# JavaCraft Provisional Report - Group 75

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## Group Details

### Group

| Attribute | Details |
|---|---|
| Group Name | The Jokers |
| Group Number | 75 |
| TA | Thomas |

### Group Members

| Student Name | Student ID |
|---|---|
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## Introduction - Still to complete

**This provisional report is showing the game logic and workflow of the project “JavaCraft” which is a terminal game written in java that is inspired from the famous game “Minecraft”. (Ethan please write a good description i count on you , i suck at this things (-)__(-) )(i think here we need to write who did who?? maybe)**

## JavaCraft's Workflow

### Flowchart

See *Appendix Figure 1A*

### Pseudocode

See *Appendix Figure 1B*

## Functionality Exploration

| No. | Function Name | Description |
|---|---|---|
| 2. | generateWorld | Iterates over the world matrix and randomly assigns block types to each world block |
| 1. | initGame | Takes in two integers for the world's width and height and defines the initial world and player values |
| 3. | displayWorld | Iterates over the world matrix and prints each block's symbol and player's position |
| 4. | getBlockSymbol | Takes in an integer as input and returns a string representing the colour and character of the corresponding block |
| 5. | getBlockChar | Takes in an integer as input and returns the corresponding character |
| 6. | startGame | |
| 7. | | |
| 8. | | |
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| 28. | | |
| 29. | | |
| 30. | | |
| 31. | | |

| No. | Function Name | Description |
|---|---|---|
| 32. | | |
| 33. | | |
| 34. | | |
| 35 | | |

*For Flowcharts and Pseudocode, see Appendix Figures 2 - 16*

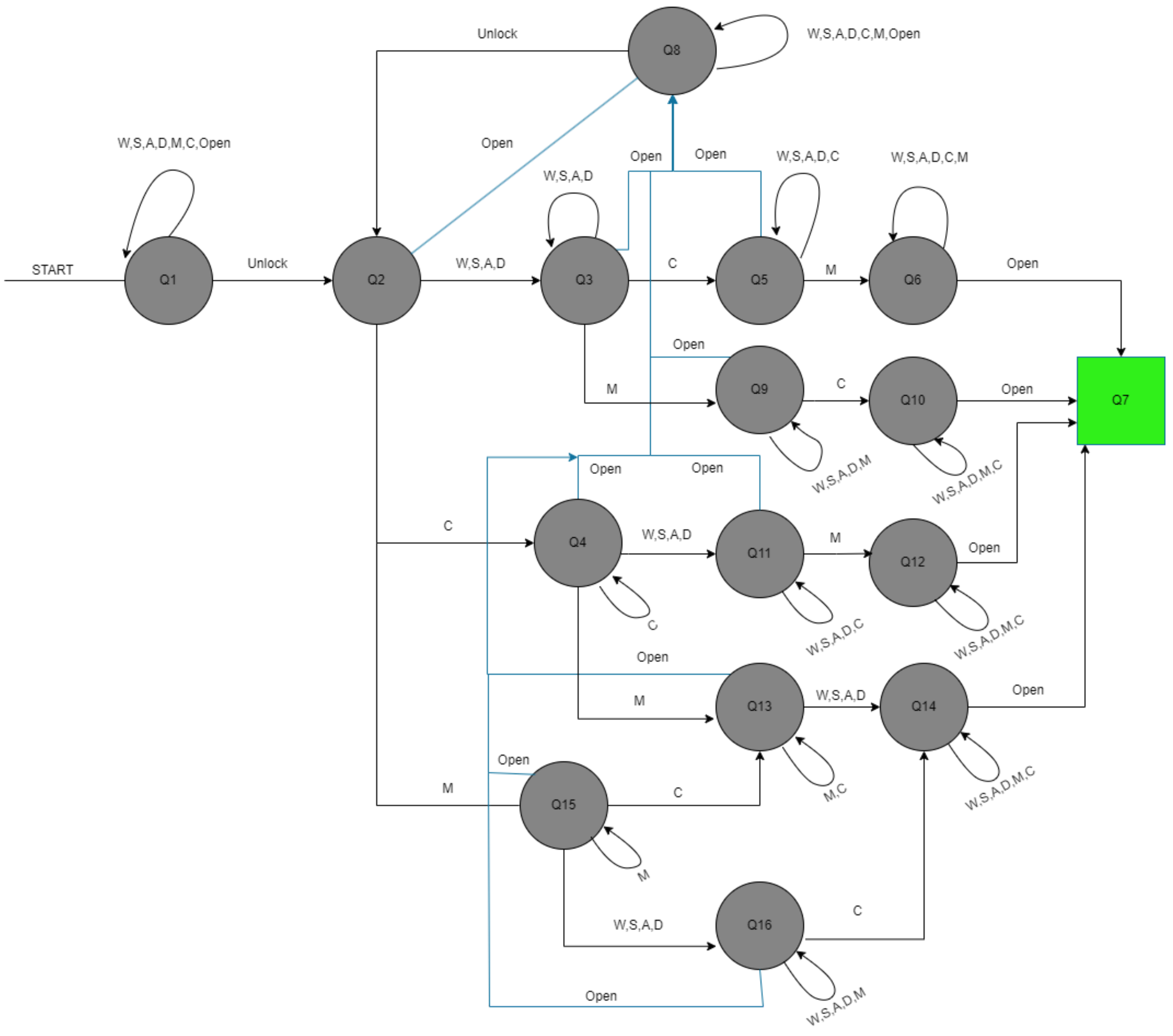
# Finite State Automata (FSA) Design

## Secret Door Logic Analysis

For the player to unlock the secret door he has to enter the 'Unlock Mode' which is activated by the command 'unlock'. While he is in the unlock mode he has to go through different actions ( the order does not matter ): Move, Craft, Mine. After he completes these actions he can type the open command to unlock the secret door, but if he misses one or more actions everything will get back to normal and he will have to enter into the unlock mode again and repeat the process.

## FSA Illustration & Description

Σ = {Unlock, W, A, S, D, C, M, Open}



## Git Collaboration & Version Control - Still to complete

- Repository Link: [Insert Git Link Here]
- Branch Details: List branch names and corresponding members • Changes & Conflicts: Discuss how changes and conflicts were handled.

## Extending the Game Code

## Interacting with Flags API

## Conclusion

## Appendix

## Figure 1: GameFlow

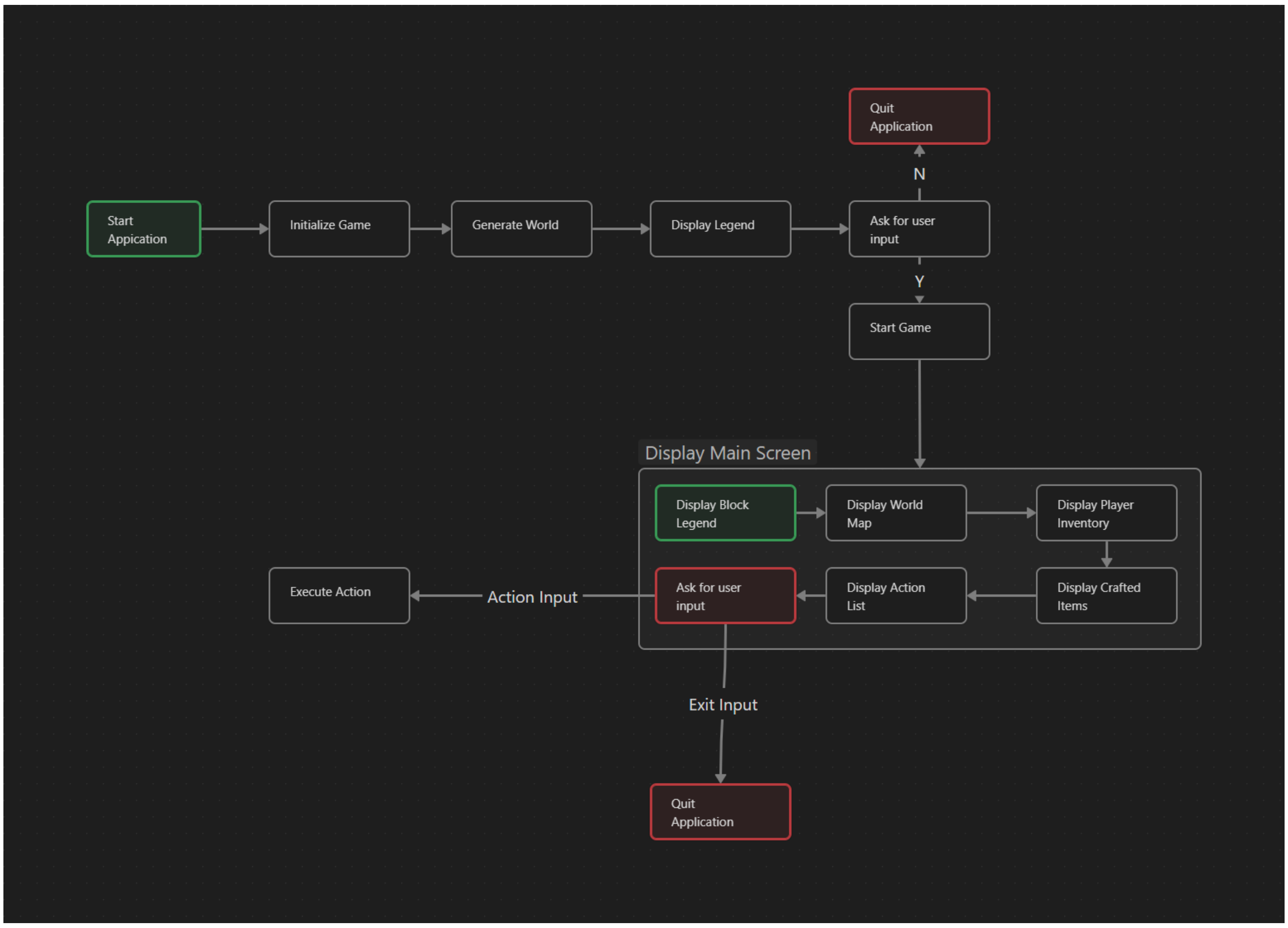


*Figure 1A*

```
Start

Initialize Game
Generate the World
Print Game Instructions

Start Game
    WHILE True DO
        Print Block Legend
        Print World Map
        Print Inventory
        Print Crafted Items
        Print Action List
```

```
Player Enters Action
SWITCH Player Action
    CASE “W”, “A”, “S”, “D”:
        Move Player Character in the Specified Direction
    CASE “M”:
        IF Block Exists THEN
            Print “Mined {blockName}”
        ELSE
            Print “No block to mine here”
    CASE “P”:
        Input blockType
        IF blockType is Valid THEN
            IF blockType is in Inventory or Crafted Items THEN
                Print “Placed {blockName}”
            ELSE
                Print “You don’t have {blockType} in your inventory”
        ELSE
            Print “Invalid Block Type”
    CASE “C”:
        Display Craft Recipes
        Input Recipe Number
        IF Recipe Number is Valid THEN
            IF Player has Recipe Blocks THEN
                Craft Item
            ELSE
                Print “Not enough blocks”
        ELSE
            Print “Invalid recipeNum”
    CASE “I”:
        Check Block Type at Player’s Coordinates
        SWITCH Block Type
            CASE Wood:
                Add Wood to Inventory
            CASE Leaves:
                Add Leaves to Inventory
            CASE Stone:
                Add Stone to Inventory
            CASE Iron Ore:
                Add Iron Ore to Inventory
            CASE Air:
                Do nothing
    CASE “Save”:
        Save Current World State
    CASE “Load”:
        Ask for File Name
        TRY
            Load Saved File
            Print “Game state loaded from {fileName}”
        CATCH Exception
            Print “Error while loading the game state”
    CASE “Exit”:
        Print “Exiting the game. Goodbye!”
        Exit Game
        END SWITCH
    END WHILE

End
```

*Figure 1B*

## Figure 2: InitGame

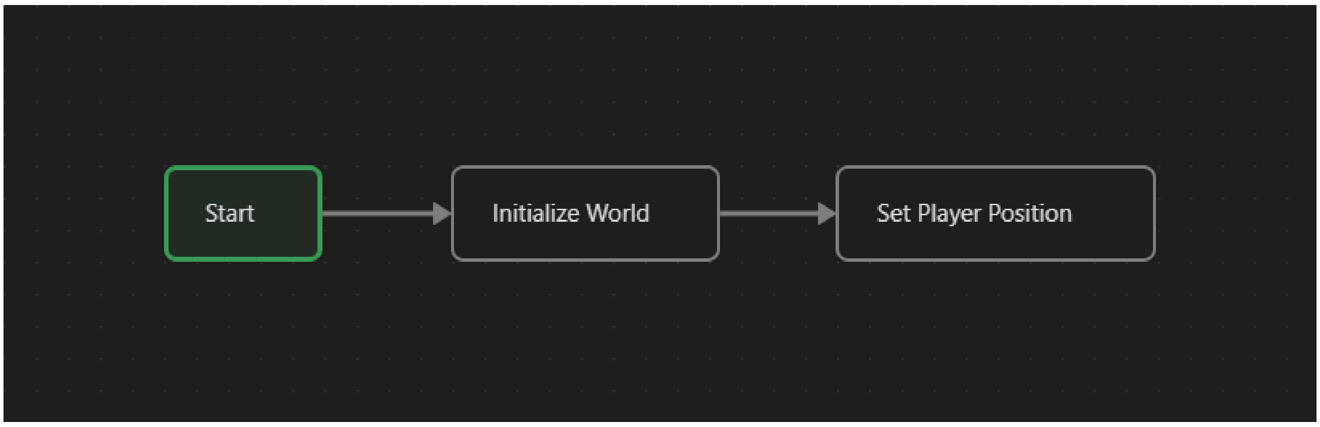


*Figure 2A*

```
Algorithm InitGame(int Width, int Height)
        World = [Width][Height]
        PlayerXCoordinate = Width / 2
        PlayerYCoordinate = Height / 2
END
```

*Figure 2B*

## Figure 3: GenerateWorld

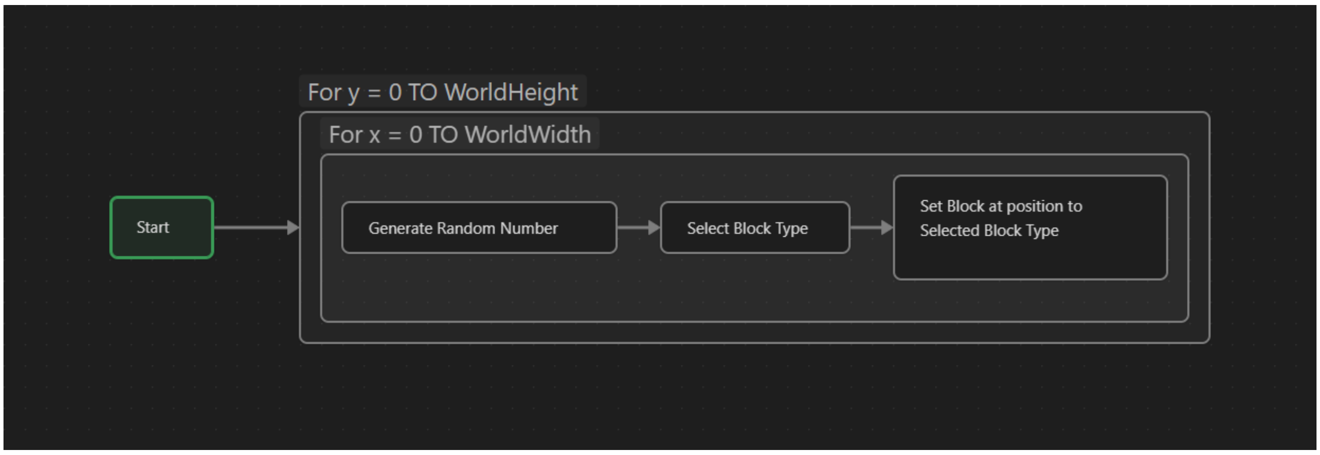


*Figure 3A*

```
Algorithm GenerateWorld(int WorldHeight,int WorldWidth)
        FOR Y = 0 TO WorldHeight-1
                FOR X = 0 TO WorldWidth-1
                        Random = Random number between 0 and 100
                        IF Random < 20 THEN
```

```
                                World[X][Y] = WOOD
                        ELSE IF Random < 35 THEN
                                World[X][Y] = LEAVES
                        ELSE IF Random < 50 THEN
                                World[X][Y] = STONE
                        ELSE IF Random < 70 THEN
                                World[X][Y] = IRON_ORE
                        ELSE
                                World[X][Y] = AIR
END
```

*Figure 3B*

## Figure 4: GetBlockSymbol

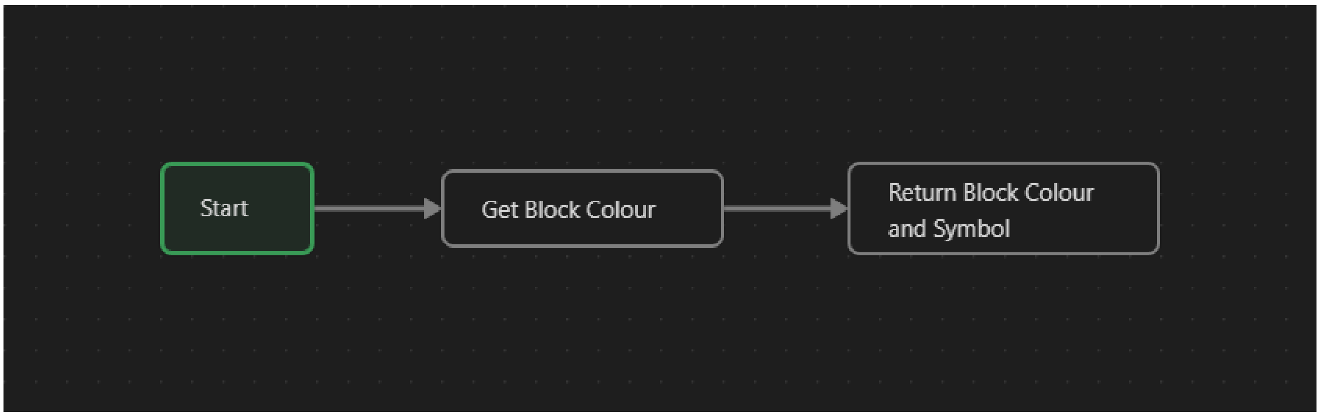


*Figure 4A*

```
Algorithm GetBlockSymbol(int BlockType)
        BlockColor = “”
        SWITCH BlockType
                CASE AIR:
                        return “-”
                CASE WOOD:
                        BlockColor = RED
                CASE LEAVES:
                        BlockColor = GREEN
                CASE STONE:
                        BlockColor = BLUE
                CASE IRON ORE:
                        BlockColor = WHITE

                RETURN "BlockColor Block Character “
END
```

*Figure 4B*

## Figure 5: DisplayLegend

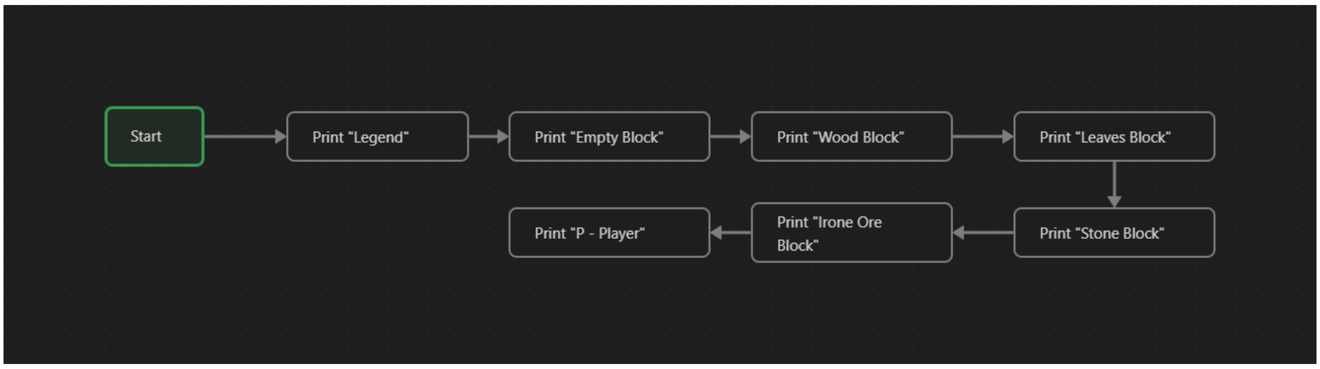


*Figure 5A*

```
Algorithm DisplayLegend()
        Print ”Legend:”
        Print ”-- - Empty block”
        Print ”WOOD BLOCK”
        Print ”LEAVES BLOCK”
        Print ”STONE BLOCK”
        Print ”IRON ORE”
        Print ”P - Player”
END
```

*Figure 5B*

## Figure 6: DisplayWorld

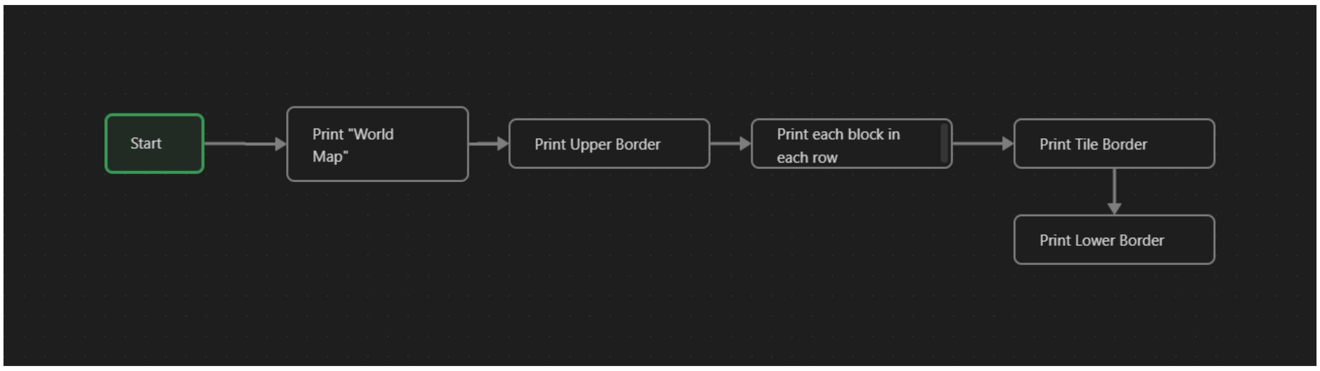


*Figure 6A*

```
Algorithm DisplayWorld(boolean InSecretArea)
        Print ”World Map”
        Print ”GAME BORDER”

        FOR Y = 0 TO WorldHeight
                Print(”║”)
                FOR x TO  WorldHeight
                        IF x = playerX AND y = playerY AND NOT InSecretArea THEN
                                Print ”P”
                        ELSE IF x = playerX AND y = playerY AND InSecretArea THEN
                                Print ”P”
                        ELSE
                                GetBlockSymbol of World[X][Y]
                                Print ”║”
                                Print "╚═" + "=" repeat(worldWidth * 2 - 2) + "╝"
END
```

*Figure 6B*

## Figure 7: GenerateEmptyWorld

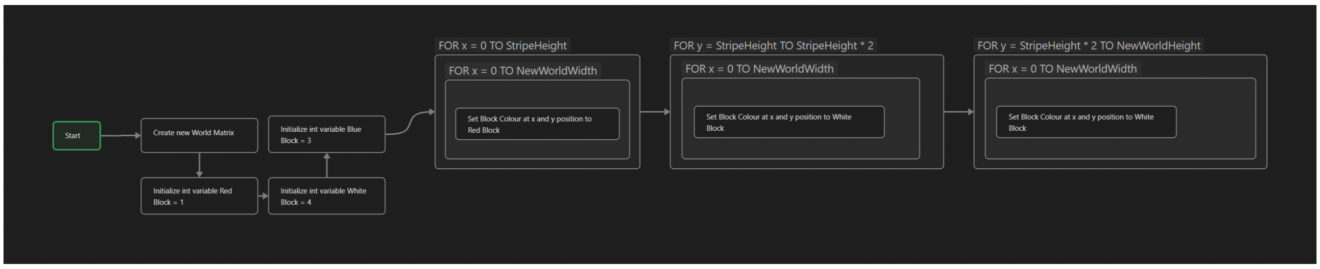

Start
Create new World Matrix
Initialize int variable Red Block = 1
Initialize int variable White Block = 4
Initialize int variable Blue Block = 3
FOR x = 0 TO StripeHeight
FOR x = 0 TO NewWorldWidth
Set Block Colour at x and y position to Red Block
FOR y = StripeHeight TO StripeHeight * 2
FOR x = 0 TO NewWorldWidth
Set Block Colour at x and y position to White Block
FOR y = StripeHeight * 2 TO NewWorldHeight
FOR x = 0 TO NewWorldWidth
Set Block Colour at x and y position to White Block

*Figure 7A*

```
Algorithm GenerateEmptyWorld(int WorldWidth, int WorldHeight)
        World = [WorldWith][WorldHeight]
        RedBlock = 1
        WhiteBlock = 4
        BlueBlock = 3

        StripeHeight = WorldHeight/3

        FOR y = 0 TO StripeHeight
                FOR x = 0 TO WorldWidth
                        World[x][y] = RedBlock
                End FOR
        End FOR

        FOR y = StripeHeight TO StripeHeight*2
                FOR x = 0 TO WorldWidth
                        World[x][y] = RedBlock
                End FOR
        End FOR

        FOR y = StripeHeight*2 TO WorldHeight
                FOR x = 0 TO WorldWidth
                        World[x][y] = RedBlock
                End FOR
        End FOR
END
```

*Figure 7B*

## Figure 8: ClearScreen

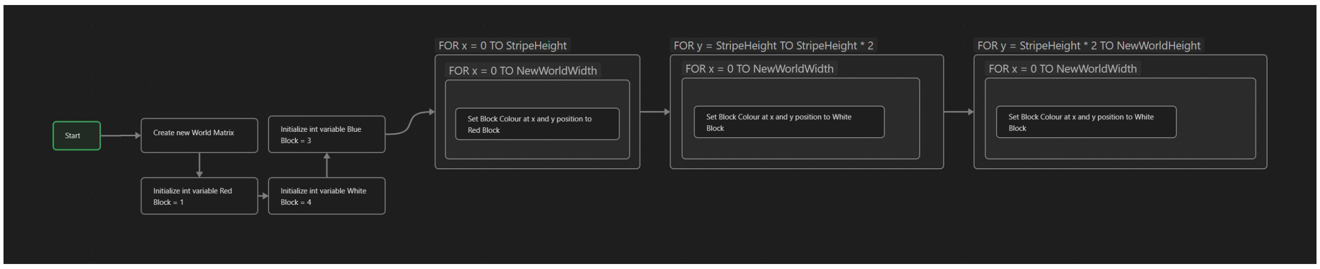

Start
Create new World Matrix
Initialize int variable Red Block = 1
Initialize int variable White Block = 4
Initialize int variable Blue Block = 3
FOR x = 0 TO StripeHeight
FOR x = 0 TO NewWorldWidth
Set Block Colour at x and y position to Red Block
FOR y = StripeHeight TO StripeHeight * 2
FOR x = 0 TO NewWorldWidth
Set Block Colour at x and y position to White Block
FOR y = StripeHeight * 2 TO NewWorldHeight
FOR x = 0 TO NewWorldWidth
Set Block Colour at x and y position to White Block

*Figure 8A*

```
Algorithm ClearScreen(boolean DebugState)
        IF NOT DebugState THEN
                TRY
                        IF Operating System is "Windows" THEN
                                Execute Command "cmd /c cls"
                        ELSE
                                Print Symbol
                                Flush System Output
                        CATCH IOException or InteruptedException
                                Print Stack Trace
                END TRY
        END IF
END
```

*Figure 8B*

## Figure 9: LookAround

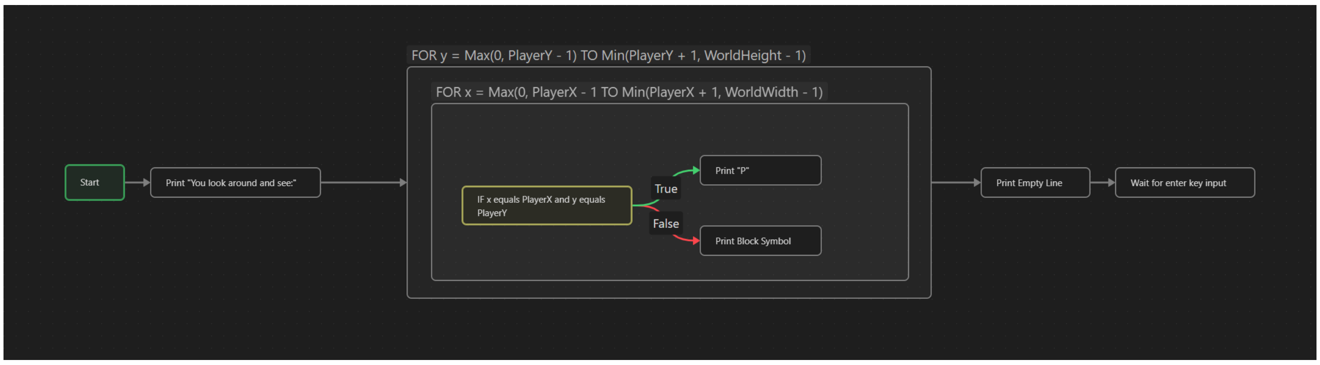

Start
Print "You look around and see:"
FOR y = Max(0, PlayerY - 1) TO Min(PlayerY + 1, WorldHeight - 1)
FOR x = Max(0, PlayerX - 1 TO Min(PlayerX + 1, WorldWidth - 1)
IF x equals PlayerX and y equals PlayerY
True
False
Print "P"
Print Block Symbol
Print Empty Line
Wait for enter key input

*Figure 9A*

```
Algorithm LookAround(int PlayerX, int PlayerY, int WorldWidth, int WorldHeight)
        Print "You look around and see:"
        FOR y = Max(0, PlayerY - 1) TO Min(PlayerY + 1, WorldHeight - 1)
                FOR x = Max(0, PlayerX - 1 TO Min(PlayerX + 1, WorldWidth - 1)
                        IF x == PlayerX AND y == PlayerY THEN
                                Print "P"
                        ELSE
                                Print Block Symbol
                        Print Empty Line
                END FOR
        END FOR
        Print Empty Line
        Wait For Enter Key Input
END
```

*Figure 9B*

## Figure 10: MovePlayer

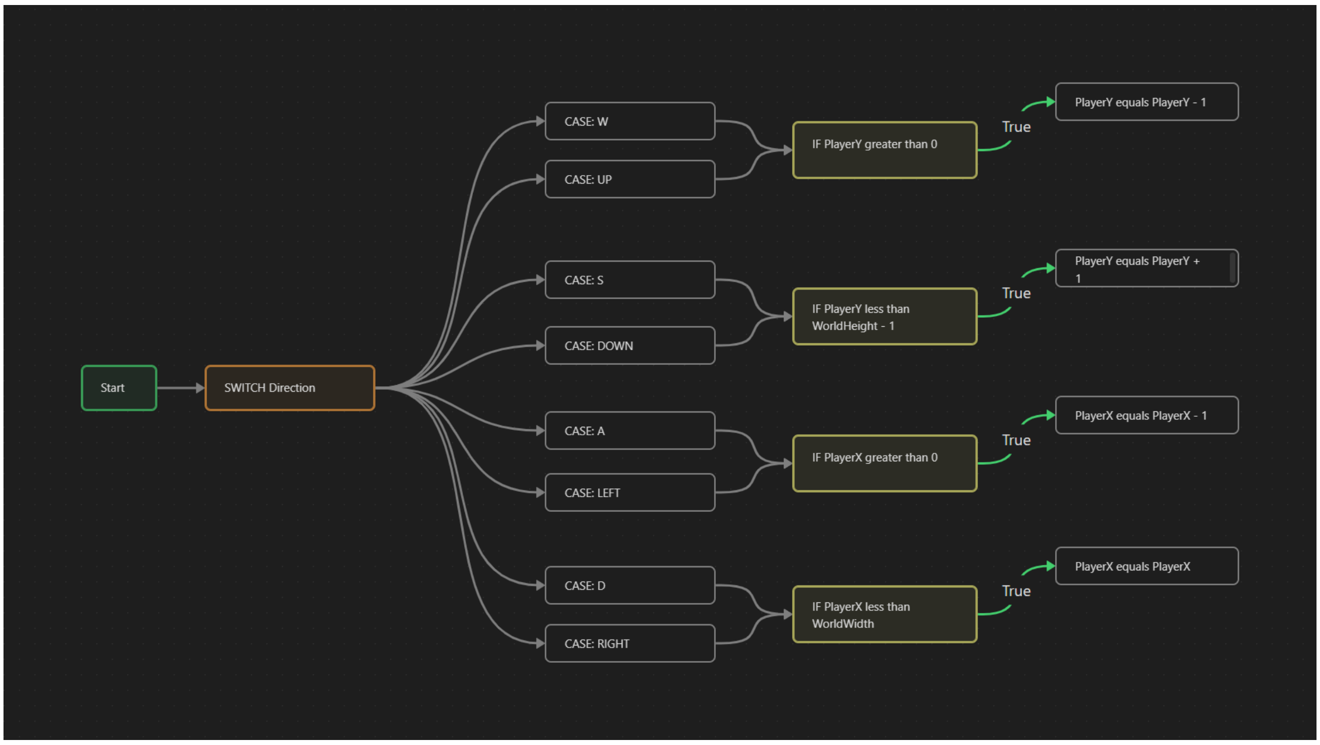

Start
SWITCH Direction
CASE: W
CASE: UP
CASE: S
CASE: DOWN
CASE: A
CASE: LEFT
CASE: D
CASE: RIGHT
IF PlayerY greater than 0
IF PlayerY less than WorldHeight - 1
IF PlayerX greater than 0
IF PlayerX less than WorldWidth
True
True
True
True
PlayerY equals PlayerY - 1
PlayerY equals PlayerY + 1
PlayerX equals PlayerX - 1
PlayerX equals PlayerX

*Figure 10A*

```
Algorithm MovePlayer(string Direction, int PlayerX, int PlayerY, int WorldWidth, int
WorldHeight)
        SWITCH Direction
                CASE: W
                CASE: UP
                        IF PlayerY > 0 THEN
                                PlayerY = PlayerY -1
                        BREAK
                CASE: S
                CASE: DOWN
                        IF PlayerY < WorldHeight - 1 THEN
                                PlayerY = PlayerY + 1
                        BREAK
                CASE: A
                CASE: LEFT
                        IF PlayerX > 0
                                PlayerX = PlayerX - 1
                        BREAK
                CASE: D
                CASE: RIGHT
                        IF PlayerX < WorldWidth
                                PlayerX = PlayerX + 1
                        BREAK
        END SWITCH
END
```

*Figure 10B*

## Figure 11: MineBlock

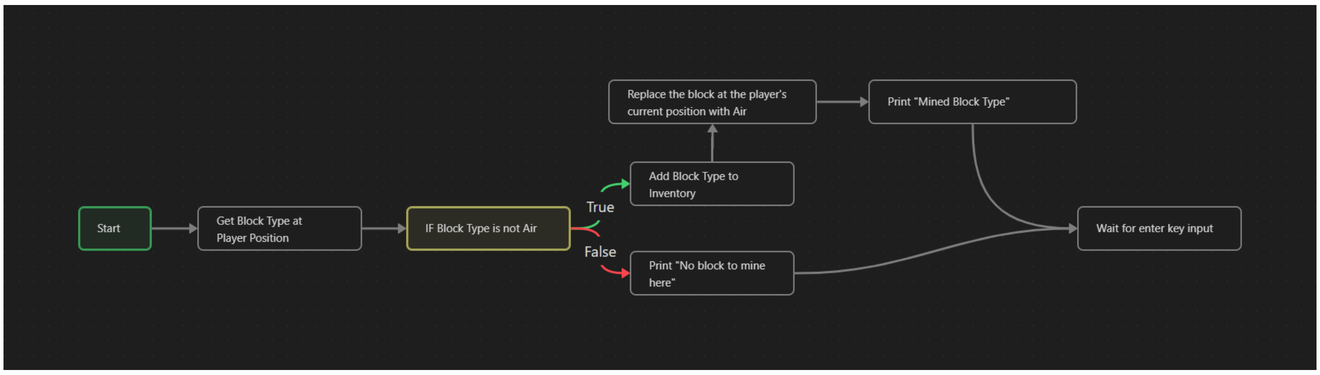

Start
Get Block Type at Player Position
IF Block Type is not Air
True
False
Add Block Type to Inventory
Replace the block at the player's current position with Air
Print "Mined Block Type"
Print "No block to mine here"
Wait for enter key input

*Figure 11A*

```
Algorithm MineBlock(int[][] World, int PlayerX, int PlayerY)
        BlockType = World[PlayerX][PlayerY]
        IF BlockType IS NOT Air THEN
                Add BlockType to Inventory
                World[PlayerX][PlayerY] = Air
                Print "Mined BlockType"
        ELSE
                Print "No block to mine here"
        Wait For Enter Key Input
END
```

*Figure 11B*

## Figure 12: GetBlockTypeFromCraftedItem

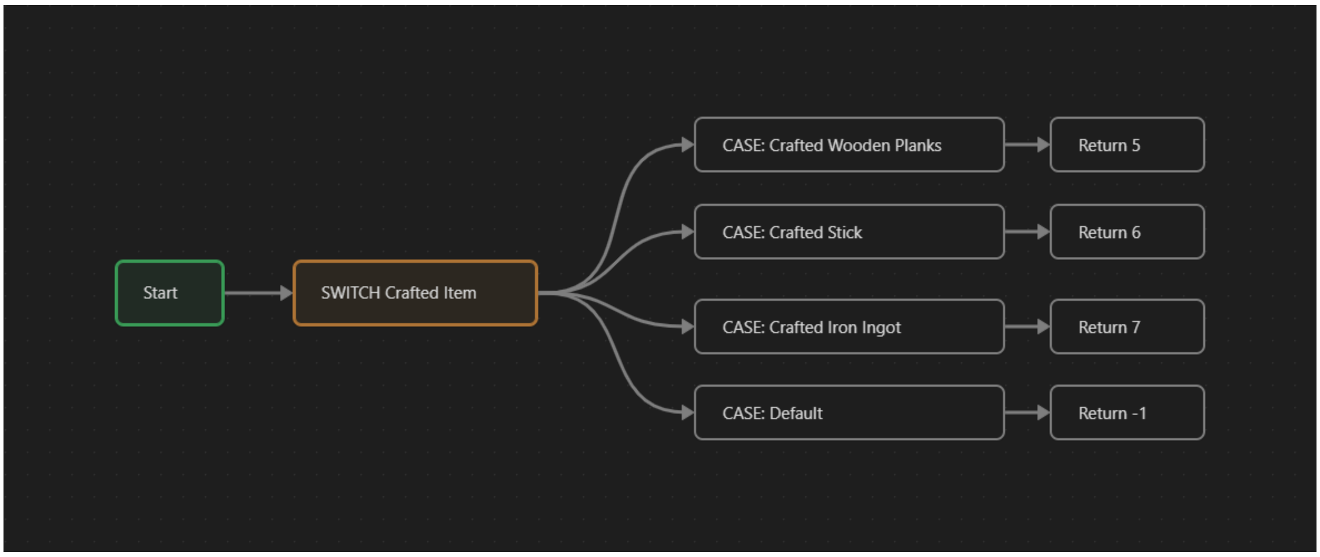


*Figure 12A*

```
Algorithm GetBlockTypeFromCraftedItem(int CraftedItem)
        SWITCH Crafted Item
                CASE Crafted Wooden Planks:
                        Return 5
                CASE Crafted Stick:
                        Return 6
                CASE Crafted Iron Ingot:
                        Return 7
                DEFAULT:
                        Return  -1
END
```

*Figure 12B*

## Figure 13: GetCraftedItemFromBlockType

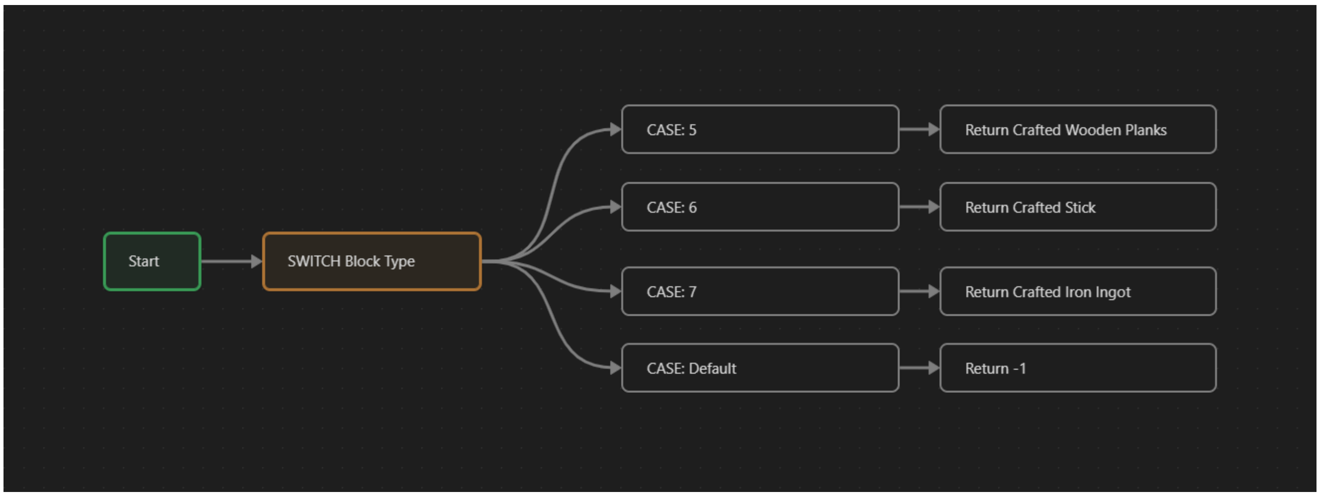


*Figure 13A*

```
Algorithm GetCraftedItemFromBlockType(int BlockType)
        SWITCH BlockType
                CASE 5:
                        Return Crafted Wooden Planks
                CASE 6:
                        Return Crafted Stick
                CASE 7:
                        Return Crafted Iron Ingot
                DEFAULT:
                Return -1
END
```

*Figure 13B*

## Figure 14: DisplayCraftedRecipes

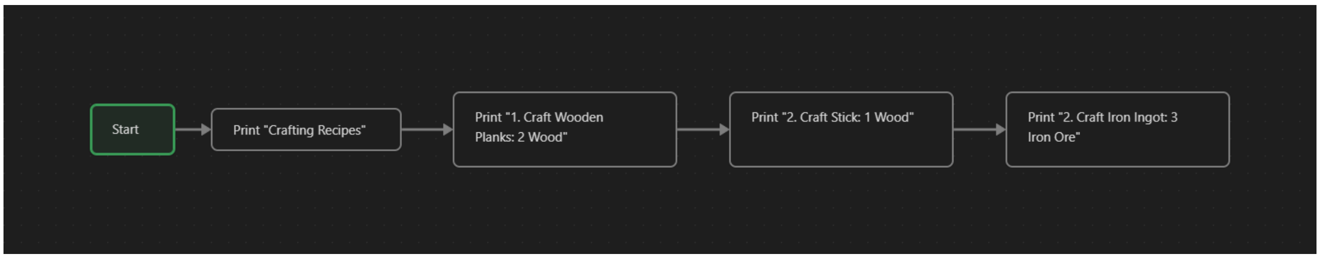

Start
Print "Crafting Recipes"
Print "1. Craft Wooden Planks: 2 Wood"
Print "2. Craft Stick: 1 Wood"
Print "2. Craft Iron Ingot: 3 Iron Ore"

*Figure 14A*

```
Algorithm DisplayCraftRecipes()
        Print “Crafting Recipes”
        Print “1. Craft Wooden Planks: 2 Wood”
        Print “2. Craft Stick: 1 Wood”
        Print “3. Craft Iron Ingot: 3 Iron Ore”
END
```

Figure 14B

## Figure 15: CraftItem

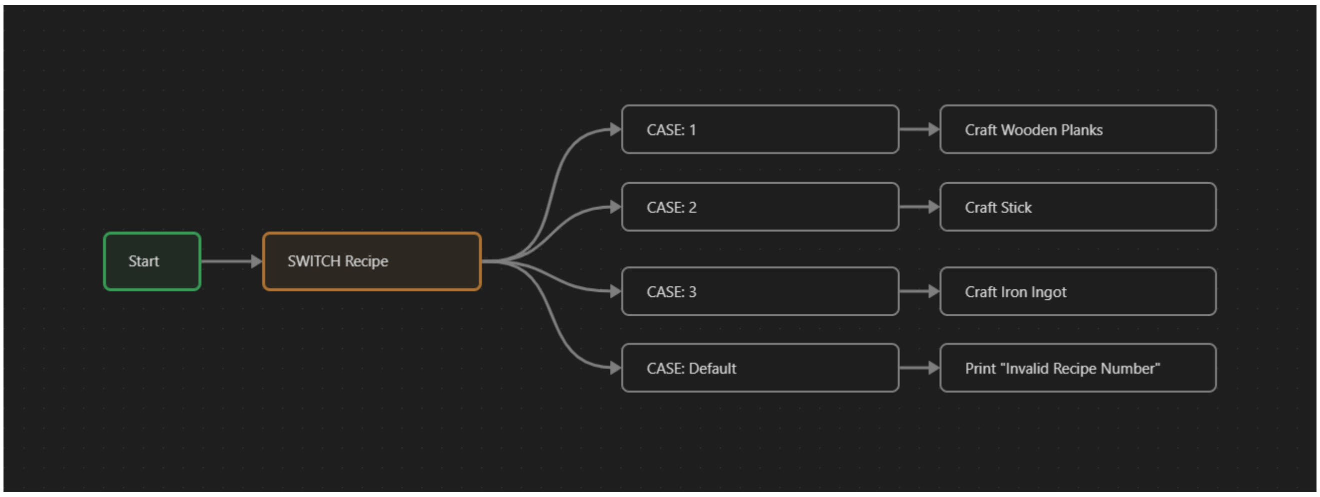


*Figure 15A*

```
Algorithm CraftItem(int Recipe)
        Switch (Recipe)
                CASE 1:
                        Craft Wooden Planks
                CASE 2:
                        Craft Stick
                CASE 3:
                        Craft Iron Ingot
                DEFAULT:
                Print “Invalid recipe number.”
END
```

*Figure 15B*

## Figure 16: CraftWoodenPlanks

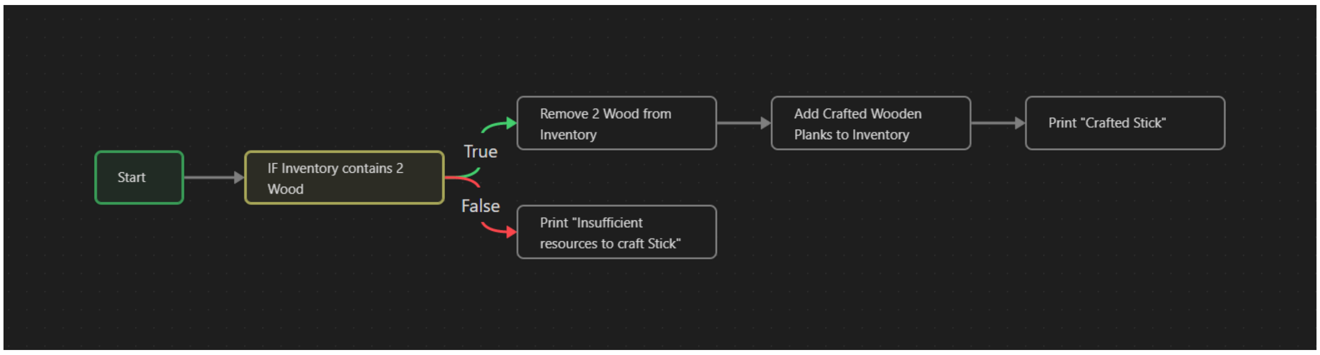

Start
IF Inventory contains 2 Wood
True
False
Remove 2 Wood from Inventory
Add Crafted Wooden Planks to Inventory
Print "Crafted Stick"
Print "Insufficient resources to craft Stick"

*Figure 16A*

```
Algorithm CraftWoodenPlanks
        IF Inventory contains 2 Wood THEN
                Remove 2 Wood from Inventory
                Add Crafted Wooden Planks to Inventory
                Print “Crafted Stick”
        ELSE
                Print “Insufficient resources to craft Stick”
END
```

*Figure 16B*

## References