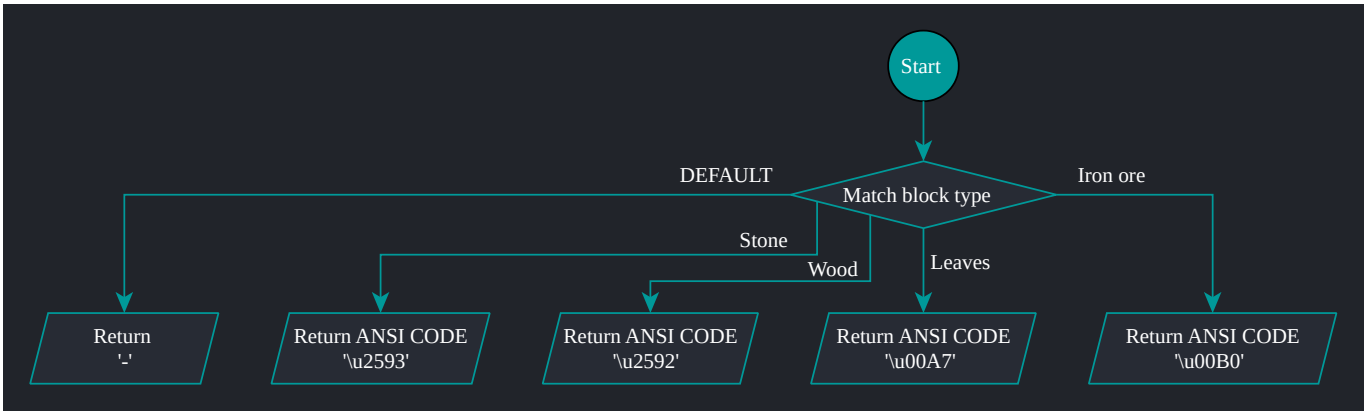
Pseudocode

```
BEGIN

IF `<Integer> blockType` == `<Integer> wood`
    RETURN `<Character> medium shade`;
ELSE IF `<Integer> blockType` == `<Integer> leaves`
    RETURN `<Character> section sign`;
ELSE IF `<Integer> blockType` == `<Integer> stone`
    RETURN `<Character> dark shade`;
ELSE IF `<Integer> blockType` == `<Integer> iron ore`
    RETURN `<Character> degree sign`;
ELSE IF `<Integer> blockType` == `<Integer> coal ore`
    RETURN `<Character> dark shade`;
ELSE IF `<Integer> blockType` == `<Integer> emerald ore`
    RETURN `<Character> degree sign`;
ELSE
    RETURN `<Character> -`;

END
```

Flowchart


Start
Match block type
DEFAULT
Iron ore
Stone
Wood
Leaves
Return
'-'
Return ANSI CODE
'\u2593'
Return ANSI CODE
'\u2592'
Return ANSI CODE
'\u00A7'
Return ANSI CODE
'\u00B0'

String getBlockName(int blockType)

Java

```java
private static String getBlockName(int blockType) {
    switch (blockType) {
        case AIR:
            return "Empty Block";
        case WOOD:
            return "Wood";
        case LEAVES:
            return "Leaves";
        case STONE:
            return "Stone";
        case IRON_ORE:
            return "Iron Ore";
        case COAL_ORE:
            return "Coal Ore";
        case EMERALD_ORE:
            return "Emerald Ore";
        default:
            return "Unknown";
    }
}
```

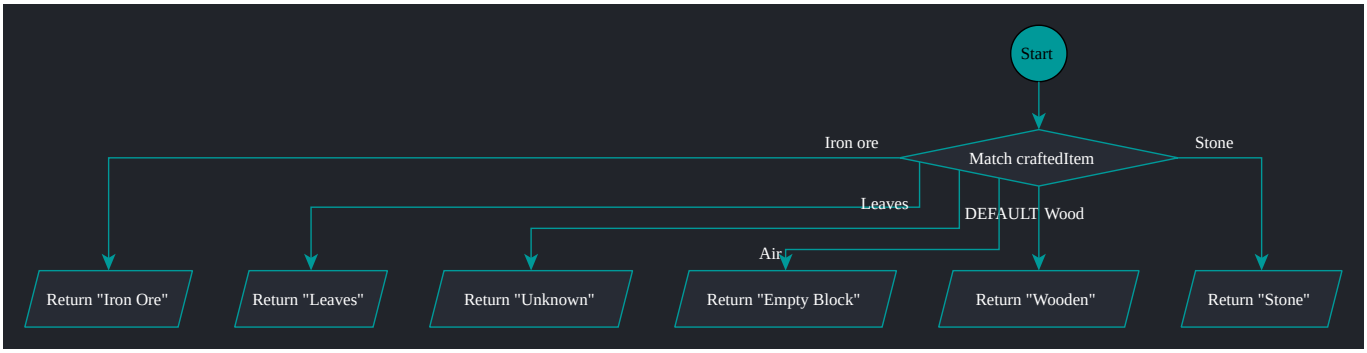
Pseudocode

```
BEGIN

IF `<Integer> blockType` == `<Integer> air`
    RETURN "Empty Block";
ELSE IF `<Integer> blockType` == `<Integer> wood`
    RETURN "Wood";
ELSE IF `<Integer> blockType` == `<Integer> leaves`
    RETURN "Leaves";
ELSE IF `<Integer> blockType` == `<Integer> stone`
    RETURN "Stone";
ELSE IF `<Integer> blockType` == `<Integer> iron ore`
    RETURN "Iron Ore";
ELSE IF `<Integer> blockType` == `<Integer> coal ore`
    RETURN "Coal Ore";
ELSE IF `<Integer> blockType` == `<Integer> emerald ore`
    RETURN "Emerald Ore";
ELSE
    RETURN "Unknown";

END
```

Flowchart


Start
Match craftedItem
Iron ore
Stone
Leaves
DEFAULT
Wood
Air
Return "Iron Ore"
Return "Leaves"
Return "Unknown"
Return "Empty Block"
Return "Wooden"
Return "Stone"

String getBlockSymbol(int blockType)

Java

```java
private static String getBlockSymbol(int blockType) {
    String blockColor;
    switch (blockType) {
        case AIR:
            return ANSI_RESET + "- ";
        case WOOD:
            blockColor = ANSI_RED;
            break;
        case LEAVES:
            blockColor = ANSI_GREEN;
            break;
        case STONE:
            blockColor = ANSI_BLUE;
            break;
        case IRON_ORE:
            blockColor = ANSI_WHITE;
            break;
        case COAL_ORE:
            blockColor = ANSI_COAL_GRAY;
            break;
        case EMERALD_ORE:
            blockColor = ANSI_EMERALD_GREEN;
            break;
        default:
            blockColor = ANSI_RESET;
            break;
    }
    return blockColor + getBlockChar(blockType) + " ";
}
```

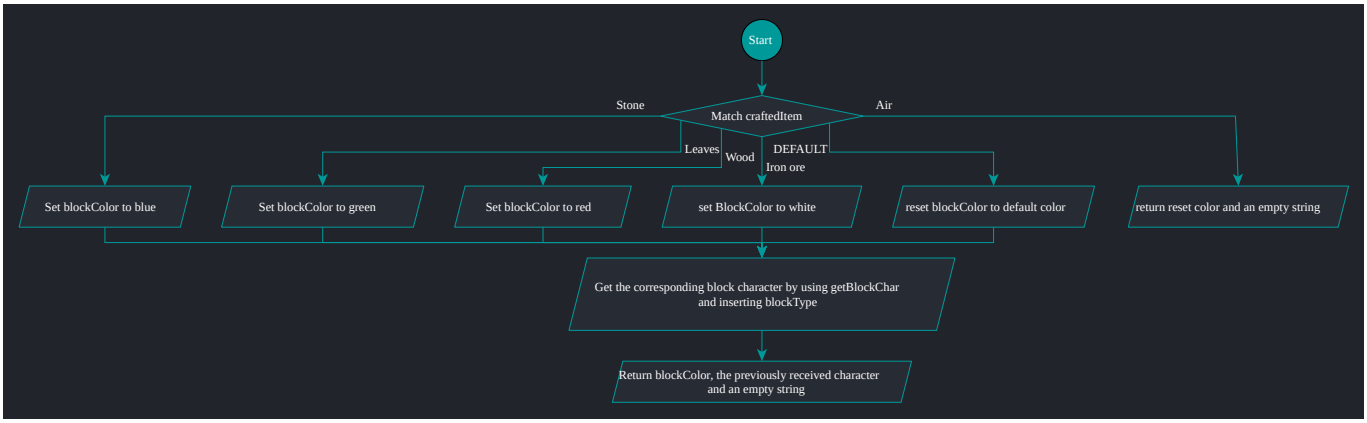
Pseudocode

```
BEGIN

Define `<String> blockColor`;
IF `<Integer> blockType` == `<Integer> air`
    RETURN "Empty Block";
ELSE IF `<Integer> blockType` == `<Integer> wood`
    Set `<String> blockColor` = `(color red)`;
ELSE IF `<Integer> blockType` == `<Integer> leaves`
    Set `<String> blockColor` = `(color green)`;
ELSE IF `<Integer> blockType` == `<Integer> stone`
    Set `<String> blockColor` = `(color blue)`;
ELSE IF `<Integer> blockType` == `<Integer> iron ore`
    Set `<String> blockColor` = `(color white)`;
ELSE IF `<Integer> blockType` == `<Integer> coal ore`
    Set `<String> blockColor` = `(color coal gray)`;
ELSE IF `<Integer> blockType` == `<Integer> emerald ore`
    Set `<String> blockColor` = `(color emerald green)`;
ELSE
    Set `<String> blockColor` = `(reset color)`;
RETURN `<String> blockColor` + `<Character> get symbol matching blockType`
+ " ";

END
```

Flowchart


Start
Match craftedItem
Stone
Air
Leaves
Wood
Iron ore
DEFAULT
Set blockColor to blue
Set blockColor to green
Set blockColor to red
set BlockColor to white
reset blockColor to default color
return reset color and an empty string
Get the corresponding block character by using getBlockChar and inserting blockType
Return blockColor, the previously received character and an empty string

String getCraftedItemName(int craftedItem)

Java

```java
private static String getCraftedItemName(int craftedItem) {
    switch (craftedItem) {
        case CRAFTED_WOODEN_PLANKS:
            return "Wooden Planks";
        case CRAFTED_STICK:
            return "Stick";
        case CRAFTED_IRON_INGOT:
            return "Iron Ingot";
        case CRAFTED_STONE_PICKAXE:
            return "Stone Pickaxe";
        case CRAFTED_IRON_PICKAXE:
            return "Iron Pickaxe";
        default:
            return "Unknown";
    }
}
```

Pseudocode

```
BEGIN

IF `<Integer> craftedItem` == `<Integer> wooden planks`
    RETURN "Wooden Planks";
ELSE IF `<Integer> blockType` == `<Integer> stick`
    RETURN "Stick";
ELSE IF `<Integer> blockType` == `<Integer> iron ingot`
    RETURN "Iron Ingot";
ELSE IF `<Integer> blockType` == `<Integer> stone pickaxe`
    RETURN "Stone Pickaxe";
ELSE IF `<Integer> blockType` == `<Integer> iron pickaxe`
    RETURN "Iron Pickaxe";
ELSE
    RETURN "Unknown";

END
```

Flowchart


Start
compare craftedItem to hardcoded values
in the case that BlockName AIR
in the case that blockType is WOOD
in the case that blockType LEAVES
in the case that blockType STONE
in the case that blockType does not correspond to any hardcoded values
in the case that blockType IRON_ORE
return "Empty Block"
return "Wooden"
return "Leaves"
return "Stone"
return "Unknown"
return "Iron Ore"

void loadGame(String fileName)

Java

```
public static void loadGame(String fileName) {
    // Implementation for loading the game state from a file goes here
    try (ObjectInputStream inputStream = new ObjectInputStream(new
FileInputStream(fileName))) {
        // Deserialize game state data from the file and load it into the
program
        NEW_WORLD_WIDTH = inputStream.readInt();
        NEW_WORLD_HEIGHT = inputStream.readInt();
        world = (int[][]) inputStream.readObject();
        playerX = inputStream.readInt();
        playerY = inputStream.readInt();
        inventory = (List<Integer>) inputStream.readObject();
        craftedItems = (List<Integer>) inputStream.readObject();
        unlockMode = inputStream.readBoolean();
        System.out.println("Game state loaded from file: " + fileName);
    } catch (IOException | ClassNotFoundException e) {
        System.out.println("Error while loading the game state: " +
e.getMessage());
    }
    waitForEnter();
}
```

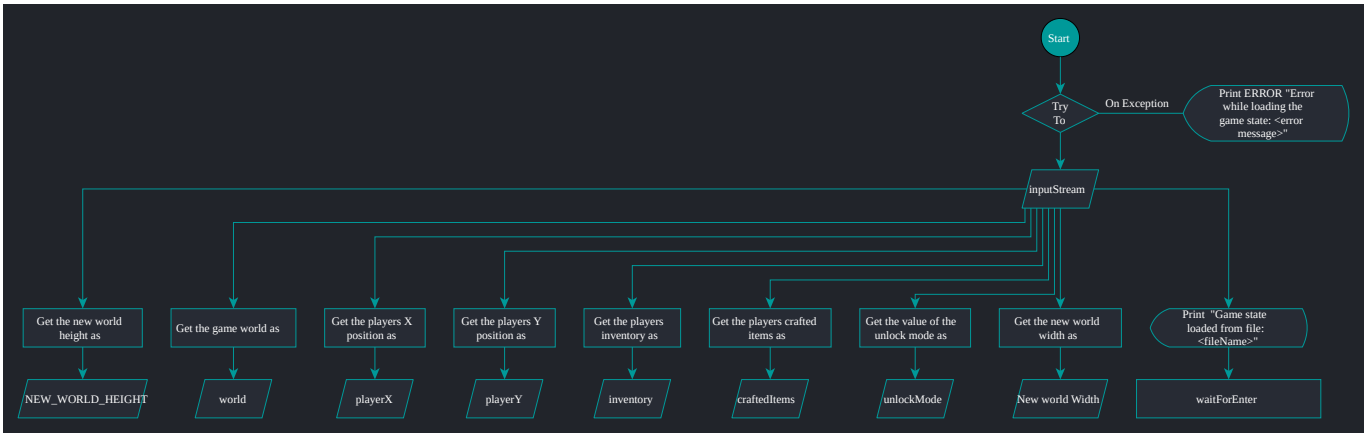
Pseudocode

```
BEGIN

TRY TO
    Set `<stream> inputStream` = `<stream> of contents from file matching
<String> fileName relative to current working directory`;
    Set `<Integer> NEW_WORLD_WIDTH` = `<Integer> get next line containing
serialized <Integer> in <stream> inputStream`;
    Set `<Integer> NEW_WORLD_HEIGHT` = `<Integer> get next line containing
serialized <Integer> in <stream> inputStream`;
    Set `<two dimensional Integer array> world` = `<two dimensional Integer
array> get next line containing any serialized object in <stream>
inputStream`;
    Set `<Integer> playerX` = `<Integer> get next line containing
serialized <Integer> in <stream> inputStream`;
    Set `<Integer> playerY` = `<Integer> get next line containing
serialized <Integer> in <stream> inputStream`;
    Set `<Integer list> inventory` = `<Integer list> get next line
containing any serialized object in <stream> inputStream` and cast to
<Integer list>;
    Set `<Integer list> craftedItems` = `<Integer list> get next line
containing any serialized object in <stream> inputStream`  and cast to
<Integer list>;
    Set `<boolean> unlockMode` = `<boolean> get next line containing
serialized <boolean> in <stream> inputStream`;
    PRINT INFO "Game state loaded from file: " + `<String> fileName` +
"\n";
    Close `<stream> inputStream`;
ON EXCEPTION
    PRINT ERROR "Error while loading the game state: " + `errormessage` +
"\n";
    Close `<stream> inputStream`;
Wait on player to press ENTER;

END
```

Flowchart


Start
Try
To
On Exception
Print ERROR "Error while loading the game state: <error message>"
inputStream
Get the new world height as
Get the game world as
Get the players X position as
Get the players Y position as
Get the players inventory as
Get the players crafted items as
Get the value of the unlock mode as
Get the new world width as
Print "Game state loaded from file: <fileName>"
NEW_WORLD_HEIGHT
world
playerX
playerY
inventory
craftedItems
unlockMode
New world Width
waitForEnter

void lookAround()

Java

```
private static void lookAround() {
    System.out.println("You look around and see:");
    for (int y = Math.max(0, playerY - 1); y <= Math.min(playerY + 1,
worldHeight - 1); y++) {
        for (int x = Math.max(0, playerX - 1); x <= Math.min(playerX + 1,
                worldWidth - 1); x++) {
            if (x == playerX && y == playerY) {
                System.out.print(ANSI_GREEN + "P " + ANSI_RESET);
            } else {
                System.out.print(getBlockSymbol(world[x][y]) + ANSI_RESET);
            }
        }
        System.out.println();
    }
    System.out.println();
    waitForEnter();
}
```

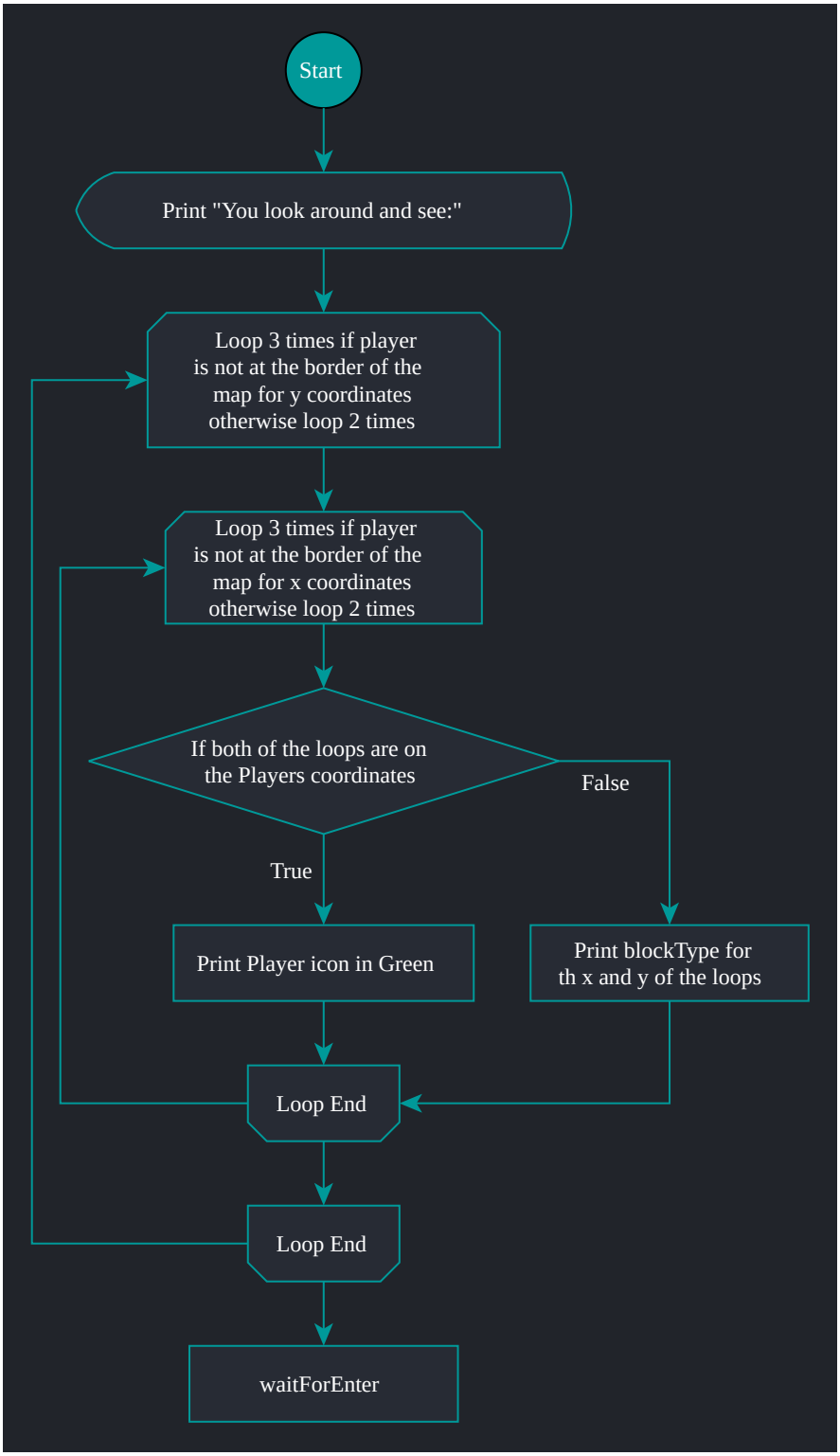
Pseudocode

```
BEGIN

PRINT INFO "You look around and see:";
FOR `<Integer> y` = `Maximum of (0) and (<Integer> playerY - 1)`;
`<Integer> y` <= `Minimum of (<Integer> playerY + 1) and (<Integer>
worldHeight - 1)`
    FOR `<Integer> x` = `Maximum of (0) and (<Integer> playerX - 1)`;
`<Integer> x` <= `Minimum of (<Integer> playerX + 1) and (<Integer>
worldWidth - 1)`
        IF `<Integer> x` == `<Integer> playerX` AND `<Integer> y` ==
`<Integer> playerY`
            PRINT INFO "P " (colored green);
        ELSE
            PRINT INFO `get block symbol from <two dimensional Integer
array> world @ indexes <Integer> x, <Integer> y`;
        Set `<Integer> x` += 1;
    PRINT INFO "\n";
    Set `<Integer> y` += 1;
PRINT INFO "\n";
Wait on player to press ENTER;

END
```

Flowchart


Start
Print "You look around and see:"
Loop 3 times if player is not at the border of the map for y coordinates otherwise loop 2 times
Loop 3 times if player is not at the border of the map for x coordinates otherwise loop 2 times
If both of the loops are on the Players coordinates
False
True
Print Player icon in Green
Print blockType for th x and y of the loops
Loop End
Loop End
waitForEnter

void placeBlock(int blockType)

Java

```
public static void placeBlock(int blockType) {
    if (blockType >= 0 && blockType <= 11) {
        if (blockType <= 6) {
            if (inventory.contains(blockType)) {
                inventory.remove(Integer.valueOf(blockType));
                world[playerX][playerY] = blockType;
                System.out.println("Placed " + getBlockName(blockType) + "
at your position.");
            } else {
                System.out.println(
                        "You don't have " + getBlockName(blockType) + " in
your inventory.");
            }
        } else {
            int craftedItem = getCraftedItemFromBlockType(blockType);
            if (craftedItems.contains(craftedItem)) {
                craftedItems.remove(Integer.valueOf(craftedItem));
                world[playerX][playerY] = blockType;
                System.out.println(
                        "Placed " + getCraftedItemName(craftedItem) + " at
your position.");
            } else {
                System.out.println("You don't have " +
getCraftedItemName(craftedItem)
                        + " in your crafted items.");
            }
        }
    } else {
        System.out.println("Invalid block number. Please enter a valid
block number.");
        System.out.println(BLOCK_NUMBERS_INFO);
    }
    waitForEnter();
}
```

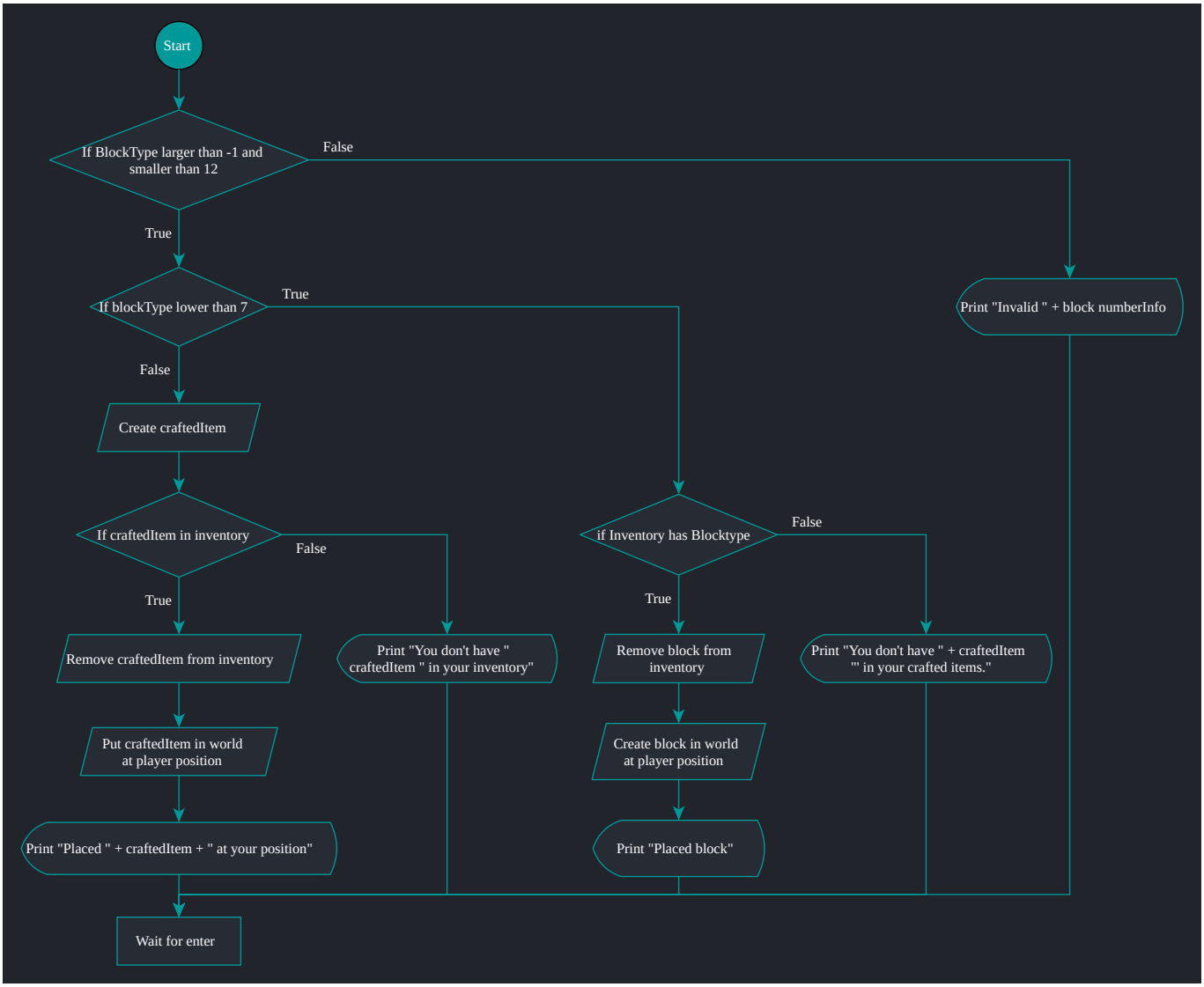
Pseudocode

```
BEGIN

IF `<Integer> blockType` >= 0 AND `<Integer> blockType` <= 11
    IF `<Integer> blockType` <= 6
        IF `<Integer list> inventory` contains `<Integer>` blockType
            Remove member `<Integer>` blockType from `<Integer list>
inventory`;
            Set `<two dimensional Integer array> world @ indexes <Integer>
playerX, <Integer> playerY` = `<Integer>` blockType;
            PRINT INFO "Placed " + `<String> get block name matching
<Integer> blockType` + " at your position.";
        ELSE
            PRINT WARNING "You don't have " + `<String> get block name
matching <Integer> blockType` + " in your inventory.";
    ELSE
        Assign `<Integer> craftedItem` = `<Integer> get crafted item of
<Integer> blockType`;
        IF `<Integer list> craftedItems` contains `<Integer>` craftedItem
            Remove member `<Integer>` craftedItem from `<Integer list>
craftedItems`;
            Set `<two dimensional Integer array> world @ indexes <Integer>
playerX, <Integer> playerY` = `<Integer>` blockType;
            PRINT INFO "Placed " + `<String> get block name matching
<Integer> craftedItem` + " at your position.";
        ELSE
            PRINT WARNING "You don't have " + `<String> get block name
matching <Integer> craftedItem` + " in your crafted items.";
ELSE
    PRINT WARNING "Invalid block number. Please enter a valid block
number.\n";
    PRINT WARNING `<String> BLOCK_NUMBERS_INFO` + "\n";
Wait on player to press ENTER;

END
```

Flowchart



References

- yEd - Graph Editor we used to make the flowcharts