

For this assignment I used chat gpt to solve the question of converting binary number to decimal numbers, basically first I sent a screen shot of the question to the LLM and then i asked it to solve my specific case and it gave me the following answer:

Here's how you can approach it:

## 0.2 Implementation: Binary to Decimal Conversion

The task is to implement a method that takes an integer array representing a binary number and converts it to its decimal equivalent.

You can use this Java code as a reference:

```
java Copy code

package at.aau.se1;

public class IntroductionExercise {

    // Method to convert a binary number to its decimal equivalent
    public static int binary2decimal(int[] binary) throws IllegalArgumentException {
        int decimal = 0;

        // Iterate over the binary array
        for (int i = 0; i < binary.length; i++) {
            // Validate if the binary array contains only 0s and 1s
            if (binary[i] != 0 && binary[i] != 1) {
                throw new IllegalArgumentException("Array must contain only binary digits");
            }
            // Calculate the decimal equivalent using the binary formula
            decimal += binary[i] * Math.pow(2, (binary.length - 1 - i));
        }

        return decimal;
    }

    // For testing purposes
    public static void main(String[] args) {
        int[] binary = {1, 1, 1, 0}; // Binary number 1110 (14 in decimal)

        int result = binary2decimal(binary);
        System.out.println("The decimal equivalent is: " + result); // Output should be 14
    }
}
```

### Explanation:

- The `binary2decimal` method takes an integer array representing the binary number.
- It checks whether the input array contains only 0s and 1s (valid binary digits).
- The method uses the formula for binary to decimal conversion:

$$\text{Decimal} = \sum_{i=0}^n \text{Binary}[i] \times 2^{n-i}$$

where  $n$  is the length of the binary array.

### Example:

For the binary number `[1, 1, 1, 0]`, the decimal conversion is:

$$(1 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (0 \times 2^0) = 8 + 4 + 2 + 0 = 14$$

### What to Document in `sheet0.2.chat.pdf`:

#### 1. LLM Used:

You used ChatGPT (URL: <https://chatgpt.com/>).

#### 2. Prompts and Responses:

Include screenshots of the chat or document the conversation that helped you with the implementation.

Once you've completed everything, commit the changes to Git, and upload the ZIP file to Moodle.

Let me know if you need help with any part of this task!

The only difference is I split the main function in to a different file just because I'm used to working that way personally basically everything else was kept the same and I had changed which numbers should get converted to decimal just to test whether the output was actually correct.