

Lecture 3:

Exercise 1:

```
const prompt = require("prompt-sync")();
```

```
function minOfTwo(a, b) {  
  return a < b ? a : b;  
}
```

```
// Find minimum of three numbers
```

```
function minOfThree(a, b, c) {  
  return minOfTwo(minOfTwo(a, b), c);  
}
```

```
// Finds minimum of either two or three numbers
```

```
function minOfTwoOrThree(a, b, c = undefined) {  
  if (c === undefined) {  
    // if C isnt defined, it finds the minimum of two numbers  
    return minOfTwo(a, b);  
  } else {  
    //if C is provided, it finds the minimum of three numbers  
    return minOfThree(a, b, c);  
  }  
}
```

```
// log the minoftwoorthree function, because it will print the min or either two or three  
numbers.
```

```
console.log(minOfTwoOrThree(2, 5));  
console.log(minOfTwoOrThree(1, 8, 0));  
console.log(minOfTwoOrThree(24, 85));  
console.log(minOfTwoOrThree(16, 11, 100));
```

Output

```
2  
0  
24  
11
```

Exercise 3:

```
const prompt = require("prompt-sync")();  
  
// Function to find the nth term of the sequence 2, 6, 14, 26, 42 ....  
function findNthNumber1(n) {  
  if (n <= 0) {  
    console.log("N should be a positive number");  
    return; // Return to exit the function if the input is invalid  
  }  
  
  let term = 2; // First term of the sequence  
  let multiple = 4; // Multiple that needs to be added  
  
  for (let j = 1; j < n; j++) {  
    term += multiple;  
    multiple += 4;  
  }  
  
  return term;
```

```
}
```

```
// finds the sixth term in the series
```

```
const n = 6;
```

```
console.log(` The ${n}th term of the series: ${findNthNumber1(n)} `);
```

```
// Function to find the nth term of the factorial sequence 1, 2, 6, 24, 120, 720 ...
```

```
function findNthNumber2(n) {
```

```
  if (n <= 0) {
```

```
    console.log("N should be a positive number");
```

```
    return; // Return to exit the function if the input is invalid
```

```
  }
```

```
  // Calculate factorial of n
```

```
  let result = 1;
```

```
  for (let i = 2; i <= n; i++) {
```

```
    result *= i;
```

```
  }
```

```
  return result;
```

```
}
```

```
// Finds the seventh term in the series
```

```
const n2 = 7;
```

```
console.log(` The ${n2}th term of the series: ${findNthNumber2(n2)} `);
```

```
// Function to find the nth term of the fibonacci series
```

```
function findNthNumber3(n) {
```

```
  if (n <= 0) {
```

```
    console.log("N should be a positive number");
    return; // Return to exit the function if the input is invalid
} else if (n === 1 || n === 2) {
    return 1; // The first and second terms of the Fibonacci sequence are 1
}

let a = 1, b = 1;
for (let i = 3; i <= n; i++) {
    let temp = a + b;
    a = b;
    b = temp;
}
return b;
}
```

// Finds the eighth term in the series

```
const n3 = 8;
```

```
console.log(` The ${n3}th term of the series: ${findNthNumber3(n3)} `);
```

// Function to find the HCF of two numbers

```
function findHcf(a, b) {
    if (a <= 0 && b <= 0) {
        console.log("Both numbers should be positive.");
        return; // Return to exit the function if the input is invalid
    }
}
```

```
while (b) {
```

```

        let number = b;

        b = a % b;

        a = number;
    }

    return a;
}

// Finds the HCF of 24 and 100

const a = 24;
const b = 100;
console.log(` The HCF of ${a} and ${b} is: ${findHcf(a, b)} `);

```

```

// Function to find the LCM of two numbers
function findLcm(a, b) {
    if (a <= 0 || b <= 0) {
        console.log("Both numbers should be positive.");
        return; // Return to exit the function if the input is invalid
    }

    // Calculate LCM using HCF
    return Math.abs(a * b) / findHcf(a, b);
}

```

```

// Finds the LCM of 24 and 100

console.log(` The LCM of ${a} and ${b} is: ${findLcm(a, b)} `);

```

Output:

The 6th term of the series: 62

The 7th term of the series: 5040

The 8th term of the series: 21

The HCF of 24 and 100 is: 4

The LCM of 24 and 100 is: 600

Exercise 4:

```
const prompt = require("prompt-sync")();
```

```
// Function to perform the selected operation
```

```
function performOperation(operation, num1, num2) {  
  if (operation === '1') { // Add  
    return num1 + num2;  
  } else if (operation === '2') { // Subtract  
    return num1 - num2;  
  } else if (operation === '3') { // Multiply  
    return num1 * num2;  
  } else if (operation === '4') { // Divide  
    return num2 !== 0 ? num1 / num2 : 'Error: Division by zero';  
  } else {  
    return 'Invalid operation';  
  }  
}
```

```
// validate if a string can be converted to a valid number
```

```
function getValidNumber(promptText) {  
  while (true) {  
    var input = prompt(promptText);  
    var number = parseFloat(input);
```

```
if (!isNaN(number)) {  
    return number;  
} else {  
    console.log('Invalid number. Please enter a valid number.');}  
}  
}
```

// Main function to display the menu/user input

```
function calculator() {  
    while (true) {  
        // Display the menu  
        const option = prompt(  
            "Please select an option:" +  
            "Press 1 to add, " +  
            "Press 2 to subtract, " +  
            "Press 3 to multiply, " +  
            "Press 4 to divide, " +  
            "Press 5 to quit."  
        );
```

```
        if (option === '1' || option === '2' || option === '3' || option === '4') {  
            // Get two valid numbers from the user  
            var num1 = getValidNumber('Enter the first number: ');  
            var num2 = getValidNumber('Enter the second number: ');  
            // Perform the operation and show the result  
            var result = performOperation(option, num1, num2);
```

```
    console.log('Result: ' + result);  
  } else if (option === '5') {  
    // Exit the program  
    console.log('Exiting the calculator.');
```



```
    break;  
  } else {  
    //invalid option  
    console.log('Please select a valid option.');
```



```
  }  
}  
}
```

// Start the calculator program

```
calculator();
```

Console:

Please select an option:Press 1 to add, Press 2 to subtract, Press 3 to multiply, Press 4 to divide, Press 5 to quit.1

Enter the first number: 1

Enter the second number: 4

Result: 5

Please select an option:Press 1 to add, Press 2 to subtract, Press 3 to multiply, Press 4 to divide, Press 5 to quit.2

Enter the first number: 1

Enter the second number: 4

Result: -3

Please select an option:Press 1 to add, Press 2 to subtract, Press 3 to multiply, Press 4 to divide, Press 5 to quit.3

Enter the first number: 1

Enter the second number: 4

Result: 4

Please select an option: Press 1 to add, Press 2 to subtract, Press 3 to multiply, Press 4 to divide, Press 5 to quit.4

Enter the first number: 1

Enter the second number: 4

Result: 0.25

Please select an option: Press 1 to add, Press 2 to subtract, Press 3 to multiply, Press 4 to divide, Press 5 to quit.5

Exiting the calculator.

Exercise 5:

```
const prompt = require("prompt-sync")();

function multiTable(x, y, z) {
  // this function checks if the input is NaN, for each of the three variables.
  if(isNaN(x) || isNaN(y) || isNaN(z)) {
    console.log("Invalid Input...")
    return;
  }
  for (let i = y; i <= z; i++) {
    console.log(x + "x" + i + "=" + x * i);
  }
  console.log()
}

// while loop to continue asking for input
while (true) {
  let x = Number(prompt("Enter a number: "));
  let y = Number(prompt("Enter starting number: "));
  let z = Number(prompt("Enter ending number: "));
  // calls function to print multiplication table
  multiTable(x, y, z);
}
```

```
}
```

Console:

Enter a number: 3

Enter starting number: 1

Enter ending number: 5

3x1=3

3x2=6

3x3=9

3x4=12

3x5=15

Enter a number: yes

Enter a number: okay

Enter a number: hello

Not a valid input

Undefined

Exercise 6:

// assign input value to x and returning the value

```
function inputNumber() {  
  let input = prompt("Enter a number: ");  
  let x = Number(input);  
  return x;  
}
```

// Creates the multiplication table

```
function multitable () {  
  // defining input variables  
  while (true) {  
    x = inputNumber();  
    y = inputNumber();  
    let minxy = Math.min(x,y);  
    let maxxy = Math.max(x,y);  
    a = inputNumber();  
    b = inputNumber();  
    let minab = Math.min(a,b);  
    let maxab = Math.max(a,b);
```

```

if (isNaN(x) || isNaN(y) || isNaN(a) || isNaN(b)) {
  return "invalid input";
}
else {
  for(let i = minxy; i<= maxxy; i++) {
    for (let i = minab; i<= maxab; i++) {
      console.log(`${x}*${i}=${x*i}`);
    }
    console.log("\n\n");
    x++;
  }
}
}
}

```

```

// excutes the function
console.log(multitable());

```

Console:

Enter a number: 4

Enter a number: 3

Enter a number: 1

Enter a number: 7

4*1=4

4*2=8

4*3=12

4*4=16

4*5=20

4*6=24

4*7=28

$$5*1=5$$

$$5*2=10$$

$$5*3=15$$

$$5*4=20$$

$$5*5=25$$

$$5*6=30$$

$$5*7=35$$