**Name : Nayan Mandliya**

**Roll No. : 1911027**

**Batch : MERN 1**

**Experiment No. : 1**

**1) Basic Routing :**

**Q) Build First server application using http module**

**Code :**

const http=require("http");//required module to build server

//server created

const server=http.createServer((req,res)=>{

    res.end("This is working fine and server is created successfully!!");

})

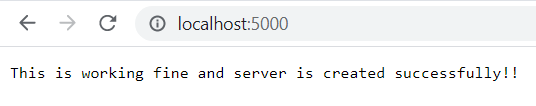
//server listening on port 5000

server.listen(5000,()=>{

    console.log("Server is listening on port 5000!!!");

})

**Output :**





**Q) Basic routing: Demonstrate it using simple HTML/Json file.**

**Code :**

const http=require("http");//required module to build server

const fs=require('fs')

//server created and routing inserted

const server=http.createServer((req,res)=>{

    if(req.url=='/')

    {

        fs.readFile('base.html',(err,data)=>{

            res.write(data);

            res.end();

        })

    }

    else if(req.url=='/home')

    {

        fs.readFile('home.html',(err,data)=>{

            res.write(data);

            res.end();

        })

    }

    else if(req.url=='/about')

    {

        fs.readFile('about.html',(err,data)=>{

            res.write(data);

            res.end();

        })

    }

    else if(req.url=='/contact')

    {

        fs.readFile('contact.json',(err,data)=>{

            res.write(data);

            res.end();

        })

    }

    else

    {

        fs.readFile('error.html',(err,data)=>{

            res.write(data);

            res.end();

        })

    }

})

//server listening on port 5000

server.listen(5000,()=>{

    console.log("Server is listening on port 5000!!!");

})

**Base.html :**

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>Document</title>

    <style>

        p{

            padding: 50px 50px 70px 70px;

            color: green;

            background-color: black;

            font-size: 100px;

        }

    </style>

</head>

<body>

    <p>This is the base page of my website. Having color as green.</p>

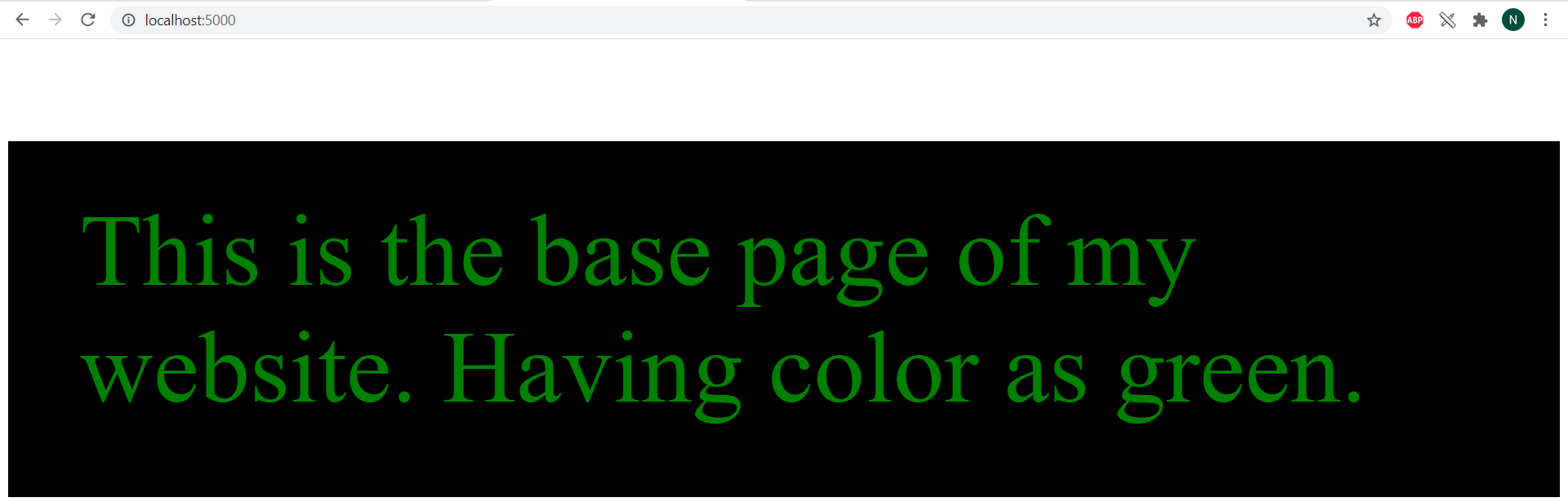
</body>

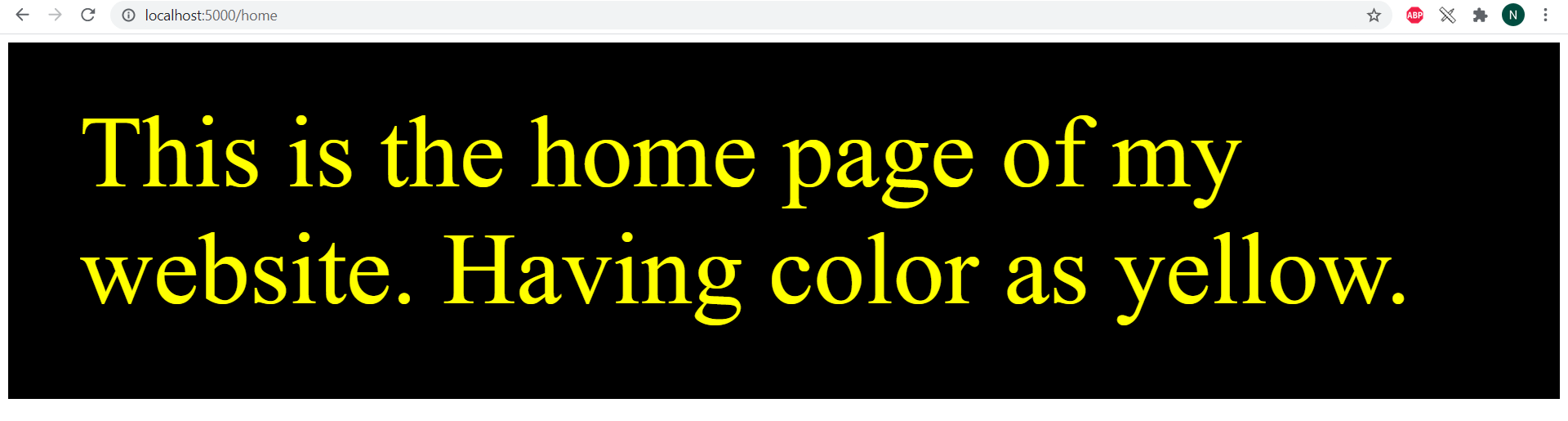
</html>

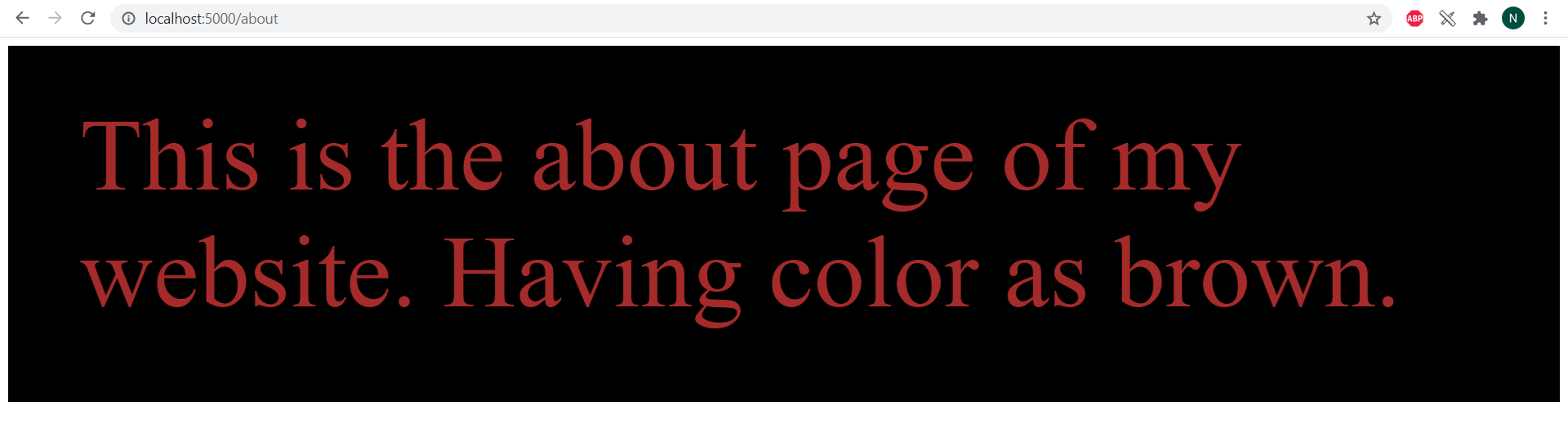
**Code of home.html, about.html, contact.html and error.html is same as base.html only some text is changed.**

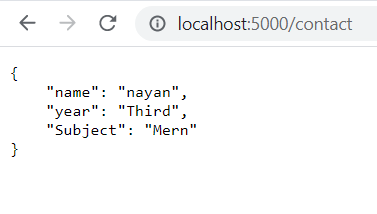
**Output :**

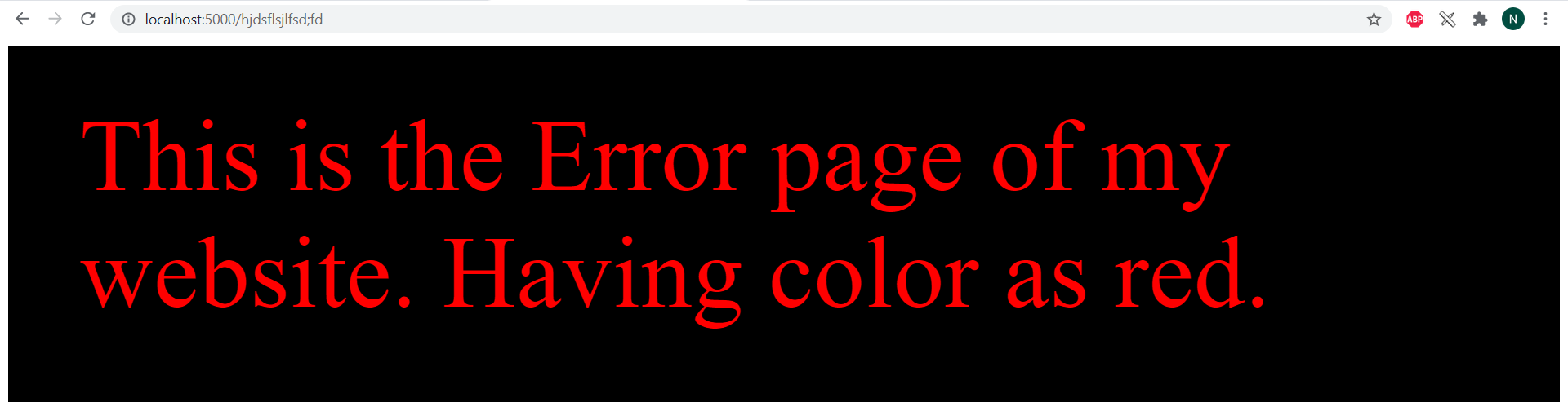












**Q) Demonstrate the callback in node.js.**

**Code :**

const http=require('http');

const fs=require('fs');

const server=http.createServer((req,res)=>{

    res.write("First file reading started");

    fs.readFile('first.txt',(data,err)=>{

        if(err)

        {

            console.log("There is some error generated!!")

        }

        else

        {

            res.write(data.toString());

            res.write("First file reading done!!!");

        }

    })

    res.write("Second file reading started");

    fs.readFile('second.txt',(data,err)=>{

        if(err)

        {

            console.log("There is some error generated!!")

        }

        else

        {

            res.write(data.toString());

            res.write("Second file reading done!!!");

        }

    })

    res.write("Third file reading started");

    fs.readFile('third.txt',(data,err)=>{

        if(err)

        {

            console.log("There is some error generated!!")

        }

        else

        {

            res.write(data.toString());

            res.write("Third file reading done!!!");

        }

    })

    res.end();

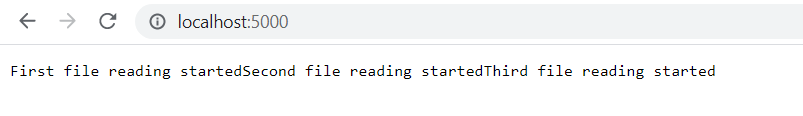
})

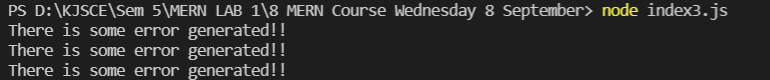
server.listen(5000,()=>{

    console.log("Server listening on port 5000!!!");

})

**Output :**





**As there are no files like first.txt, second.txt and third.txt error will be generated and returned by callback function.**

**2) Event Emitter**

**Q) Demonstrate the use of Event Emitter for ATM Application. (Step-wise all events Occurs at ATM Machine like withdraw amount, checking balance etc...).**

**Code :**

const prompt=require('prompt-sync')();

var n=0;

const eventobj=require('events');

const e = require('express');

var emitter=new eventobj.EventEmitter();

var accounts=[["Nayan Mandliya", 11110, "0934", 35000, 9967890289],["Jane Doe", 11111, "1289", 37000, 9784845289],["John Doe", 11112, "7512", 39000, 7812456887],["Scar Dean", 11113, "5614", 49000, 6357524897],["Robert Wilkist", 11114, "4500", 45000, 8879754125]]

emitter.on('get\_details',(acc\_no)=>{

    var i;

    var flag=0;

    for(i=0;i<accounts.length;i++)

    {

        if(accounts[i][1]==acc\_no)

        {

            flag=1;

            var pass=prompt("\t\t\t\t\tPlease enter PIN : ");

            console.log("--------------------------------------------------------------------------------------------------------------------------");

            if(pass==accounts[i][2])

            {

                console.log(`\t\t\t\t\tAccount Number : ${accounts[i][1]}`);

                console.log(`\t\t\t\t\tName : ${accounts[i][0]}`);

                console.log(`\t\t\t\t\tAccount Balance : ${accounts[i][3]}`);

                console.log(`\t\t\t\t\tPhone Number : ${accounts[i][4]}`);

                console.log("--------------------------------------------------------------------------------------------------------------------------");

                break;

            }

            else

            {

                console.log("\t\t\t\t\tEntered PIN is wrong please try again!!");

                console.log("--------------------------------------------------------------------------------------------------------------------------");

                break;

            }

        }

    }

    if(flag==0)

    {

        console.log("\t\t\t\t\tAccount not found!!!");

        console.log("--------------------------------------------------------------------------------------------------------------------------");

    }

    emitter.emit('clicker');

})

emitter.on('withdraw',(acc\_no)=>{

    var i;

    var flag=0;

    for(i=0;i<accounts.length;i++)

    {

        if(accounts[i][1]==acc\_no)

        {

            flag=1;

            var pass=prompt("\t\t\t\t\tPlease enter PIN : ");

            console.log("--------------------------------------------------------------------------------------------------------------------------");

            if(pass==accounts[i][2])

            {

                console.log(`\t\t\t\t\tAvailable Clear Balance : ${accounts[i][3]}`);

                console.log("--------------------------------------------------------------------------------------------------------------------------");

                var amount=prompt("\t\t\t\t\tPlease enter amount to withdraw : ");

                console.log("--------------------------------------------------------------------------------------------------------------------------");

                if(amount<=0)

                {

                    console.log("\t\t\t\t\tAmount must be greater than or equal to 0!!");

                    console.log("--------------------------------------------------------------------------------------------------------------------------");

                }

                else if(amount>accounts[i][3])

                {

                    console.log("\t\t\t\t\tAmount entered must be less than available clear balance!!");

                    console.log("--------------------------------------------------------------------------------------------------------------------------");

                }

                else

                {

                    accounts[i][3]=accounts[i][3]-amount;

                    console.log("\t\t\t\t\tPlease collect your cash from bottom!!");

                    console.log("--------------------------------------------------------------------------------------------------------------------------");

                }

                break;

            }

            else

            {

                console.log("\t\t\t\t\tEntered PIN is wrong please try again!!");

                console.log("--------------------------------------------------------------------------------------------------------------------------");

                break;

            }

        }

    }

    if(flag==0)

    {

        console.log("\t\t\t\t\tAccount not found!!!");

        console.log("--------------------------------------------------------------------------------------------------------------------------");

    }

    emitter.emit('clicker');

})

emitter.on('pin\_change',(acc\_no)=>{

    var i;

    var flag=0;

    for(i=0;i<accounts.length;i++)

    {

        if(accounts[i][1]==acc\_no)

        {

            flag=1;

            var pass=prompt("\t\t\t\t\tPlease enter old PIN : ");

            console.log("--------------------------------------------------------------------------------------------------------------------------");

            if(pass==accounts[i][2])

            {

                console.log(`\t\t\t\t\tAccount Number : ${accounts[i][1]}`);

                console.log(`\t\t\t\t\tName : ${accounts[i][0]}`);

                console.log(`\t\t\t\t\tAccount Balance : ${accounts[i][3]}`);

                console.log(`\t\t\t\t\tPhone Number : ${accounts[i][4]}`);

                console.log("--------------------------------------------------------------------------------------------------------------------------");

                var pass1=prompt("\t\t\t\t\tPlease enter new PIN : ");

                console.log("--------------------------------------------------------------------------------------------------------------------------");

                var pass2=prompt("\t\t\t\t\tConfirm PIN : ");

                console.log("--------------------------------------------------------------------------------------------------------------------------");

                if(pass1==pass2)

                {

                    accounts[i][2]=pass2;

                    console.log("\t\t\t\t\tPIN changed successfully");

                    console.log("--------------------------------------------------------------------------------------------------------------------------");

                }

                else

                {

                    console.log("\t\t\t\t\tYou have entered different password please try again!!!");

                    console.log("--------------------------------------------------------------------------------------------------------------------------");

                }

                break;

            }

            else

            {

                console.log("\t\t\t\t\tEntered PIN is wrong please try again!!");

                console.log("--------------------------------------------------------------------------------------------------------------------------");

                break;

            }

        }

    }

    if(flag==0)

    {

        console.log("\t\t\t\t\tAccount not found!!!");

        console.log("--------------------------------------------------------------------------------------------------------------------------");

    }

    emitter.emit('clicker');

})

emitter.on('exit',()=>{

    console.log("\t\t\t\t\tThank you for visiting!!!");

    console.log("--------------------------------------------------------------------------------------------------------------------------");

})

emitter.on('invalid',()=>{

    console.log("\t\t\t\t\tInvalid input");

    console.log("--------------------------------------------------------------------------------------------------------------------------");

    emitter.emit('clicker');

})

emitter.on('shower',()=>{

    console.clear();

    console.log("--------------------------------------------------------------------------------------------------------------------------");

    console.log("--------------------------------------------------MERN BANK---------------------------------------------------------------");

    console.log("--------------------------------------------------------------------------------------------------------------------------");

})

emitter.on('clicker',()=>{

    var int=prompt("\t\t\t\t\tPress enter to continue : ");

})

while(n!=4)

{

    console.clear();

    console.log("--------------------------------------------------------------------------------------------------------------------------");

    console.log("--------------------------------------------------MERN BANK---------------------------------------------------------------");

    console.log("--------------------------------------------------------------------------------------------------------------------------");

    console.log("\t\t\t\t\t1. Get Details of your account.\n\t\t\t\t\t2. Withdraw money.\n\t\t\t\t\t3. Change PIN\n\t\t\t\t\t4. Exit");

    console.log("--------------------------------------------------------------------------------------------------------------------------");

    n=prompt("\t\t\t\t\tEnter you choice : ");

    if(n==1)

    {

        emitter.emit('shower');

        var acc\_no=prompt("\t\t\t\t\tPlease enter acount number : ");

        console.log("--------------------------------------------------------------------------------------------------------------------------");

        emitter.emit('get\_details', acc\_no);

    }

    else if(n==2)

    {

        emitter.emit('shower');

        var acc\_no=prompt("\t\t\t\t\tPlease enter acount number : ");

        console.log("--------------------------------------------------------------------------------------------------------------------------");

        emitter.emit('withdraw', acc\_no);

    }

    else if(n==3)

    {

        emitter.emit('shower');

        var acc\_no=prompt("\t\t\t\t\tPlease enter acount number : ");

        console.log("--------------------------------------------------------------------------------------------------------------------------");

        emitter.emit('pin\_change', acc\_no);

    }

    else if(n==4)

    {

        emitter.emit('shower');

        emitter.emit('exit');

    }

    else

    {

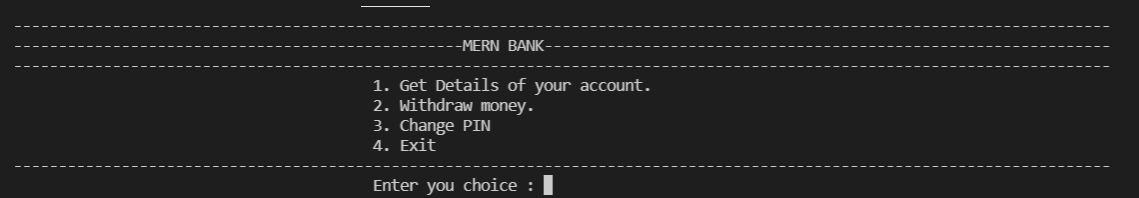
        emitter.emit('shower');

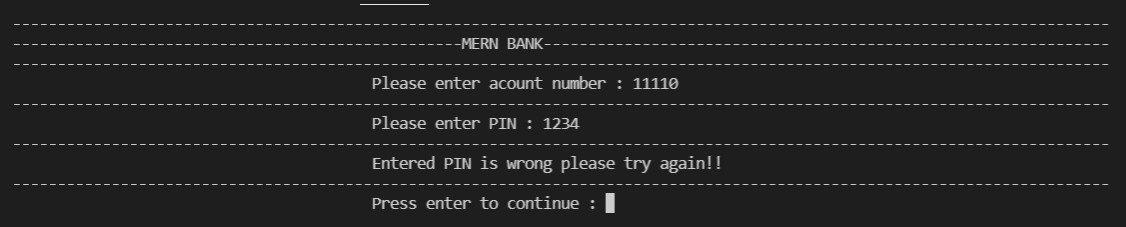
        emitter.emit('invalid');

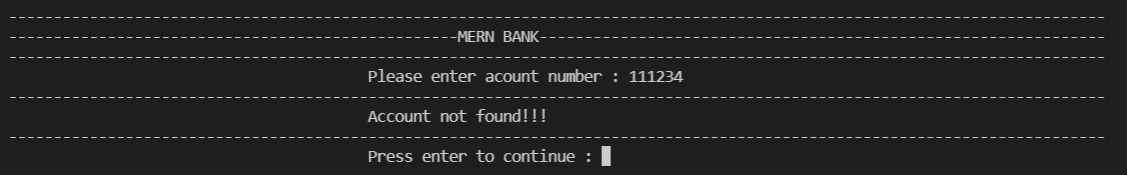
    }

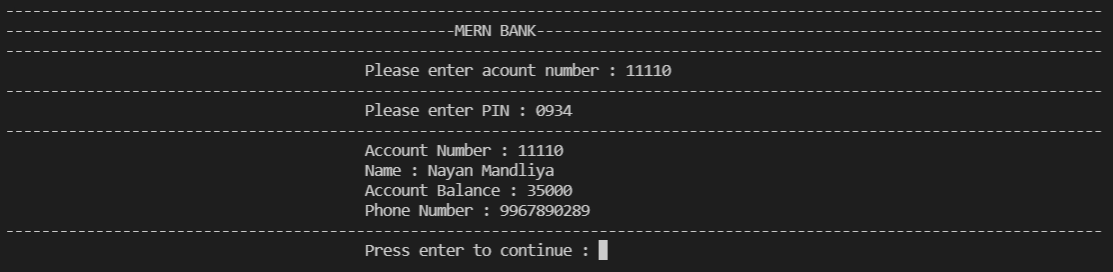
}

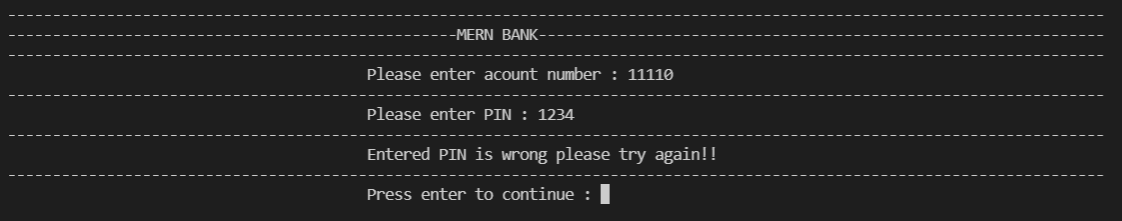
**Output :**

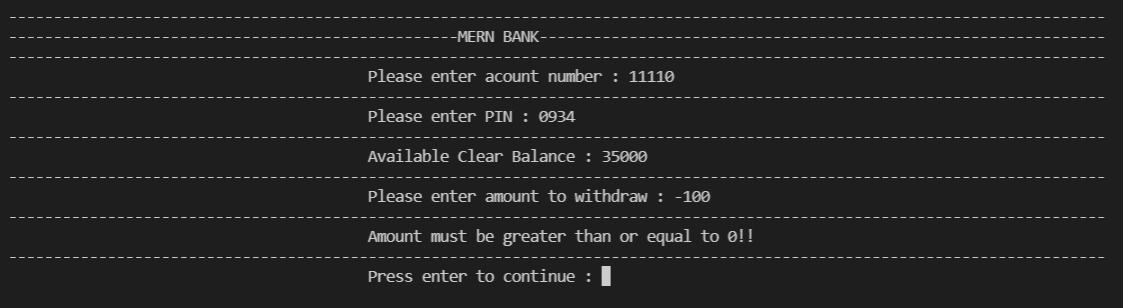
****

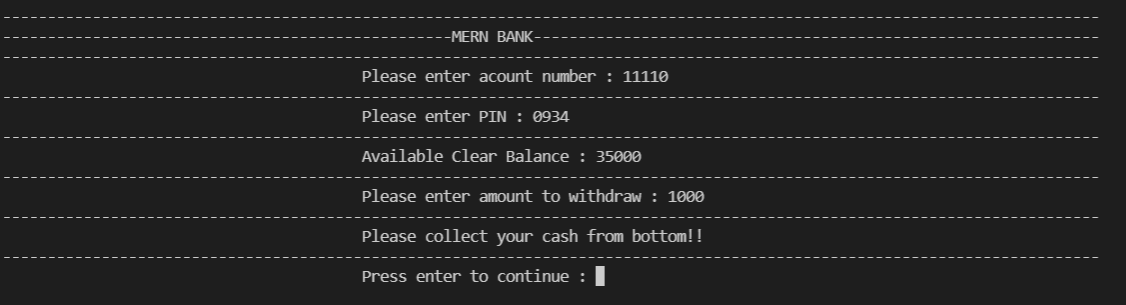
****

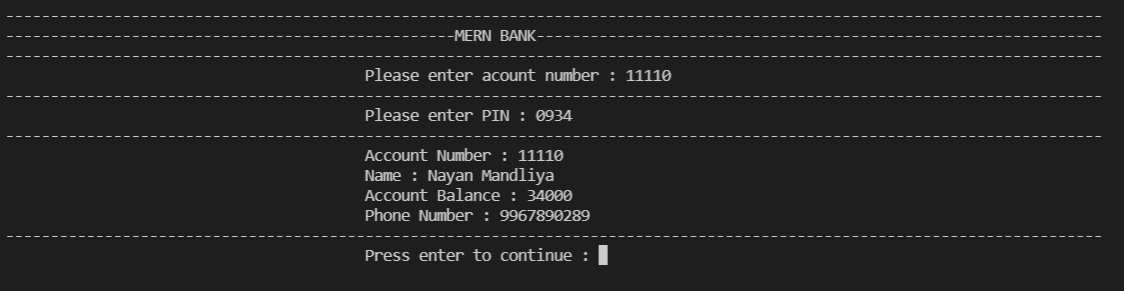
****

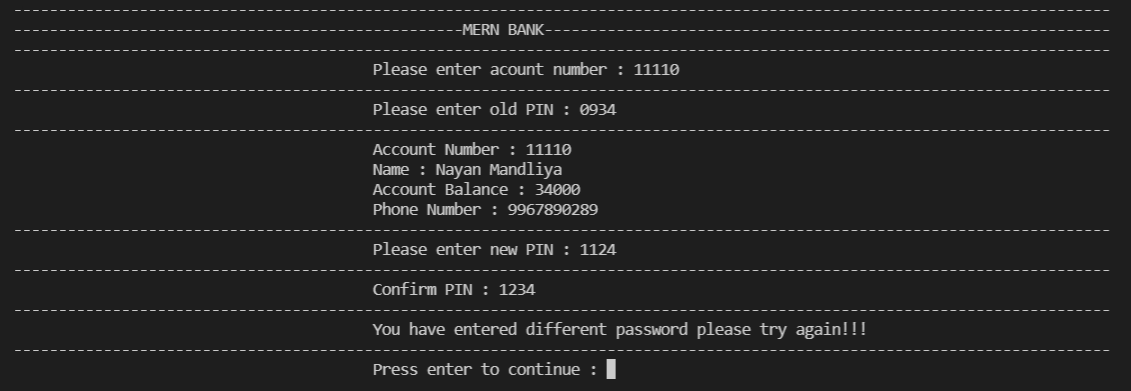
****

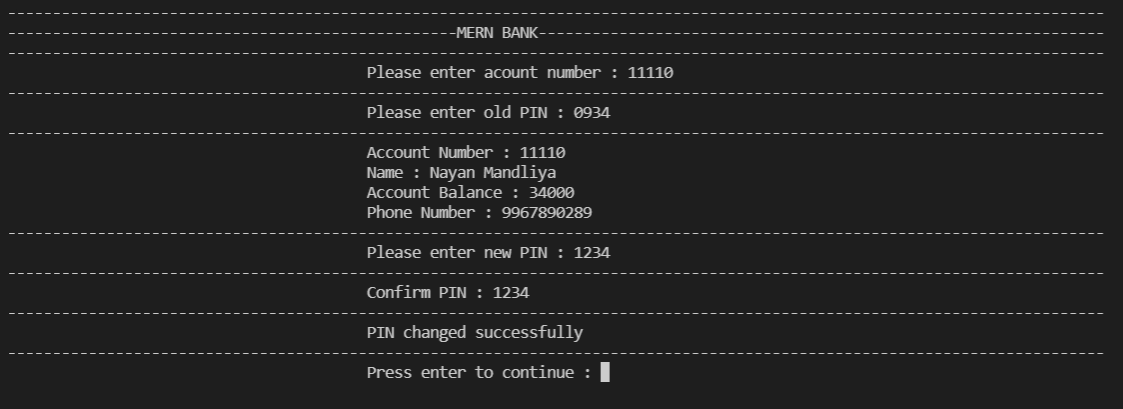
****

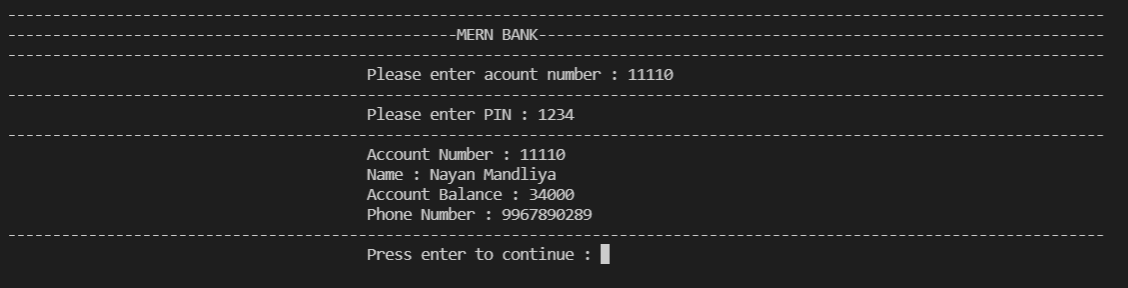
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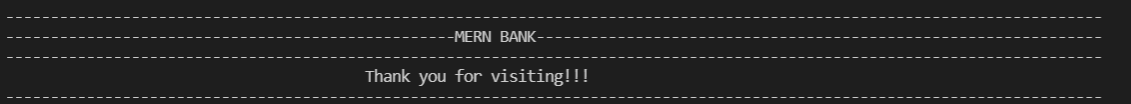
****

****

****

****

****

****

**3) File operation**

**Q) Check Permissions of a File or Directory.**

**Code :**

const fs=require('fs');

const prompt=require('prompt-sync')();

var file=prompt("Enter name of the file/folder : ");

var flag=0;

fs.access(file, fs.constants.X\_OK, (err)=>{

    if(err)

    {

        console.log(`${file} doesnt exists!!!`);

        flag=1;

    }

    else

    {

        console.log(`${file} can be executed!!!`);

    }

});

fs.access(file, fs.constants.R\_OK, (err)=>{

    if(!err)

    {

        console.log(`${file} can be Readed!!!`);

    }

});

fs.access(file, fs.constants.W\_OK, (err)=>{

    if(!err)

    {

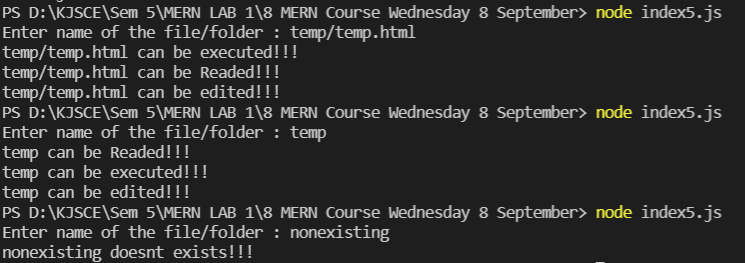
        console.log(`${file} can be edited!!!`);

    }

});

**Directory structure : **

**Output :**

****

**Q) Checking if a file or a directory exists.**

**Code :**

const fs=require('fs');

const prompt=require('prompt-sync')();

var file=prompt("Enter name of the file/folder : ");

fs.access(file,(err)=>{

    if(err)

    {

        console.log(`${file} doesn't exists!!!`);

    }

    else    {

        console.log(`${file} exists!!!`);

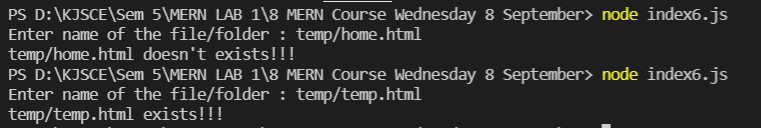
    }

});

**Directory Structure :**

****

**Output :**

****

**Q) Determining the line count of a text file.**

**Code :**

const fs=require('fs');

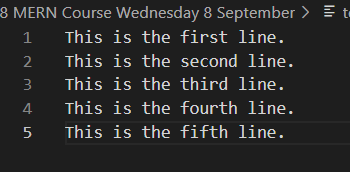
fs.readFile('text.txt',(err,data)=>{

    const d=data.toString().split('\n');

    console.log(`Number of lines in the text.txt is : ${d.length}`);

})

**text.txt :**

****

**Output :**

****

**Q) Reading a file line by line.**

**Method 1: Using readline**

**Code :**

const fs=require('fs')

const readline=require('readline')

const readInterface = readline.createInterface({

    input: fs.createReadStream('text.txt'),

    output: process.stdout

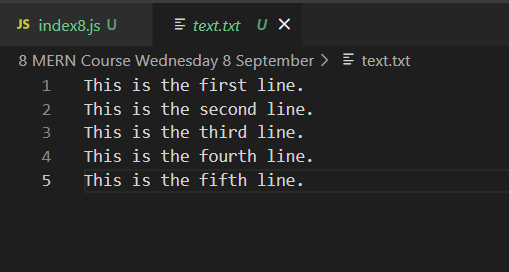
});

readInterface.on('\n', function(line) {

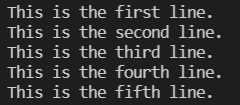
    console.log(line);

});

**Text.txt:**

****

**Output :**

****

**Method 2 : Using linereader**

**Code :**

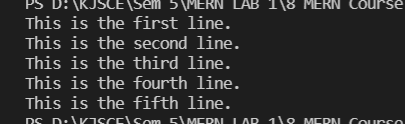
const line=require('line-reader')

line.eachLine('text.txt',(line)=>{

    console.log(line);

})

**Output :**

****

**Q) See the file content through browser.**

**Code :**

const fs=require('fs');

const http=require('http');

const prompt=require('prompt-sync')();

file=prompt("Please enter the name of the file (filename.extention): ");

const server=http.createServer((req,res)=>{

    fs.access(file,(err)=>{

        if(err)

        {

            res.end("File Doesnt exists please re run the server!!!");

        }

        else

        {

            const stream=fs.createReadStream(file);

            stream.pipe(res);

        }

    });

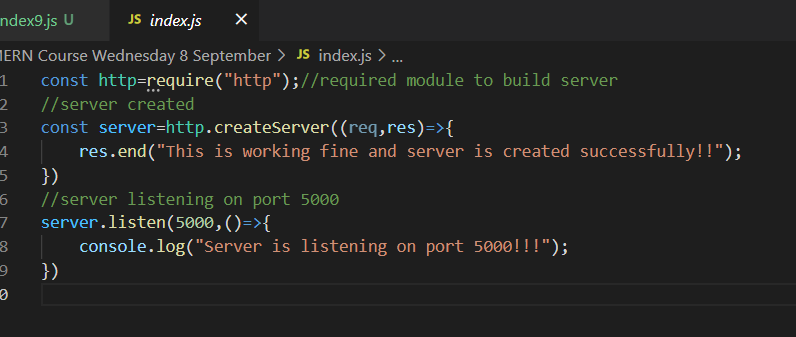
})

server.listen(5000,(req,res)=>{

    console.log("Server listening on port 5000!!");

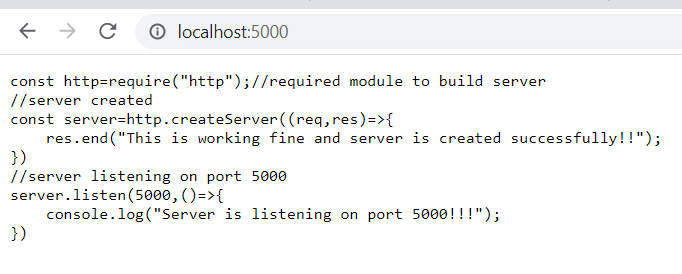
})

**Index.js :**

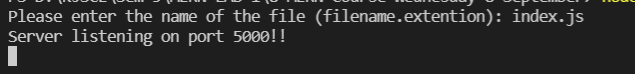
****

**Output :**

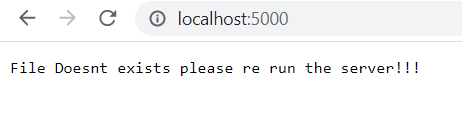
**Browser :**

****

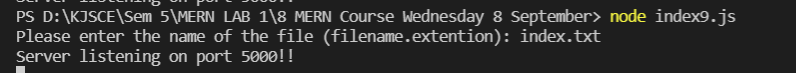
**Console :**

****

**If file doesn’t exists : Browser**

****

**Console :**

****

**4) Building your custom modules**

**Q) To demonstrate this use some mathematics function to create custom module.**

**HTML code :**

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>Document</title>

</head>

<body>

    <form action="http://localhost:5000/example" method="POST">

        Enter Expression: <input type="text" name="expr"><br>

       <button type="submit">Calculate</button>

      </form>

</body>

</html>

**Code :**

const express=require('express');

const bodyParser=require('body-parser');

const app=express();

const add=require('./add');

const sub=require('./sub');

const mul=require('./mul');

const div=require('./div');

const sinval=require('./sin');

const cosval=require('./cos');

const tanval=require('./tan');

app.use(bodyParser.urlencoded({ extended: true }));

app.post('/example', (req, res) => {

    if(req.body.expr[1]=='+')

    {

        var temp=add(Number(req.body.expr[0]),Number(req.body.expr[2]));

        res.send(`Answer : ${temp}`);

    }

    else if(req.body.expr[1]=='-')

    {

        var temp=sub(Number(req.body.expr[0]),Number(req.body.expr[2]));

        res.send(`Answer : ${temp}`);

    }

    else if(req.body.expr[1]=='\*')

    {

        var temp=mul(Number(req.body.expr[0]),Number(req.body.expr[2]));

        res.send(`Answer : ${temp}`);

    }

    else if(req.body.expr[1]=='/')

    {

        var temp=div(Number(req.body.expr[0]),Number(req.body.expr[2]));

        res.send(`Answer : ${temp}`);

    }

    else if(req.body.expr.slice(0,3)=='sin')

    {

        var temp=sinval(Number(req.body.expr.slice(3,5)));

        res.send(`Answer : ${temp}`);

    }

    else if(req.body.expr.slice(0,3)=='cos')

    {

        var temp=cosval(Number(req.body.expr.slice(3,5)));

        res.send(`Answer : ${temp}`);

    }

    else if(req.body.expr.slice(0,3)=='tan')

    {

        var temp=tanval(Number(req.body.expr.slice(3,5)));

        res.send(`Answer : ${temp}`);

    }

    else

    {

        res.send("Answer : Undefined");

    }

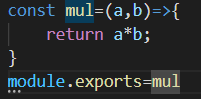
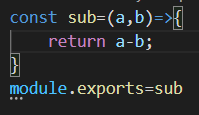
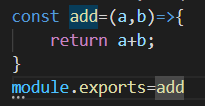
});

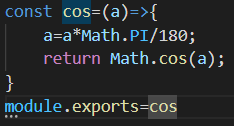
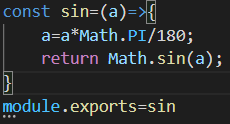
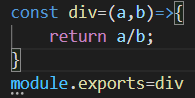
app.listen(5000, () => {

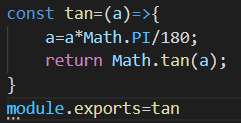
  console.log(`Server running on 5000!!`);

});

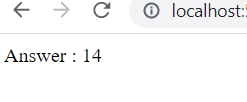
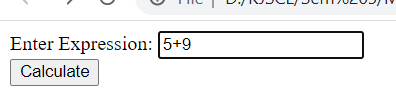
**Modules Created :**

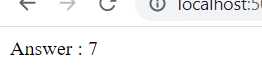
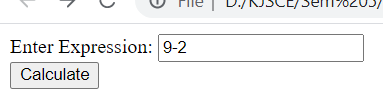
****

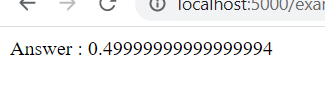
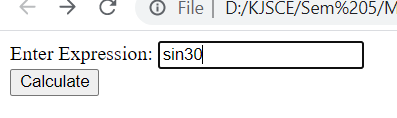
****

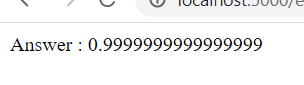
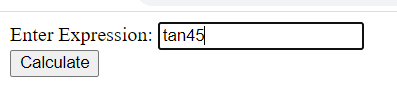
****

**Output :**

****

****

****

****

**5) Command Line operations using Nodejs**

**Q) Make use of Readline and Inquirer.**

**Readline :**

**Code :**

const readline=require('readline');

const fs=require('fs');

const readline2=readline.createInterface({

  input: process.stdin,

  output: process.stdout,

});

readline2.question('First Name : ',fname=>{

  readline2.question('Last Name : ',lname=>{

    readline2.question('Roll No. : ',roll=>{

      readline2.question('Class : ',css=>{

        readline2.question('Phone No. : ',phno=>{

          console.log("-------------------------------------------------");

          console.log("|\t\tID CARD\t\t\t\t|");

          console.log("-------------------------------------------------");

          console.log(`|\tName : ${fname} ${lname}\t\t\t|`);

          console.log("-------------------------------------------------");

          console.log(`|\tRoll No. : ${roll}\t\t\t|`);

          console.log("-------------------------------------------------");

          console.log(`|\tClass : ${css}\t\t\t|`);

          console.log("-------------------------------------------------");

          console.log(`|\tPhone No. : ${phno}\t\t\t|`);

          console.log("-------------------------------------------------");

          readline2.close();

        })

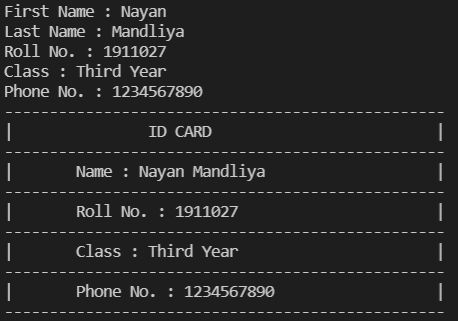
      })

    })

  })

})

**Output :**

****

**Inquirer :**

**Code :**

const inquirer=require('inquirer')

var questions=[

    {

        type: 'text',

        name: 'fname',

        message: "First name : "

    },

    {

        type: 'text',

        name: 'lname',

        message: "Last name : "

    },

    {

        type: 'password',

        name: 'pass',

        message: 'Enter password : ',

    },

    {

        type: 'text',

        name: 'course',

        message: 'Course Name : ',

        default: 'MERN'

    },

    {

        type: 'list',

        name: 'first',

        message: 'Option 1 : ',

        choices: ['MERN Stack', 'MEAN Stack', 'Django', 'Flutter', 'PHP', 'Wordpress'],

    },

    {

        type: 'checkbox',

        name: 'second',

        message: 'Option 2 : ',

        choices: ['MERN Stack', 'MEAN Stack', 'Django', 'Flutter', 'PHP', 'Wordpress'],

      },

]

inquirer.prompt(questions).then(answers=>{

    console.log("-------------------------------------------------------------------------------------------------------");

    console.log("Students Info : ");

    console.log("-------------------------------------------------------------------------------------------------------");

    console.log(`Hello ${answers['fname']} ${answers['lname']} you have been successfully logged in!!!`);

    console.log("-------------------------------------------------------------------------------------------------------");

    console.log(`${answers['fname']} is currently learning ${answers['course']}`);

    console.log("-------------------------------------------------------------------------------------------------------");

    console.log(`First choice ${answers['first']}`);

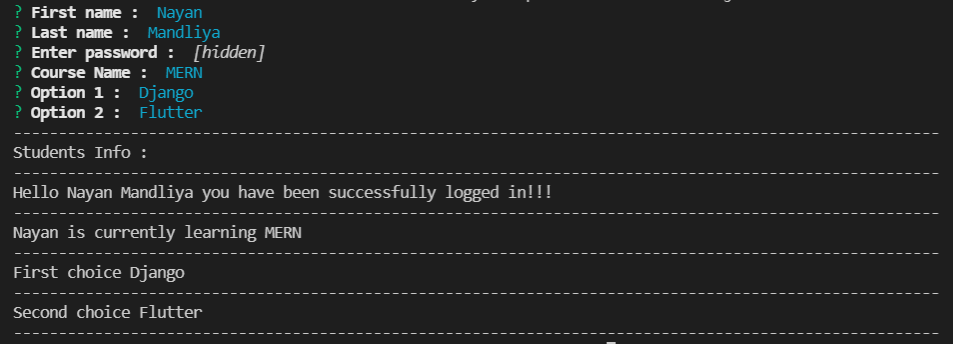
    console.log("-------------------------------------------------------------------------------------------------------");

    console.log(`Second choice ${answers['second']}`);

    console.log("-------------------------------------------------------------------------------------------------------");

})

**Output :**

****