

Tacita's JavaCraft - Provisional Report (Group 18)

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Group Details

Group Name	Tacita
Group Number	18
TA	TA assigned to Group 18

Students

Student Name	Student ID
Leopold Meinel	i6352276
Anton Haarmann	i6367288
Sian Lodde	i6343174
Tristan Dormans	i6343359

Who Did What

Task	Who worked on the task	Participation in percentages
Creating the initial pseudocode and flowcharts	Leopold Anton Tristan Sian	Even across all participants
Setting up the Gitlab repository	Leopold	100%
Creating the documentation for the JavaCraft code	Leopold Anton Tristan Sian	Even across all participants
Creating the flowchart and pseudocode for the global game	Tristan	100%
Creating FSA for automaton	Leopold Tristan	90% 10%
Creating the table for automaton	Leopold	100%
Converting ODF Flowcharts to .graphml	Tristan	100%
Deciding on the uniform format for the flowcharts	Leopold Anton Tristan Sian	Even across all participants
Deciding on the uniform format for the pseudocode	Leopold Anton Tristan Sian	90% 10%
Converting flowcharts to uniform format	Sian Tristan	85% 15%
Converting pseudocode to uniform format	Leopold	100%

Task	Who worked on the task	Participation in percentages
Updating the documentation	Leopold	100%
Cleaning up the repository folders	Sian	100%
Exporting flowcharts to SVG format	Sian	100%
Implenting two blocks and two crafting items to the game	Anton	100%
Updating the functions involved with new blocks and crafting items	Anton	100%
Creating the provisional report document	Anton	100%
Merging the flowchart images with the report document int one PDF	Sian	100%
Setting repository naming of folders to industry standard	Leopold	100%

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 `` READ user input` == y (caseless check)

Set `` unlockMode` = false;

Set `` craftingCommandEntered` = false;

Set `` miningCommandEntered` = false;

Set `` 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 `` READ user input` == "w" OR "up" OR "s" OR "down" OR "a" OR "left" OR "d" OR "right" (caseless check)

IF `` unlockMode` == true

Set `` movementCommandEntered` = true;

Move player;

ELSE IF `` READ user input` == "m" (caseless check)

IF `` unlockMode` == true

Set `` miningCommandEntered` = true;

Mine block;

ELSE IF `` READ user input` == "p" (caseless check)

PRINT INFO `players inventory`;

PRINT INFO "Enter the block type to place: ";

Place block `` READ user input`;

ELSE IF `` READ user input` == "c" (caseless check)

PRINT INFO `crafting recipes`;

PRINT INFO "Enter the recipe number to craft: ";

Craft item `` READ user input`;

ELSE IF `` READ user input` == "i" (caseless check)

Interact with world;

ELSE IF `` READ user input` == "save" (caseless check)

PRINT INFO "Enter the file name to save the game state: ";

Save game as `` READ user input`;

ELSE IF `` READ user input` == "load" (caseless check)

PRINT INFO "Enter the file name to load the game state: ";

Load game from `` READ user input`;

ELSE IF `` READ user input` == "exit" (caseless check)

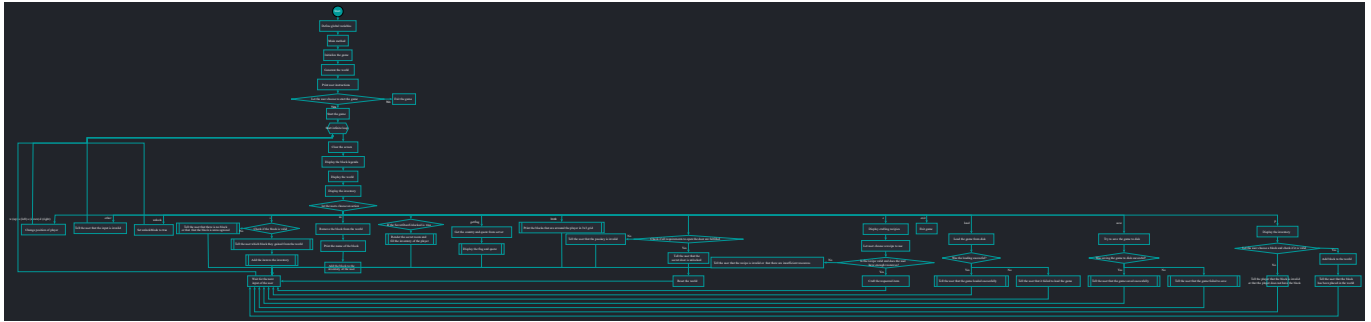
```

        PRINT INFO "Exiting the game. Goodbye!\n";
        Exit game;
    ELSE IF `<String> READ user input` == "look" (caseless check)
        Print all blocks surrounding 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

Documentation of functions

Additional Info

See [Appendix](#) for flowcharts and pseudocodes of 16 functions.

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

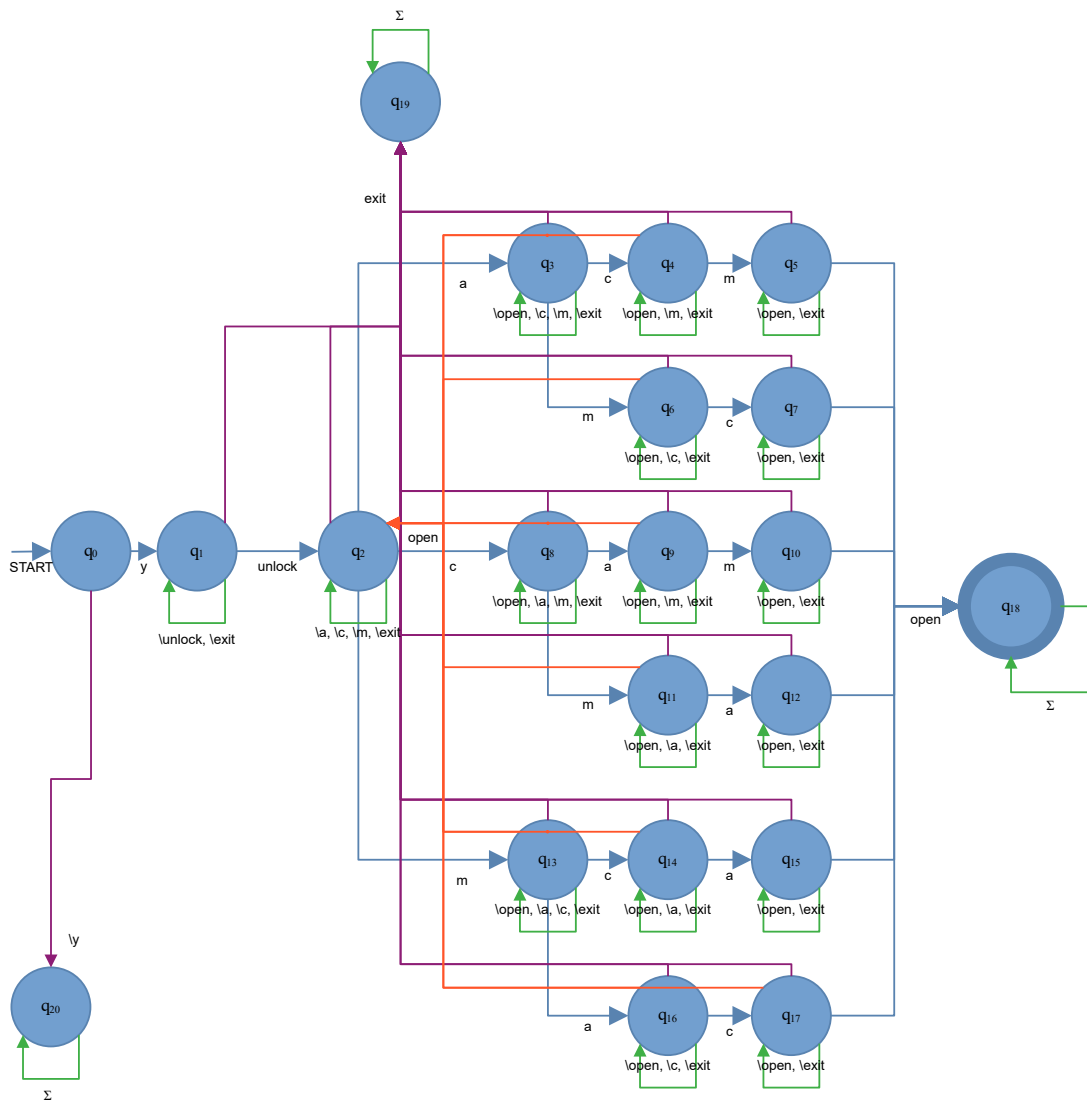
$\Sigma=\{y, \text{unlock}, a, c, m, \text{open}, \text{exit}\}$ (caseless check)

δ : Transition Function

$L(D)=\{y, \text{unlock}, \{\text{mandatory } a, c, m \text{ and optional } y, \text{unlock in any order; repetition is possible}\}, \text{open}\}$

$Q=\{q_0, q_1, q_2, q_3, q_4, q_5, q_6, q_7, q_8, q_9, q_{10}, q_{11}, q_{12}, q_{13}, q_{14}, q_{15}, q_{16}, q_{17}, q_{18}, q_{19}, q_{20}\}$

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



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

Overview

- [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.

Who did what?

- PLACEHOLDER

Appendix

void clearScreen()

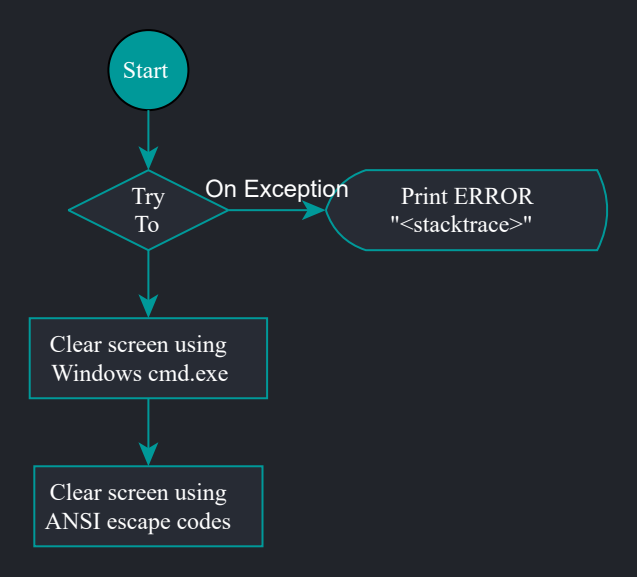
Java

```
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



void craftIronIngot()

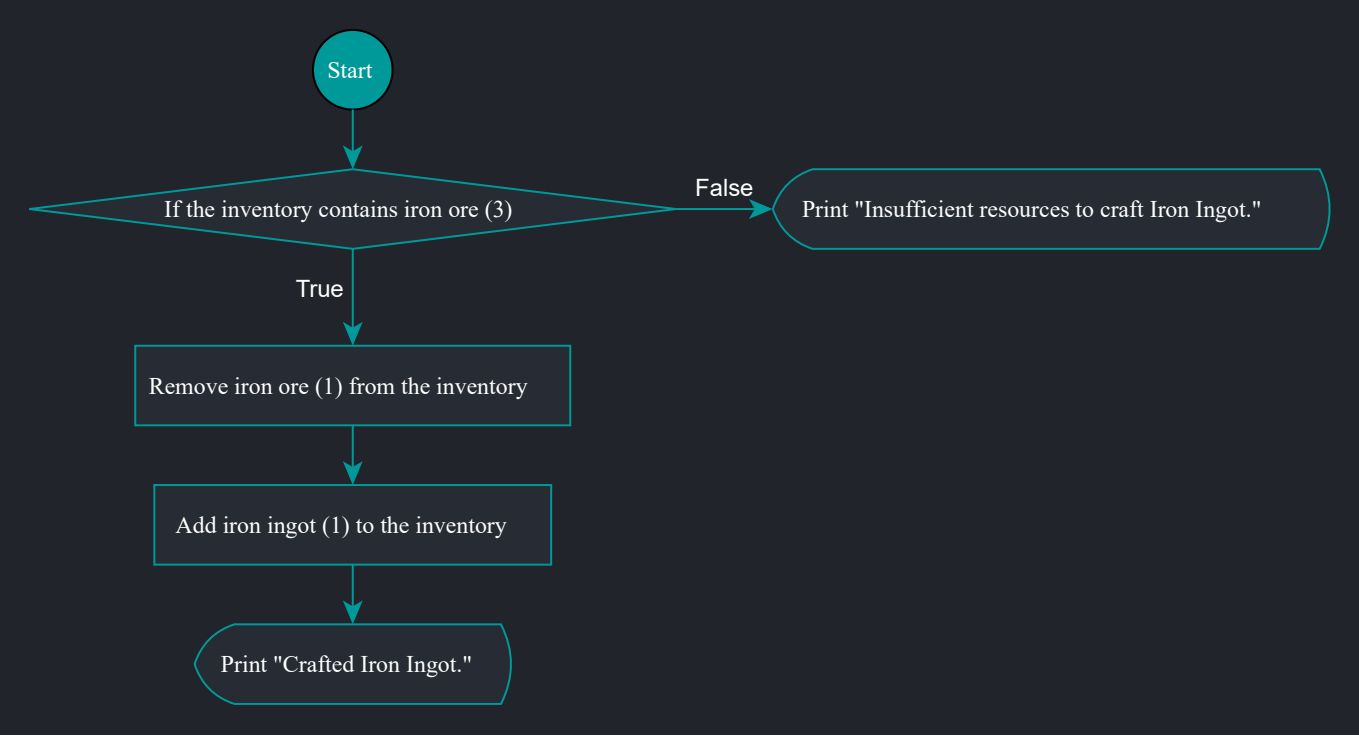
Java

```
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



void craftItem(int recipe)

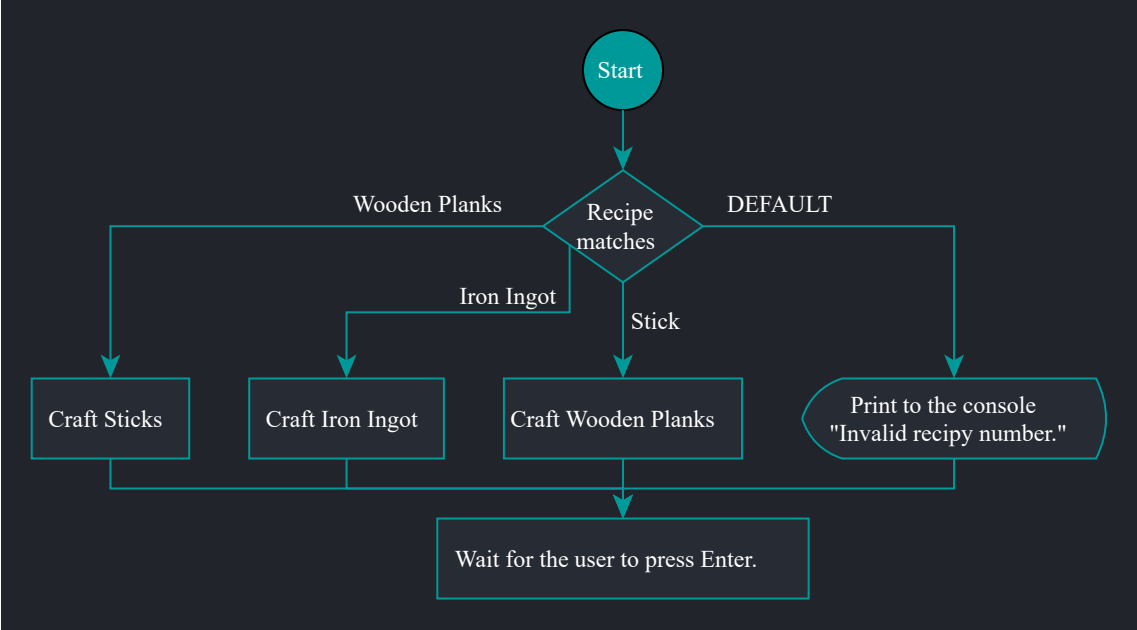
Java

```
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



void craftStick()

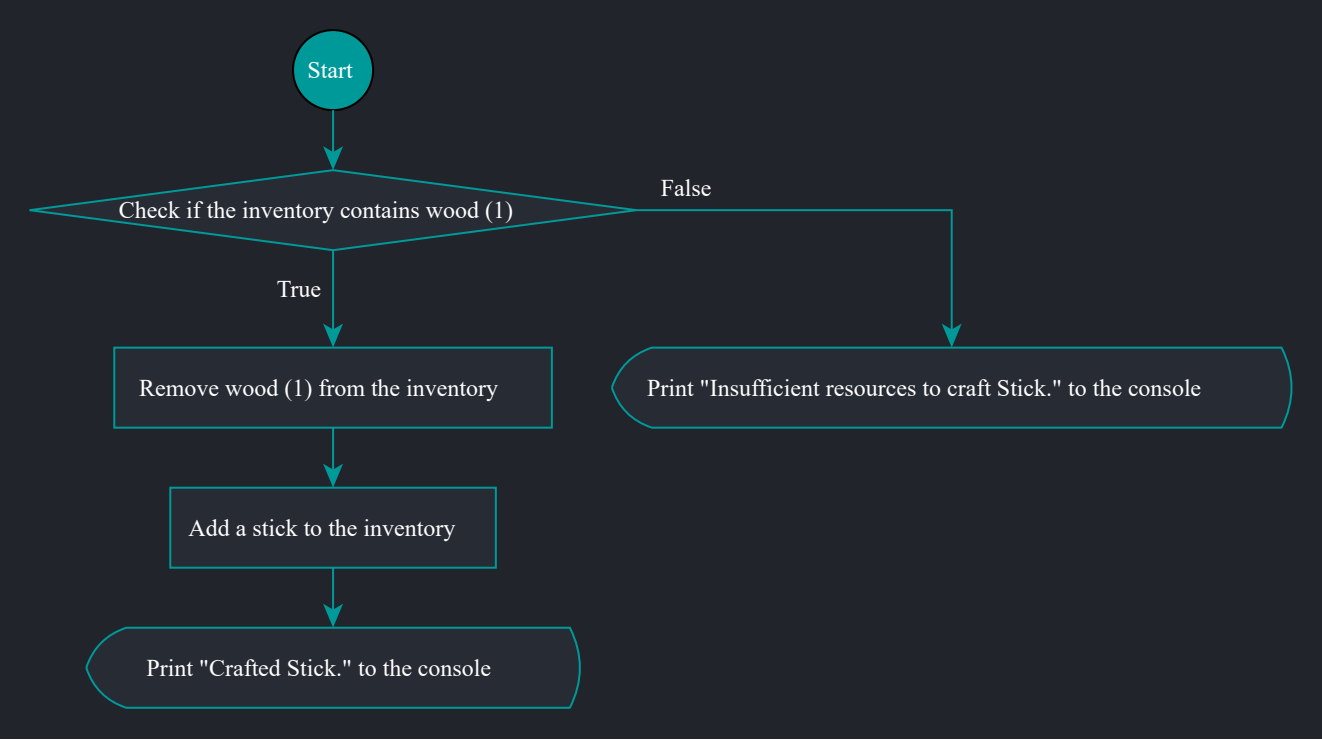
Java

```
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



void craftWoodenPlanks()

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



void displayCraftingRecipes()

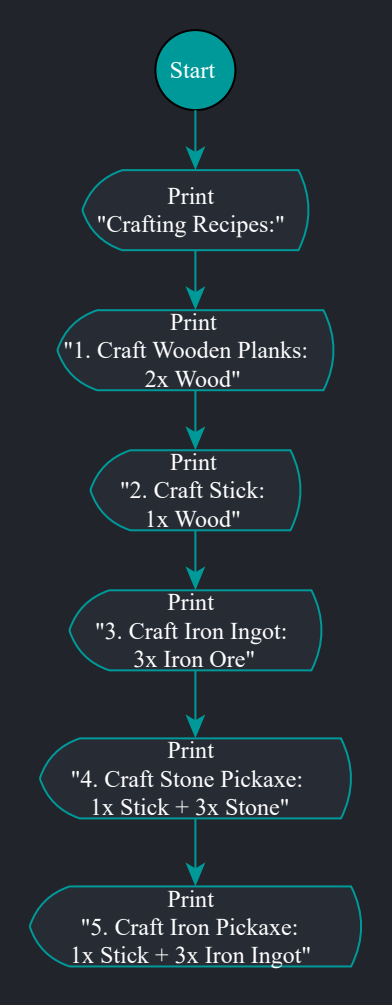
Java

```
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



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();
}
```

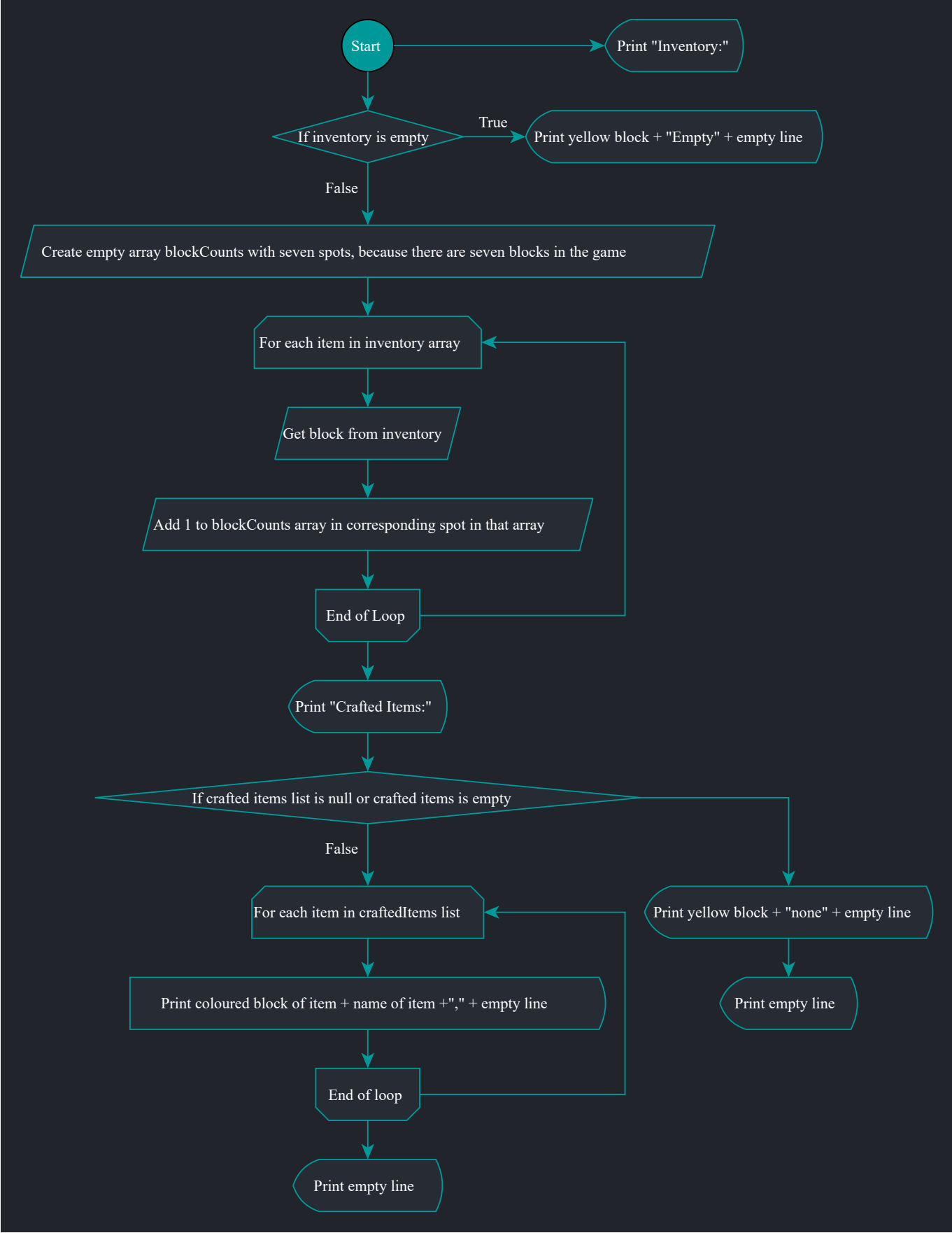
Pseudocode

```
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> occurrences` = `<Integer array> blockCounts @ index
<Integer> blockType`;
        IF `<Integer> occurrences` > 0
            PRINT INFO `<String> get block name matching <Integer> blockType` + "
- " + `<Integer> occurrences\n`;
            Set `<Integer> blockType` += 1;
PRINT INFO "Crafted Items:\n";
IF `<Integer list> craftedItems` is non-existent 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



void fillInventory()

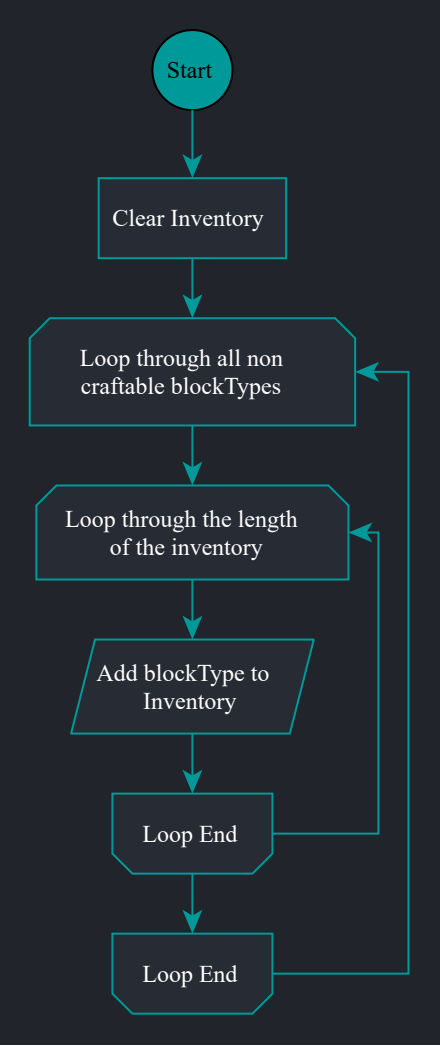
Java

```
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



void generateWorld()

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;
            }
        }
    }
}
```

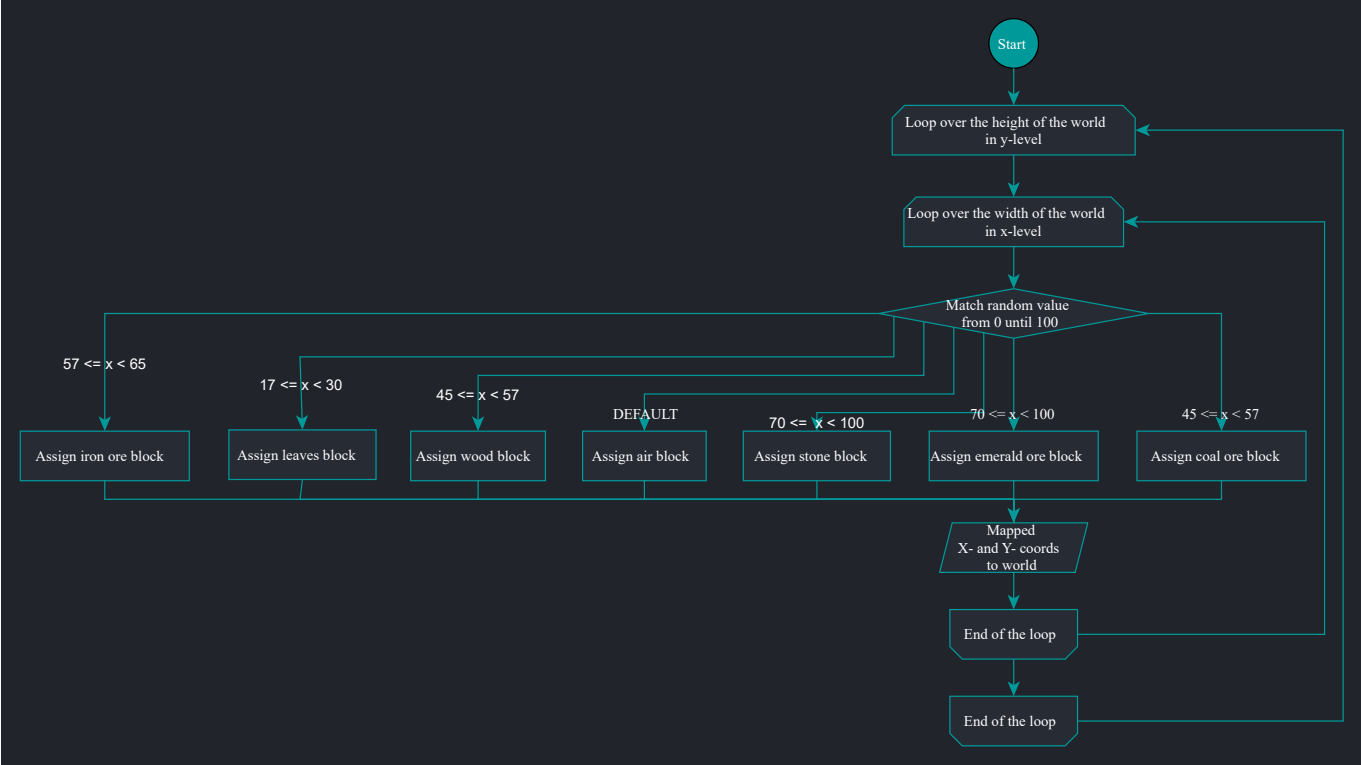
Pseudocode

```
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



char getBlockChar(int blockType)

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 '-';
    }
}
```

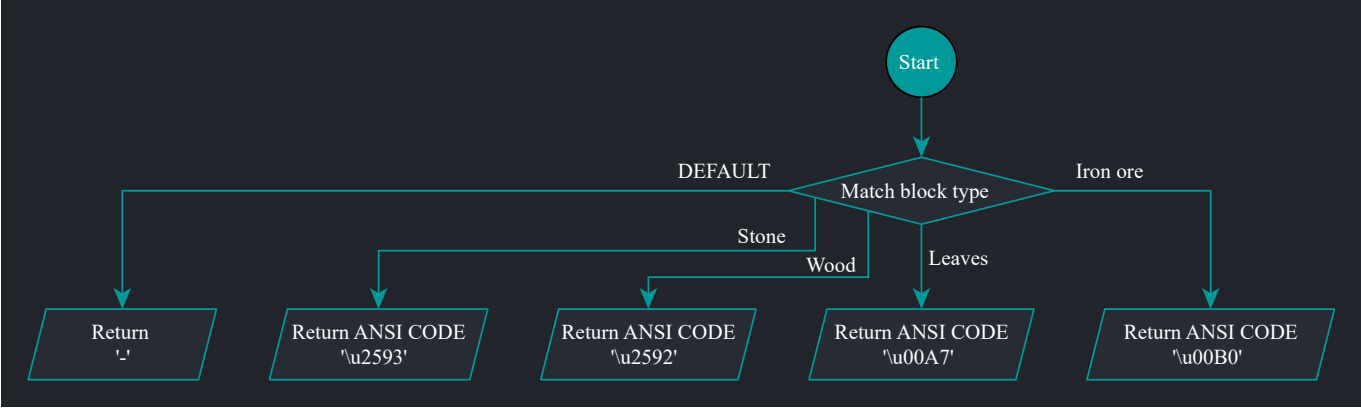
Pseudocode

```
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



String getBlockName(int blockType)

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";  
    }  
}
```

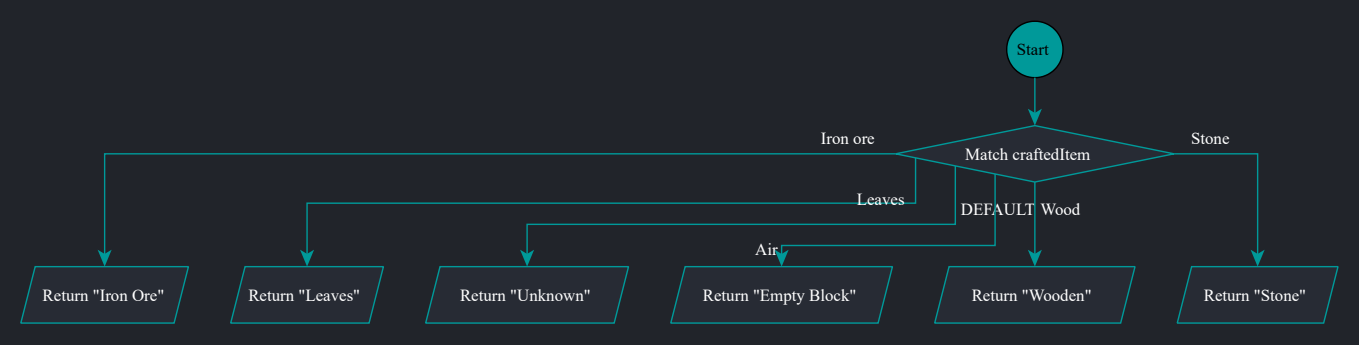

Pseudocode

```
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



String getBlockSymbol(int blockType)

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) + " ";  
}
```

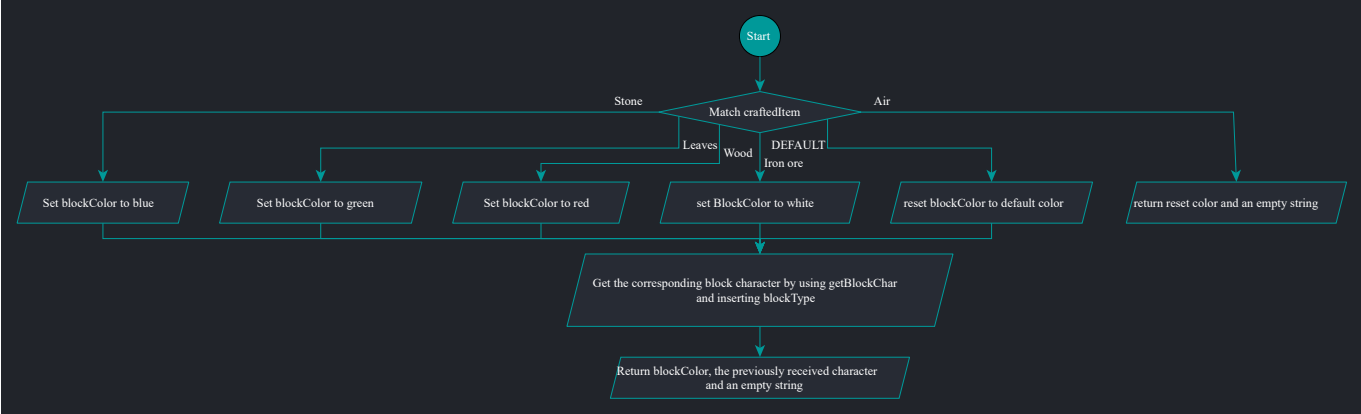
Pseudocode

```
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



String getCraftedItemName(int craftedItem)

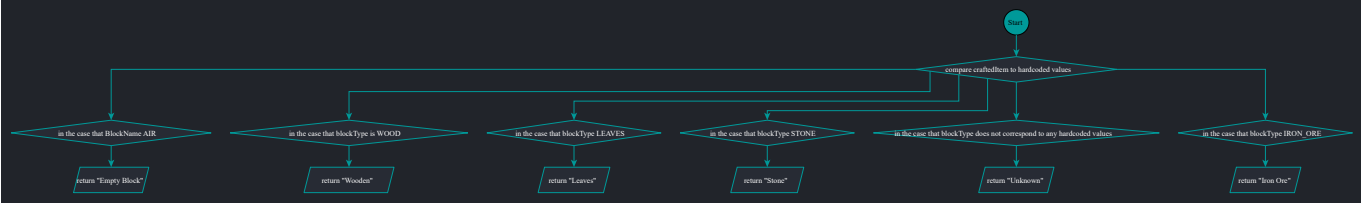
Java

```
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



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();
}
```

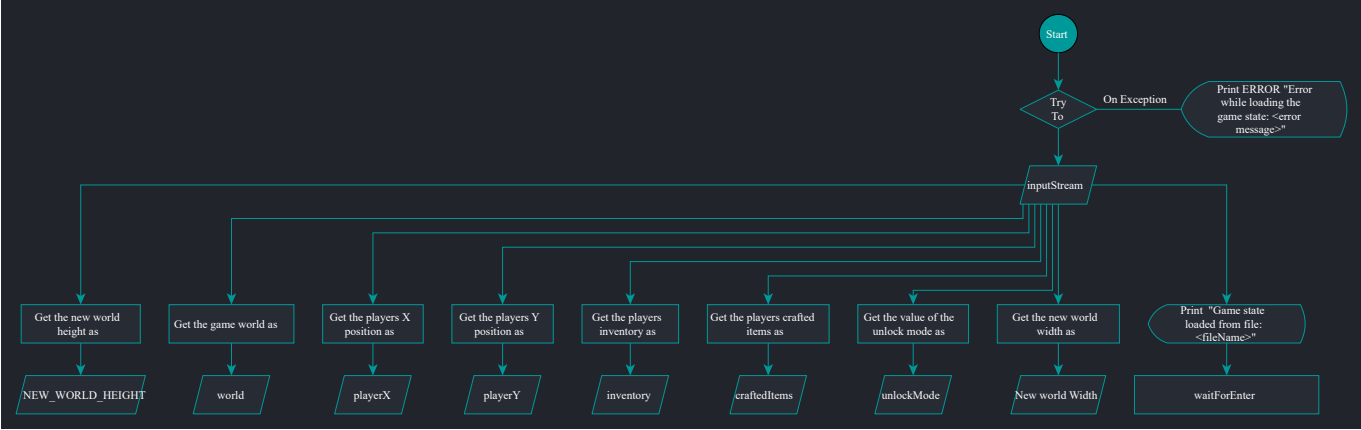

Pseudocode

```
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



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();
}
```

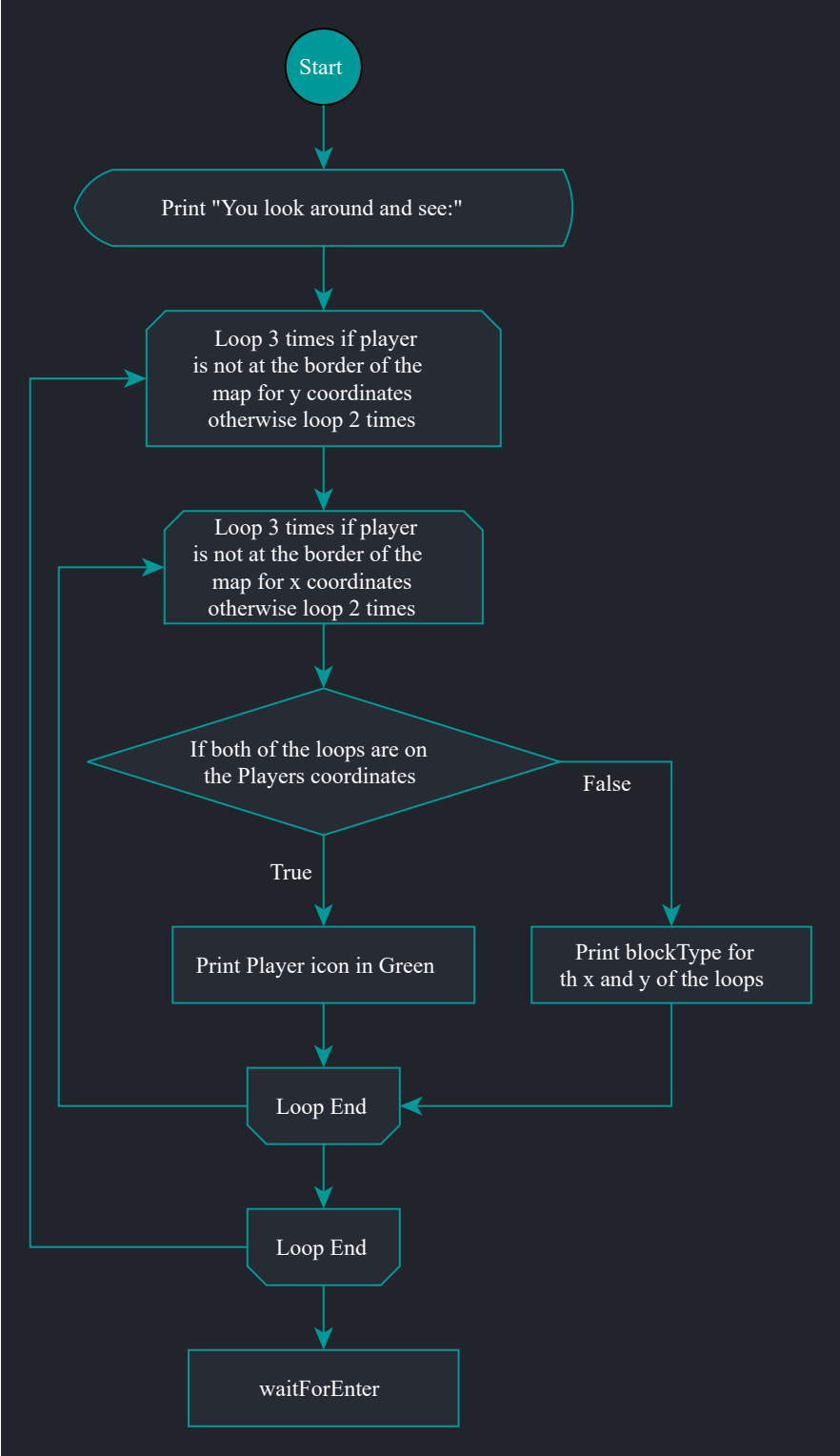
Pseudocode

```
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



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();
}
```

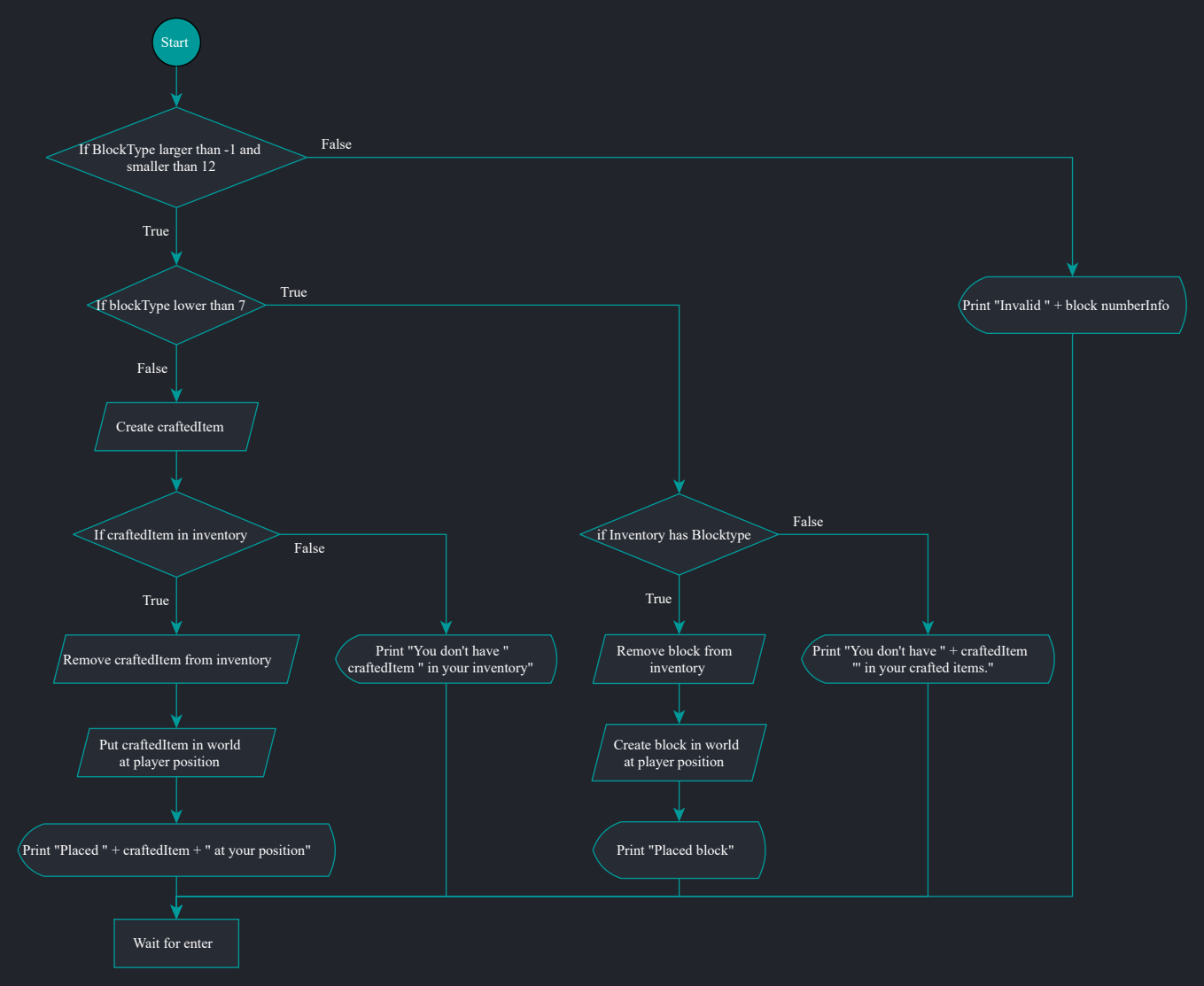
Pseudocode

```
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

- [Template](#) - Canvas task on which this document is based
- [yEd](#) - Graph Editor we used to make the flowcharts