

TITLE

VALIDATION & VERIFICATION

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Abstract

The following project is based on the construction of a communication module based on the use of Socket Programming between two or more Nodes in a Network.

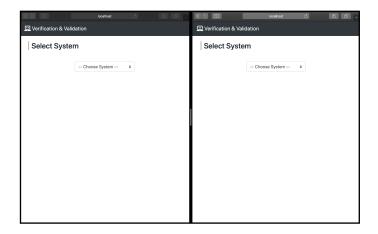
This Module ensures communication between two different nodes but not to the same node.

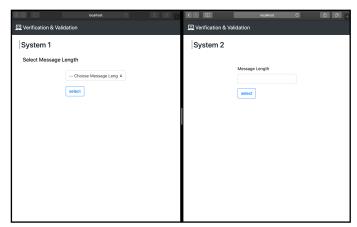
The first step to establish a connection between the nodes is to launch the object code in the terminal for execution.

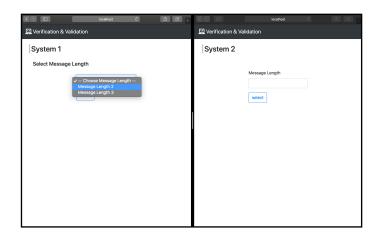
The next step is to specify the number of data bits that are to be transmitted from the source node to the destination node after which the corresponding data is sent from one node to another and stored in the Database for future reference and query processing. This form of Communication is of Full Duplex mode and hence data can be sent and received simultaneously between the connected nodes.

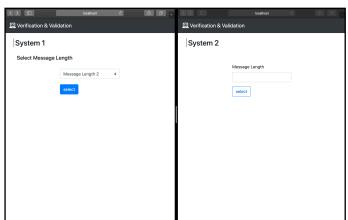
After the successful transmission of data, the connection is terminated until future requests.

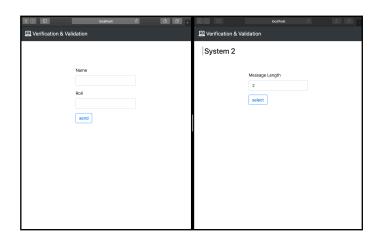
Screenshot

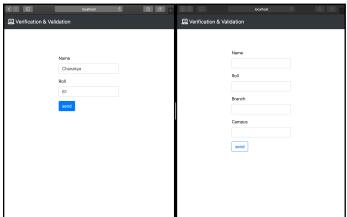


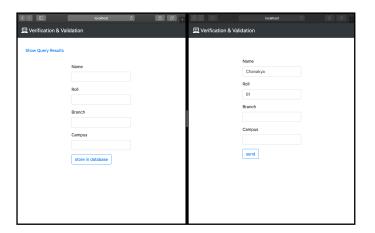


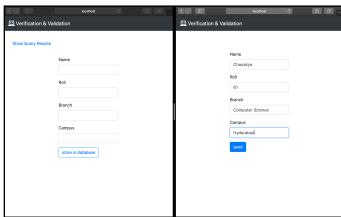


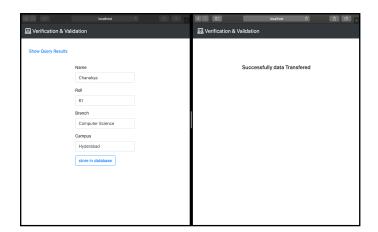


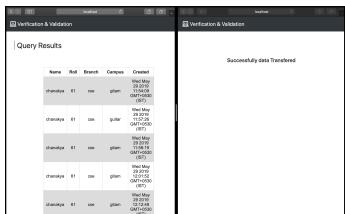












Source Code

app.js

```
var express = require('express');
var app = express();
var socket = require('socket.io');
var bodyParser = require('body-parser');
app.use(bodyParser.urlencoded({ extended: false }))
// App setup
var mongoose = require('mongoose');
mongoose.connect("mongodb://localhost:27017/BlogApp",
{ useNewUrlParser: true });
var ml2 = require("./models/db_ml2");
var r ml2 = require("./models/db return msg2");
var server = app.listen(3000, function(){
  console.log('listening for requests on port 3000,');
});
// Static files
app.use(express.static('public'));
app.get('/',function(reg,res)
{
      res.render("select.ejs");
});
app.get('/home',function(req,res){
      if(req.query.sel==1){
            res.redirect('/system1');}
      else{
            res.redirect('/system2');}
});
// system 1 routes
app.get('/system1',function(req,res){
      res.render("msglen.eis");
});
```

```
app.get('/system1/msglen',function(reg,res){
if(req.query.sel == 2){}
      res.redirect('/system1/msglen2');}
else{
      res.render("msglen3.ejs");}
});
app.get('/system1/msglen2',function(req,res){
      res.render("msglen2.ejs");
});
app.post('/system1/msglen2',function(req,res){
      var newData = new ml2({
            name:req.body.name,
            roll:req.body.roll
     });
            ml2.create(newData,function(err,newdata){
            if(err){
                  console.log(err);}
            else{
                  res.redirect('/system1/display2');}
      })
});
app.post('/system1/msglen3',function(reg,res)
      var newData = new ml3({
            name:req.body.name,
            age:req.body.age,
            address:req.body.address
      });
      ml3.create(newData,function(err,newdata)
            if(err){
                  console.log(err);}
            else{
                  console.log(newdata);}
      })
});
app.get('/system1/display2',function(req,res)
      res.render("display2.ejs");
if(req.query.name!=undefined)
```

```
{
var newData = new r ml2({
      name:req.query.name,
      roll:req.query.roll,
      branch:req.query.branch,
      campus:req.query.campus
});
r_ml2.create(newData,function(err,newdata)
      if(err){
            console.log(err);}
      else{
            console.log(newdata);}
});
}
});
app.get('/system1/result',function(req,res)
      r ml2.find({},function(err,result){
            res.render("result.ejs",{result:result});
      })
})
app.get('/system1/msglen3',function(req,res){
      res.render("msglen3.ejs");
})
// system 2 routes
app.get('/system2',function(reg,res){
      res.render("second.ejs");
});
app.get('/system2/msglen2',function(reg,res){
      console.log(req.query.msglen);
      res.render("secondmsglen2.ejs");
});
app.get('/system2/transfer',function(reg,res){
      res.render("success.ejs");
})
```

```
// websocket part
var io = socket(server);
io.on('connection', (socket) => {
  console.log('made socket connection', socket.id);
  // Handle chat event
  socket.on('chat', function(data){
     console.log(data);
     io.sockets.emit('chat', data);
  });
  socket.on('dataTransfer',function(data1){
     console.log(data1);
     io.sockets.emit('dataTransfer',data1);
  })
  socket.on('dataReturn',function(data2){
     console.log(data2);
     io.sockets.emit('dataReturn',data2);
  })
});
select.ejs
<!DOCTYPE html>
<html>
<head>
      <title></title>
      <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/</pre>
bootstrap/4.3.1/css/bootstrap.min.css" integrity="sha384-
ggOyR0iXCbMQv3Xipma34MD+dH/1fQ784/j6cY/
iJTQUOhcWr7x9JvoRxT2MZw1T" crossorigin="anonymous">
      k rel="stylesheet" href="https://use.fontawesome.com/releases/
v5.8.2/css/all.css" integrity="sha384-
oS3vJWv+0UjzBfQzYUhtDYW+Pj2yciDJxpsK1OYPAYjqT085Qq/
1cq5FLXAZQ7Ay" crossorigin="anonymous">
```

```
<link href="https://fonts.googleapis.com/css?</pre>
family=Advent+Pro&display=swap" rel="stylesheet">
      <style type="text/css">
            html,body{
                  margin:0;
                  width: 100%;
                  height: 100%;
                  background-image: url('back2.jpg');
                  background-repeat: no-repeat;
                  background-size: contain;
                  background-position: center;
            }
            .container{
                  position: absolute;
                  top: 20vh;
                  left: 30vw;
                  width: 40vw;
            }
            .container2{
                  position: absolute;
                  width: 30vw;
                  left: 35vw;
                  top: 30vh;
            }
            .text{
                  width: 20vw;
                  margin-top: 5%;
            }
            input{
                  margin-top: 0;
                  margin-bottom: 3%;
                  width: 50vw;
                  color: black;
                  font-weight: bold;
            }
            h1{
                  font-size: 28px;
                  position: absolute;
                  top: 10vh;
                  left:5vw;
                  border-left: 2px solid gray;
```

```
padding-left: 10px;
           }
     </style>
</head>
<body>
<!-- Image and text -->
<nav class="navbar navbar-dark bg-dark">
 <a class="navbar-brand" href="#">
  <i class="fas fa-laptop-code"></i>
  Verification & Validation
 </a>
</nav>
<h1>Select System</h1>
<div class="container">
<form action="/home" method="get" onchange="this.form.submit()">
<select name="sel" class="custom-select custom-select"</pre>
onchange="this.form.submit()">
     <option>-- Choose System --</option>
<option value = 1>System 1
<option value=2>System 2</option>
</select>
</form>
</body>
</html>
msglen2.ejs
<html>
<head>
      <script src="https://cdnjs.cloudflare.com/ajax/libs/socket.io/1.7.3/</pre>
socket.io.js"></script>
      <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/</pre>
bootstrap/4.3.1/css/bootstrap.min.css" integrity="sha384-
ggOyR0iXCbMQv3Xipma34MD+dH/1fQ784/j6cY/
iJTQUOhcWr7x9JvoRxT2MZw1T" crossorigin="anonymous">
```

```
k rel="stylesheet" href="https://use.fontawesome.com/releases/
v5.8.2/css/all.css" integrity="sha384-
oS3vJWv+0UjzBfQzYUhtDYW+Pj2yciDJxpsK1OYPAYjqT085Qq/
1cq5FLXAZQ7Ay" crossorigin="anonymous">
k href="https://fonts.googleapis.com/css?
family=Advent+Pro&display=swap" rel="stylesheet">
<style type="text/css">
     .container{
           width: 40vw;
           margin-left: 30vw;
           position: absolute;
           top: 20vh;
</style>
</head>
<body>
<nav class="navbar navbar-dark bg-dark">
 <a class="navbar-brand" href="/">
  <i class="fas fa-laptop-code"></i>
   Verification & Validation
 </a>
</nav>
<form action="/system1/msglen2" method="post">
<div class="container">
<div class="form-group">
  <label >Name</label>
  <input type="text" class="form-control" id="name" name="name" >
</div>
<div class="form-group">
  <label >Roll</label>
  <input type="text" class="form-control" id="roll" name="roll" >
</div>
<button type="submit" class="btn btn-outline-primary" id="send">send/
button>
</div>
```

```
</form>
<script src="/ws msglen2.js"></script>
</body>
</html>
ws msglen2.js
var socket = io.connect('http://localhost:3000');
var name1 = document.getElementById('name'),
roll = document.getElementById('roll'),
btn = document.getElementById('send');
btn.addEventListener('click', function(){
  socket.emit('dataTransfer', {
     name: name1.value,
     roll:roll.value
  });
});
second.ejs
<html>
<head>
<script src="https://cdnjs.cloudflare.com/ajax/libs/socket.io/1.7.3/</pre>
socket.io.is"></script>
<link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/</pre>
4.3.1/css/bootstrap.min.css" integrity="sha384-
ggOyR0iXCbMQv3Xipma34MD+dH/1fQ784/j6cY/
iJTQUOhcWr7x9JvoRxT2MZw1T" crossorigin="anonymous">
     k rel="stylesheet" href="https://use.fontawesome.com/releases/
v5.8.2/css/all.css" integrity="sha384-
oS3vJWv+0UjzBfQzYUhtDYW+Pj2yciDJxpsK1OYPAYjqT085Qq/
1cq5FLXAZQ7Ay" crossorigin="anonymous">
```

```
k href="https://fonts.googleapis.com/css?
family=Advent+Pro&display=swap" rel="stylesheet">
<style type="text/css">
      .container{
           width: 40vw;
           margin-left: 30vw;
           margin-top: 15vh;
  h1{
   font-size: 28px;
   position: absolute;
   top: 10vh;
   left:5vw;
   border-left: 2px solid gray;
   padding-left: 5px;
</style>
</head>
<body>
<!-- Image and text -->
<nav class="navbar navbar-dark bg-dark">
 <a class="navbar-brand" href="#">
  <i class="fas fa-laptop-code"></i>
   Verification & Validation
 </a>
</nav>
<h1>System 2</h1>
<form action="/system2/msglen2" method="get">
<div class="container">
<div class="form-group">
  <label >Message Length/label>
  <input type="text" class="form-control" id="msglen" >
 </div>
```

```
<button type="submit" class="btn btn-outline-primary" id="send">select/
button>
</div>
</form>
<script src="ws_second.js"></script>
</body>
</html>
ws_second.js
var socket = io.connect('http://localhost:3000');
var msg = document.getElementByld('msglen'),
btn = document.getElementById('send');
socket.on('chat', function(data){
msg.value = data.message;
});
Database Schemas
db_ml2.js
var mongoose = require("mongoose");
var ml2 = new mongoose.Schema({
     name:String,
     roll:String,
     date:{type:Date,default:Date.now}
});
module.exports=mongoose.model("db_ml2",ml2);
```

package.json

```
{
  "name": "internship",
  "version": "1.0.0",
  "description": "",
  "main": "app.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "author": "Sri Chanakya Yennana",
  "license": "ISC",
  "dependencies": {
    "body-parser": "^1.19.0",
    "ejs": "^2.6.1",
    "express": "^4.17.1",
    "mongoose": "^5.5.11",
    "socket.io": "^2.2.0"
  }
}
```