



Name : Ujjawal kumar

College roll no. :20201441

Exam roll no. :20020570038

Subject : Internet Technology

Course : BSc. (H) Computer Science

Semester : 5th Sem, 3rd Year

Submitted to :Kamlesh Raghuvanshi Sir

Date :10th November,2022

(Ramanujan College)

Ques1:

Display your systems IP Address, Subnet mask using ipconfig, and find out the network address and the maximum number of systems possible on your network and range of IP addresses available to these systems.

```
HP@LAPTOP-JEL6DNS6 MINGW64 ~
$ ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 2:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 3:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:
  Connection-specific DNS Suffix . :
  IPv6 Address. . . . . : 2409:4064:2392:ec09:b966:b2fa:c4f7:8b07
  Temporary IPv6 Address. . . . . : 2409:4064:2392:ec09:c6c:2a84:1c53:12f2
  Link-Local IPv6 Address . . . . . : fe80::b966:b2fa:c4f7:8b07%8
  IPv4 Address. . . . . : 192.168.43.165
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : fe80::bc91:b5ff:fe96:f0cd%8
                                         192.168.43.172

Ethernet adapter Bluetooth Network Connection:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . :
```

- **System IP Address: 192.168.43.165**
- **Subnet mask: 255.255.255.0**
- **Network ID: 192.168.43.0**
- **Broadcast ID: 192.168.43.255**
- **Maximum number of system possible on the network: 254**
- **Range of IP addresses: 192.168.43.0 to 192.168.43.255**
- **Class type: C**

Ques 2:

With help of ping, check if you are connected to other systems of your network and find the route to connect to that system using tracert . List all the processes which are using ports for TCP protocol.

```
HP@LAPTOP-JEL6DNS6 MINGW64 ~
$ ping google.com

Pinging google.com [2404:6800:4009:82f::200e] with 32 bytes of data:
Reply from 2404:6800:4009:82f::200e: time=112ms
Reply from 2404:6800:4009:82f::200e: time=108ms
Reply from 2404:6800:4009:82f::200e: time=116ms
Reply from 2404:6800:4009:82f::200e: time=113ms

Ping statistics for 2404:6800:4009:82f::200e:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 108ms, Maximum = 116ms, Average = 112ms
```

```
HP@LAPTOP-JEL6DNS6 MINGW64 ~
$ tracert google.com

Tracing route to google.com [2404:6800:4009:82f::200e]
over a maximum of 30 hops:

 1  22 ms   19 ms   4 ms  2409:4064:38f:8784::a0
 2  *          *          * Request timed out.
 3  60 ms   60 ms   60 ms  2405:200:313:1501::2
 4  81 ms   60 ms   56 ms  2405:200:801:1000::1e7d
 5  101 ms   60 ms   80 ms  2405:200:801:1000::1e3b
 6  *          79 ms   *          2405:200:801:500::1d
 7  79 ms   79 ms   79 ms  2001:4860:1:1::1a35
 8  92 ms   71 ms   87 ms  2001:4860:1:1::1a34
 9  96 ms   79 ms   79 ms  2404:6800:811f::1
10  *          *          * Request timed out.
11  163 ms   99 ms   87 ms  2001:4860:0:9e::3
12  *          *          * Request timed out.
13  135 ms   119 ms  118 ms  2001:4860::9:4001:7734
14  128 ms   107 ms  91 ms  2001:4860:0:115b::1
15  116 ms   83 ms   92 ms  2001:4860:0:1::3ff
16  *          *          * Request timed out.
17  123 ms   87 ms   95 ms  bom12s19-in-x0e.1e100.net [2404:6800:4009:82f::200e]
```

```

Trace complete.

HP@LAPTOP-JEL6DNS6 MINGW64 ~
$ netstat -r
=====
Interface List
  3...c8 d9 d2 ee ee 5f ....Realtek PCIe Gbe Family Controller
  11...d2 c5 d3 3c b9 b7 ....Microsoft Wi-Fi Direct Virtual Adapter
  4...d0 c5 d3 3c b9 b7 ....Microsoft Wi-Fi Direct Virtual Adapter #2
  8...d0 c5 d3 3c b9 b7 ....Realtek RTL8723DE 802.11b/g/n PCIe Adapter
  1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination      Netmask     Gateway       Interface Metric
          0.0.0.0        0.0.0.0   192.168.43.239  192.168.43.20    55
          127.0.0.0      255.0.0.0   On-link        127.0.0.1    331
          127.0.0.1      255.255.255.255  On-link        127.0.0.1    331
  127.255.255.255      255.255.255.255  On-link        127.0.0.1    331
          192.168.43.0    255.255.255.0   On-link      192.168.43.20    311
          192.168.43.20    255.255.255.255  On-link      192.168.43.20    311
          192.168.43.255   255.255.255.255  On-link      192.168.43.20    311
          192.168.137.0    255.255.255.0   On-link      192.168.137.1   281
          192.168.137.1    255.255.255.255  On-link      192.168.137.1   281
  192.168.137.255      255.255.255.255  On-link      192.168.137.1   281
          224.0.0.0        240.0.0.0   On-link        127.0.0.1    331
          224.0.0.0        240.0.0.0   On-link      192.168.43.20    311
          224.0.0.0        240.0.0.0   On-link      192.168.137.1   281
  255.255.255.255      255.255.255.255  On-link        127.0.0.1    331
  255.255.255.255      255.255.255.255  On-link      192.168.43.20    311
  255.255.255.255      255.255.255.255  On-link      192.168.137.1   281
=====

Persistent Routes:
  None

```

```

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
  8    71 ::/0                      fe80::6041:faff:feec:7670
  1    331 ::1/128                 On-link
  8    71 2409:4064:38f:8784::/64  On-link
  8    311 2409:4064:38f:8784:b966:b2fa:c4f7:8b07/128
                                         On-link
  8    311 2409:4064:38f:8784:e494:50a3:157a:b54a/128
                                         On-link
  8    311 fe80::/64                On-link
  4    281 fe80::/64                On-link
  4    281 fe80::a11b:ef56:19e2:6d68/128
                                         On-link
  8    311 fe80::b966:b2fa:c4f7:8b07/128
                                         On-link
  1    331 ff00::/8                On-link
  8    311 ff00::/8                On-link
  4    281 ff00::/8                On-link
=====

Persistent Routes:
  None

```

```

HP@LAPTOP-JEL6DNS6 MINGW64 ~
$ netstat -a

Active Connections

          Proto  Local Address          Foreign Address        State
    TCP    0.0.0.0:135           LAPTOP-JEL6DNS6:0      LISTENING
    TCP    0.0.0.0:445           LAPTOP-JEL6DNS6:0      LISTENING
    TCP    0.0.0.0:5040          LAPTOP-JEL6DNS6:0      LISTENING
    TCP    0.0.0.0:7250          LAPTOP-JEL6DNS6:0      LISTENING
    TCP    0.0.0.0:7680          LAPTOP-JEL6DNS6:0      LISTENING
    TCP    0.0.0.0:49664          LAPTOP-JEL6DNS6:0      LISTENING
    TCP    0.0.0.0:49665          LAPTOP-JEL6DNS6:0      LISTENING
    TCP    0.0.0.0:49666          LAPTOP-JEL6DNS6:0      LISTENING
    TCP    0.0.0.0:49667          LAPTOP-JEL6DNS6:0      LISTENING
    TCP    0.0.0.0:49668          LAPTOP-JEL6DNS6:0      LISTENING
    TCP    0.0.0.0:49669          LAPTOP-JEL6DNS6:0      LISTENING
    TCP    127.0.0.1:58685         login:58686       ESTABLISHED
    TCP    127.0.0.1:58686         login:58685       ESTABLISHED
    TCP    127.0.0.1:58694         login:58695       ESTABLISHED
    TCP    127.0.0.1:58695         login:58694       ESTABLISHED
    TCP    127.0.0.1:58697         login:58698       ESTABLISHED
    TCP    127.0.0.1:58698         login:58697       ESTABLISHED
    TCP    127.0.0.1:58702         login:58703       ESTABLISHED
    TCP    127.0.0.1:58703         login:58702       ESTABLISHED
    TCP    127.0.0.1:59505         login:59506       ESTABLISHED
    TCP    127.0.0.1:59506         login:59505       ESTABLISHED
    TCP    127.0.0.1:59845         login:59846       ESTABLISHED
    TCP    127.0.0.1:59846         login:59845       ESTABLISHED
    TCP    127.0.0.1:59871         login:59872       ESTABLISHED
    TCP    127.0.0.1:59872         login:59871       ESTABLISHED
    TCP    192.168.43.20:139        LAPTOP-JEL6DNS6:0      LISTENING

```

```

TCP  192.168.43.20:139      LAPTOP-JEL6DNS6:0      LISTENING
TCP  192.168.43.20:58717     ec2-52-38-188-32:https  ESTABLISHED
TCP  192.168.43.20:59288     ns3036908:3333      ESTABLISHED
TCP  192.168.43.20:60003     20.198.162.78:https  ESTABLISHED
TCP  192.168.43.20:60004     52.114.14.208:https  ESTABLISHED
TCP  192.168.43.20:60063     239:https            TIME_WAIT
TCP  192.168.43.20:60064     52.114.16.138:https  ESTABLISHED
TCP  192.168.137.1:139       LAPTOP-JEL6DNS6:0      LISTENING
TCP  [::]:135                LAPTOP-JEL6DNS6:0      LISTENING
TCP  [::]:445                LAPTOP-JEL6DNS6:0      LISTENING
TCP  [::]:7250               LAPTOP-JEL6DNS6:0      LISTENING
TCP  [::]:7680               LAPTOP-JEL6DNS6:0      LISTENING
TCP  [::]:49664              LAPTOP-JEL6DNS6:0      LISTENING
TCP  [::]:49665              LAPTOP-JEL6DNS6:0      LISTENING
TCP  [::]:49666              LAPTOP-JEL6DNS6:0      LISTENING
TCP  [::]:49667              LAPTOP-JEL6DNS6:0      LISTENING
TCP  [::]:49668              LAPTOP-JEL6DNS6:0      LISTENING
TCP  [::]:49669              LAPTOP-JEL6DNS6:0      LISTENING
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:59439  [2405:200:1630:8bf::57]:https  CLOSE_WAIT
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60034  whatsapp-cdn6-shv-01-de11:https  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60054  [2603:1040:f02:6::15]:https  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60073  [2603:1046:c01:1000::2]:https  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60074  [2606:2800:147:120f:30c:1ba0:fc6:265a]:https  CLOSE_WAIT
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60075  [2606:2800:147:120f:30c:1ba0:fc6:265a]:https  CLOSE_WAIT
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60077  de11s09-in-x0e:https  TIME_WAIT
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60080  [2405:200:1630:a0::312c:c358]:https  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60081  [2405:200:1630:a0::312c:c358]:https  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60082  [2405:200:1630:a0::312c:c358]:https  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60083  [2405:200:1630:a0::312c:c358]:https  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60084  [2405:200:1630:a0::312c:c358]:https  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60085  [2405:200:1630:a0::312c:c358]:https  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60092  bom0s15-in-x16:https  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60093  de10s14-in-x03:http  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60094  bom12s05-in-x0e:https  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60096  [2405:200:1630:ff95:face:b00c:3333:7020]:https  ESTABLISHED
TCP  [2409:4064:38f:8784:e494:50a3:157a:b54a]:60097  [2405:200:1630:ff87:face:b00c:3333:7020]:https  ESTABLISHED

```

```
      UDP  0.0.0.0:5050          *:*  
      UDP  0.0.0.0:5353          *:  
      UDP  0.0.0.0:5355          *:  
      UDP  0.0.0.0:56346         *:  
      UDP  0.0.0.0:59762         *:  
      UDP  127.0.0.1:1900        *:  
      UDP  127.0.0.1:49664        *:  
      UDP  127.0.0.1:60617        *:  
      UDP  192.168.43.20:137       *:  
      UDP  192.168.43.20:138       *:  
      UDP  192.168.43.20:1900       *:  
      UDP  192.168.43.20:60616       *:  
      UDP  192.168.137.1:67        *:  
      UDP  192.168.137.1:68        *:  
      UDP  192.168.137.1:137       *:  
      UDP  192.168.137.1:138       *:  
      UDP  192.168.137.1:1900       *:  
      UDP  192.168.137.1:60615       *:  
      UDP  [::]:5353          *:  
      UDP  [::]:5355          *:  
      UDP  [::]:50094          *:  
      UDP  [::]:56346          *:  
      UDP  [::]:59762          *:  
      UDP  [::1]:1900          *:  
      UDP  [::1]:60614          *:  
      UDP  [fe80::a11b:ef56:19e2:6d68%4]:1900  *:  
      UDP  [fe80::a11b:ef56:19e2:6d68%4]:60612  *:  
      UDP  [fe80::b966:b2fa:c4f7:8b07%8]:1900  *:  
      UDP  [fe80::b966:b2fa:c4f7:8b07%8]:60613  *
```

```
HP@LAPTOP-JEL6DNS6 MINGW64 ~  
$ ping 25.56.227.210  
  
Pinging 25.56.227.210 with 32 bytes of data:  
Reply from 25.56.227.210: bytes=32 time=2ms TTL=64  
Reply from 25.56.227.210: bytes=32 time=2ms TTL=64  
Reply from 25.56.227.210: bytes=32 time=2ms TTL=64  
Reply from 25.56.227.210: bytes=32 time=3ms TTL=64  
  
Ping statistics for 25.56.227.210:  
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
    Minimum = 2ms, Maximum = 3ms, Average = 2ms  
  
HP@LAPTOP-JEL6DNS6 MINGW64 ~  
$ tracert 25.56.227.210  
  
Tracing route to 25.56.227.210 over a maximum of 30 hops  
  1      5 ms      5 ms      4 ms  25.56.227.210  
  
Trace complete.
```

```

HP@LAPTOP-JEL6DNS6 MINGW64 ~
$ ping 192.168.43.19

Pinging 192.168.43.19 with 32 bytes of data:
Reply from 192.168.43.19: bytes=32 time=28ms TTL=64
Reply from 192.168.43.19: bytes=32 time=4ms TTL=64
Reply from 192.168.43.19: bytes=32 time=63ms TTL=64
Reply from 192.168.43.19: bytes=32 time=9ms TTL=64

Ping statistics for 192.168.43.19:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 4ms, Maximum = 63ms, Average = 26ms

HP@LAPTOP-JEL6DNS6 MINGW64 ~
$ tracert 192.168.43.19

Tracing route to 192.168.43.19 over a maximum of 30 hops
  1      4 ms      5 ms      6 ms  192.168.43.19

Trace complete.

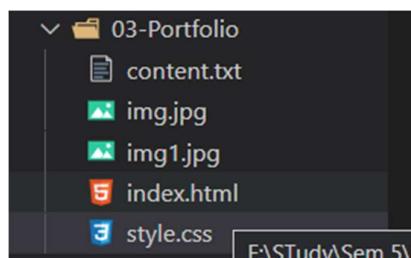
```

Ques 3:

Create an HTML page that shows information about you, your course, hobbies, address, and your plans. Use CSS for styling of HTML page so that looks nice.

Code:

Format



HTML

```

<!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" />
    <link rel="stylesheet" href="style.css" />

```

```

        <title>Ujjawal Kumar</title>
    </head>
    <body>
        <header class="main-header">
            
            <div class="sub-header">
                <h1 class="name">Ujjawal Kumar</h1>
                <h2 class="description">
                    Self-learning Front End Developer,<br />
                    School-taught C++ Programmer
                </h2>
            </div>
            <nav class="nav-bar">
                <a href="https://twitter.com/Ujjawalkumarr">Twitter</a>
                <a href="https://github.com/Ujjawalkumarr">Github</a>
                <a href="https://codepen.io/Ujjawalkumar">Codepen</a>
                <a href="#">LinkedIn</a>
            </nav>
        </header>

        <div class="container">
            <div class="sub-container">
                <div class="section-one">
                    <h3>Hello, I'm Ujjawal Kumar </h3>
                    <p>
                        I'm school-taught C++ Programmer & self-learning Front End
                    Developer
                        based in India. For now, I freelance and build projects for fun. I
                        build websites with a focus on responsive design, accessibility and
                        pleasing aesthetics. I'm pursuing BSc (Hons) Computer Science from
                        Delhi University.
                    </p>
                </div>
                <div class="section-two">
                    <h3 class="things-can-do">
                        I constantly try to learn new technologies and concepts but here
                    are
                        the things I can do right now:
                    </h3>
                    <ul>
                        <li>HTML</li>

```

```

        <li>CSS</li>
        <li>C++</li>
        <li>DBMS</li>
        <li>JAVA</li>
        <li>PYTHON</li>
        <li>Read books</li>
        <li>Drink much tea/coffee</li>
    </ul>
</div>
</div>

<aside class="section-three">
    <h3>More about me:</h3>
    <p>
        I first started coding sometime in 2018 when I took Computer Science
        in 11th standard in school. The very first language I learnt was C++
        and from then, I was hooked. I knew I enjoyed figuring out the logic
        behind applications but recently I became more interested in
        learning
        how to make it pretty for the users.
    </p>

    <p>
        I'm trying to achieve my beginner level developer status. I'm also
        looking for internships or freelance work under well guidance to gain
        work experience.
    </p>

    <p>Thank for reading ☺</p>
</aside>
</div>

<h3>Contact ☎</h3>
<p>Tell me about your job opportunity or just say hi :)</p>

<!-- FORM -->
<div class="contact">
    <form action="#" class="form">
        <input type="text" class="form-name" placeholder="Name:" />
        <input type="email" class="e-mail" placeholder="E--mail:" />
        <input type="text" class="subject" placeholder="Subject (optional):">
    />
        <textarea class="message" placeholder="Message:"></textarea>
        <button class="submit-button">Submit</button>
    </form>

    <p class="address">
        You can also write to me at: <br />

```

```

Y-580/10, prem nagar 2, <br />
kirari suleman nagar, <br />
near durga chowk, <br />
North-West Delhi, <br />
Delhi-110006
</p>
</div>

<footer class="footer">
    &copy; build & designed by Ujjawal Kumar &hearts;
</footer>
</body>
</html>

```

CSS

```

* {
    margin: 0;
    padding: 0;
    box-sizing: border-box;
}

body {
    font-family: sans-serif;
    background-color: #eaddca;
    line-height: 1.3;
    width: 1200px;
    margin: 0 auto;
}

.name {
    color: #000;
    font-size: 16px;
    font-weight: normal;
    text-transform: uppercase;
}

.img {
    width: 125px;
    height: 125px;
    border-radius: 50%;
}

.main-header {
    display: flex;
    background-color: #c19a6b;
    align-items: center;
    justify-content: space-between;
}

```

```
    gap: 10px;
    padding: 20px;
    margin-bottom: 50px;
}

.section-three {
    border-top: 5px solid #c19a6b;
    border-bottom: 5px solid #c19a6b;
    padding: 50px 40px;
    background-color: bisque;
}

.container {
    display: flex;
    align-items: flex-start;
    justify-content: space-between;
    gap: 75px;
    margin-bottom: 50px;
}

.sub-container {
    flex: 1;
}

.section-three {
    flex: 0 0 400px;
}

h2 {
    color: #5c4033;
    font-size: 28px;
    margin-bottom: 10px;
}

h3 {
    color: #8b4513;
    font-size: 22px;
    margin-bottom: 5px;
}

p {
    margin-bottom: 20px;
}

nav a:link {
    text-decoration: none;
    color: #000;
    text-transform: uppercase;
```

```
    font-size: 12px;
    margin-right: 20px;
}

nav a:visited {
    color: #000;
}

nav a:hover {
    color: #fff;
}

nav a:active {
    background-color: #000;
    color: #a0522d;
}

nav a:link:last-child {
    margin-right: 0;
}

li {
    list-style: none;
}

ul {
    display: grid;
    grid-template-columns: 1fr 1fr;
    column-gap: 10px;
    row-gap: 10px;
    padding: 50px;
}

.form {
    display: grid;
    grid-template-columns: 1fr;
    row-gap: 10px;
    align-items: center;
    justify-items: flex-start;
    margin-bottom: 50px;
    flex: 0;
}

.form-name {
    width: 200px;
    height: 30px;
}
```

```
.e-mail {
    width: 200px;
    height: 30px;
}

.subject {
    width: 200px;
    height: 30px;
}

.message {
    width: 250px;
    height: 200px;
}

.submit-button {
    text-transform: uppercase;
    color: #fff;
    background-color: #000;
    border: 0;
    padding: 10px;
    font-size: 16px;
    letter-spacing: 2px;
}

.submit-button:hover {
    color: #000;
    background-color: #eaddca;
    border: 2px solid #000;
    cursor: pointer;
}

.address {
    border: 5px solid #c19a6b;
    display: inline-block;
    padding: 20px;
    flex: 0 0 300px;
    align-self: flex-start;
    margin-top: 30px;
}

.contact {
    display: flex;
    gap: 150px;
}

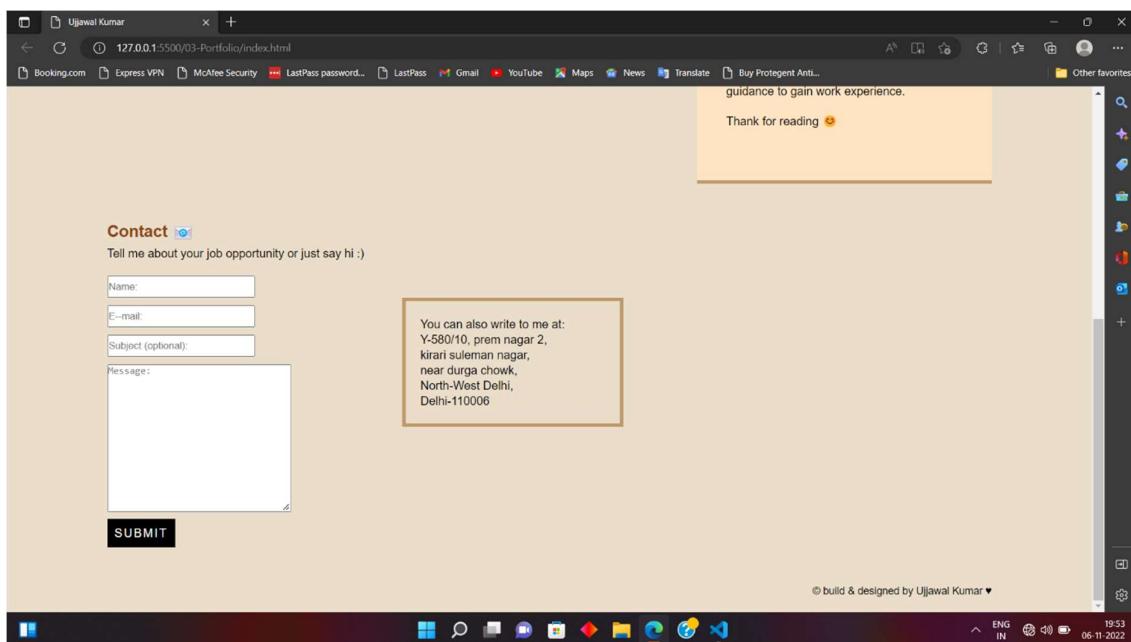
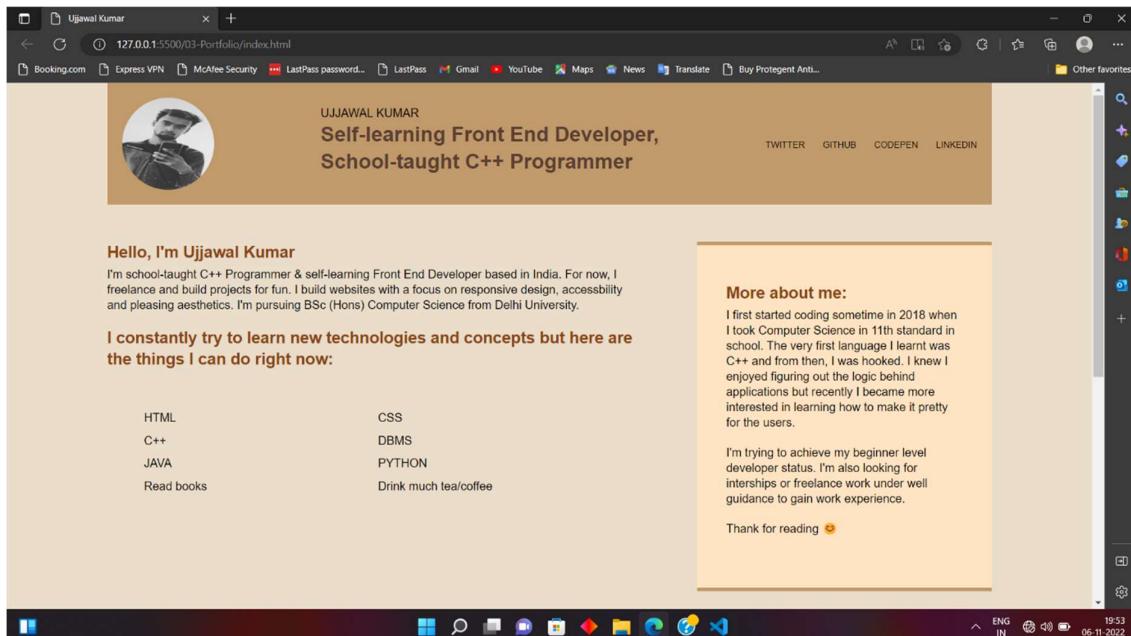
.footer {
    font-size: 14px;
```

```

    text-align: right;
    margin-bottom: 20px;
}

```

Output:

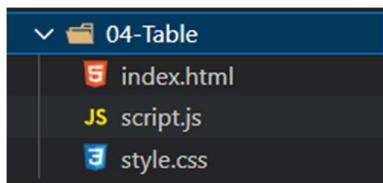


Ques 4:

Create an HTML page with the sole purpose to show multiplication tables of 2 to 10 (row-wise) created by JavaScript. Initially, the page is blank. With help of set Interval function print a row every 5 seconds in different colors and increasing font size.

Code:

Format



HTML

```
<!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>Table</title>
    <link rel="stylesheet" href="style.css" />
    <script defer src="script.js"></script>
  </head>
  <body>
    <div class="container">
      <table class="table"></table>
    </div>
  </body>
</html>
```

CSS

```
* {
  margin: 0;
  padding: 0;
  box-sizing: border-box;
}
```

```
body {
    font-family: sans-serif;
}

.container {
    display: flex;
    justify-content: center;
    max-width: 1400px;
    margin: 48px auto;
}

.table {
    width: 1200px;
    border-collapse: collapse;
    font-weight: 600;
    color: #fff;
}

.table td {
    width: 10%;
    padding: 16px 32px;
    text-align: left;
}

.row-1 {
    font-size: 16px;
    background-color: #fa5252;
}

.row-2 {
    font-size: 18px;
    background-color: #e64980;
}

.row-3 {
    font-size: 20px;
    background-color: #be4bdb;
}

.row-4 {
    font-size: 22px;
    background-color: #7950f2;
}

.row-5 {
    font-size: 24px;
    background-color: #4c6ef5;
}
```

```

.row-6 {
  font-size: 28px;
  background-color: #228be6;
}

.row-7 {
  font-size: 32px;
  background-color: #15aabf;
}

.row-8 {
  font-size: 36px;
  background-color: #12b886;
}

.row-9 {
  font-size: 48px;
  background-color: #40c057;
}

```

JavaScript

```

console.log("hello");
const tableEl = document.querySelector(".table");
var num = 2;
var className = "row-1";
function mulTable() {
  const arr = new Array();
  for (let i = 1; i <= 10; i++) {
    arr.push(num * i);
  }
  var newRow = document.createElement("tr");
  for (let i = 0; i < 10; i++) {
    var newData = document.createElement("td");
    newData.appendChild(document.createTextNode(arr[i]));
    newRow.appendChild(newData);
  }
  newRow.classList.add(className);
  tableEl.appendChild(newRow);

  num = num + 1;
  let row = num - 1;
  className = "row-" + row;
}

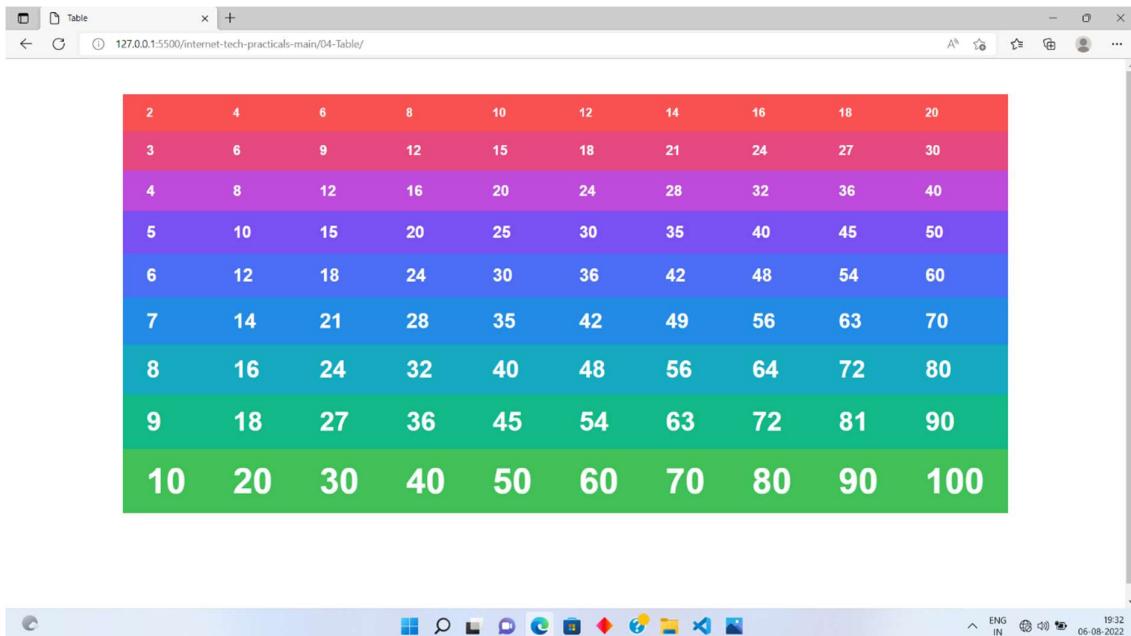
```

```

const intervalId = window.setInterval(mulTable, 5000);
const lastRow = document.querySelector(".row-9");
if (lastRow != null) {
  clearInterval(intervalId);
}

```

Output



A screenshot of a web browser displaying a 10x10 multiplication table. The table is color-coded by row: Row 1 (2) is orange, Row 2 (3) is purple, Row 3 (4) is pink, Row 4 (5) is light blue, Row 5 (6) is teal, Row 6 (7) is dark blue, Row 7 (8) is green, Row 8 (9) is red, and Row 9 (10) is yellow. The numbers in the table range from 2 to 100.

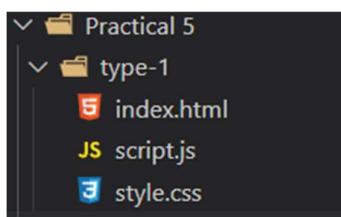
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100

Ques 5:

Create an HTML page with a paragraph written on it and under which 9 buttons are placed in a 3X3 grid. The first row is for buttons labeled with colors names Red, Green, and Blue, the second row with numbers 10, 20, 30, and the third row with different font names. Click event of each of the buttons should make the appropriate change in the style of paragraph.

Code:

Format



HTML

```
<!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>Style Paragraph</title>
    <link rel="stylesheet" href="style.css" />
    <script defer src="script.js"></script>
  </head>
  <body>
    <h1>Click the buttons below to style the paragraph.</h1>
    <p class="paragraph">
      Lorem ipsum dolor sit amet consectetur adipisicing elit. Sit eos
      mollitia
      expedita sint quidem id, ut hic eum, asperiores amet quaerat autem quasi
      unde sequi molestias itaque atque explicabo assumenda! Lorem ipsum dolor
      sit, amet consectetur adipisicing elit. Velit sed, et eum enim a odit
      ullam quo in nesciunt consequatur reiciendis tempora minima quasi
      laborum,
      recusandae laudantium, consectetur libero mollitia. Lorem ipsum dolor
      sit,
      amet consectetur adipisicing elit. Commodi magnam quas aperiam fuga
      illum,
      molestias adipisci deserunt voluptatibus doloribus aliquid. Illo quia
      sit
      necessitatibus deleniti saepe possimus cum preferendis earum?
    </p>

    <div class="container">
      <button class="el el--1">Red</button>
      <button class="el el--2">Green</button>
      <button class="el el--3">Blue</button>
      <button class="el el--4">10</button>
      <button class="el el--5">20</button>
      <button class="el el--6">30</button>
      <button class="el el--7">Sans-serif</button>
      <button class="el el--8">Cursive</button>
      <button class="el el--9">Monospace</button>
    </div>
  </body>
</html>
```

CSS

```
* {
    margin: 0;
    padding: 0;
    box-sizing: border-box;
}

html {
    font-size: 62.5%;
}

body {
    background-color: #f7f7f7;
    width: 120rem;
    margin: 0 auto;
}

h1 {
    font-family: sans-serif;
    font-weight: normal;
    color: palevioletred;
    font-size: 28px;
    width: 700px;
    margin: 40px auto;
    text-align: center;
}

.paragraph {
    border: 3px solid #228b22;
    padding: 20px;
    font-size: 18px;
    margin: 40px auto;
    font-family: serif;
}

.container {
    display: grid;
    grid-template-columns: 1fr 1fr 1fr;
    /* grid-template-rows: 1fr 1fr 1fr; */
    gap: 20px;
    padding: 40px 50px;
}

.el {
    cursor: pointer;
    font-family: sans-serif;
    padding: 1.6rem 3.2rem;
```

```
    text-transform: uppercase;
    font-weight: bold;
    background-color: #333;
    color: #f7f7f7;
    border: none;
    transition: all 0.4s;
    font-size: 1.8rem;
}

.el:focus {
    box-shadow: 0 0 0 0.8rem rgba(217, 119, 242, 0.877);
}

.el--1:hover {
    background-color: #f03e3e;
}

.el--2:hover {
    background-color: #37b24d;
}

.el--3:hover {
    background-color: #1c7ed6;
}

.el--4:hover {
    background-color: #222;
}

.el--5:hover {
    background-color: #222;
}

.el--6:hover {
    background-color: #222;
}

.el--7:hover {
    background-color: #223;
}

.el--8:hover {
    background-color: #222;
}

.el--9:hover {
    background-color: #222;
}
```

```

.red-text {
  color: #f03e3e;
}

.green-text {
  color: #37b24d;
}

.blue-text {
  color: #1c7ed6;
}

.small-text {
  font-size: 10px;
}

.md-text {
  font-size: 20px;
}

.large-text {
  font-size: 30px;
}

.sans-serif-text {
  font-family: sans-serif;
}

.cursive-text {
  font-family: cursive;
}

.monospace-text {
  font-family: monospace;
}

```

JavaScript

```

const btnRed = document.querySelector(".el--1");
btnRed.addEventListener("click", function () {
  var textEl = document.querySelector(".paragraph");
  console.log(textEl.textContent);
  if (textEl.classList.contains("green-text")) {
    textEl.classList.remove("green-text");
  }
}

```

```

if (textEl.classList.contains("blue-text")) {
    textEl.classList.remove("blue-text");
}

textEl.classList.add("red-text");
});

const btnGreen = document.querySelector(".el--2");
btnGreen.addEventListener("click", function () {
    var textEl = document.querySelector(".paragraph");
    console.log(textEl.textContent);
    if (textEl.classList.contains("red-text")) {
        textEl.classList.remove("red-text");
    }

    if (textEl.classList.contains("blue-text")) {
        textEl.classList.remove("blue-text");
    }

    textEl.classList.add("green-text");
});

const btnBlue = document.querySelector(".el--3");
btnBlue.addEventListener("click", function () {
    var textEl = document.querySelector(".paragraph");
    console.log(textEl.textContent);
    if (textEl.classList.contains("red-text")) {
        textEl.classList.remove("red-text");
    }

    if (textEl.classList.contains("green-text")) {
        textEl.classList.remove("green-text");
    }

    textEl.classList.add("blue-text");
});

const btn10 = document.querySelector(".el--4");
btn10.addEventListener("click", function () {
    var textEl = document.querySelector(".paragraph");
    console.log(textEl.textContent);
    if (textEl.classList.contains("md-text")) {
        textEl.classList.remove("md-text");
    }

    if (textEl.classList.contains("large-text")) {
        textEl.classList.remove("large-text");
    }
}

```

```
textEl.classList.add("small-text");
});

const btn20 = document.querySelector(".el--5");
btn20.addEventListener("click", function () {
  var textEl = document.querySelector(".paragraph");
  console.log(textEl.textContent);
  if (textEl.classList.contains("small-text")) {
    textEl.classList.remove("small-text");
  }

  if (textEl.classList.contains("large-text")) {
    textEl.classList.remove("large-text");
  }

  textEl.classList.add("md-text");
});

const btn30 = document.querySelector(".el--6");
btn30.addEventListener("click", function () {
  var textEl = document.querySelector(".paragraph");
  console.log(textEl.textContent);
  if (textEl.classList.contains("small-text")) {
    textEl.classList.remove("small-text");
  }

  if (textEl.classList.contains("md-text")) {
    textEl.classList.remove("md-text");
  }

  textEl.classList.add("large-text");
});

const btnSans = document.querySelector(".el--7");
btnSans.addEventListener("click", function () {
  var textEl = document.querySelector(".paragraph");
  console.log(textEl.textContent);
  if (textEl.classList.contains("cursive-text")) {
    textEl.classList.remove("cursive-text");
  }

  if (textEl.classList.contains("monospace-text")) {
    textEl.classList.remove("monospace-text");
  }

  textEl.classList.add("sans-serif-text");
});
```

```

const btnCursive = document.querySelector(".el--8");
btnCursive.addEventListener("click", function () {
  var textEl = document.querySelector(".paragraph");
  console.log(textEl.textContent);
  if (textEl.classList.contains("sans-serif-text")) {
    textEl.classList.remove("sans-serif-text");
  }

  if (textEl.classList.contains("monospace-text")) {
    textEl.classList.remove("monospace-text");
  }

  textEl.classList.add("cursive-text");
});

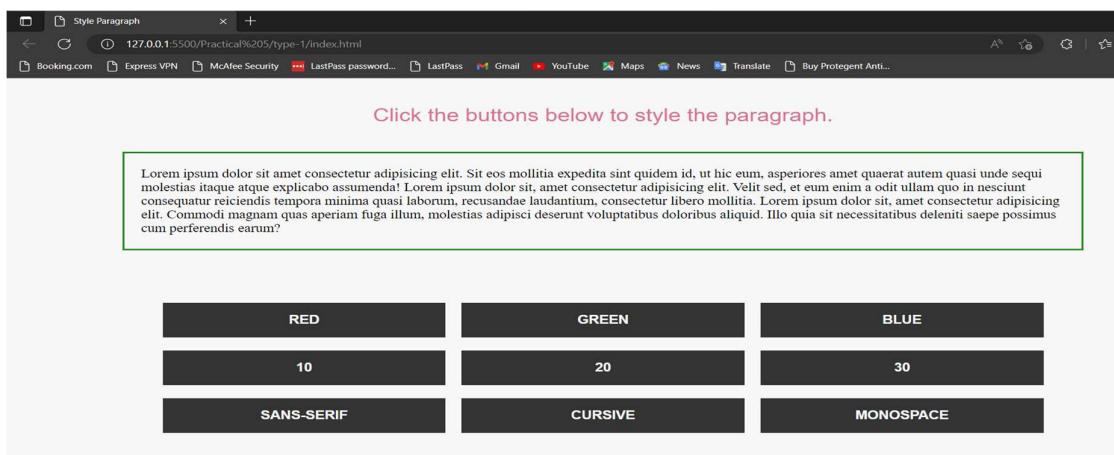
const btnMonospace = document.querySelector(".el--9");
btnMonospace.addEventListener("click", function () {
  var textEl = document.querySelector(".paragraph");
  console.log(textEl.textContent);
  if (textEl.classList.contains("sans-serif-text")) {
    textEl.classList.remove("sans-serif-text");
  }

  if (textEl.classList.contains("cursive-text")) {
    textEl.classList.remove("cursive-text");
  }

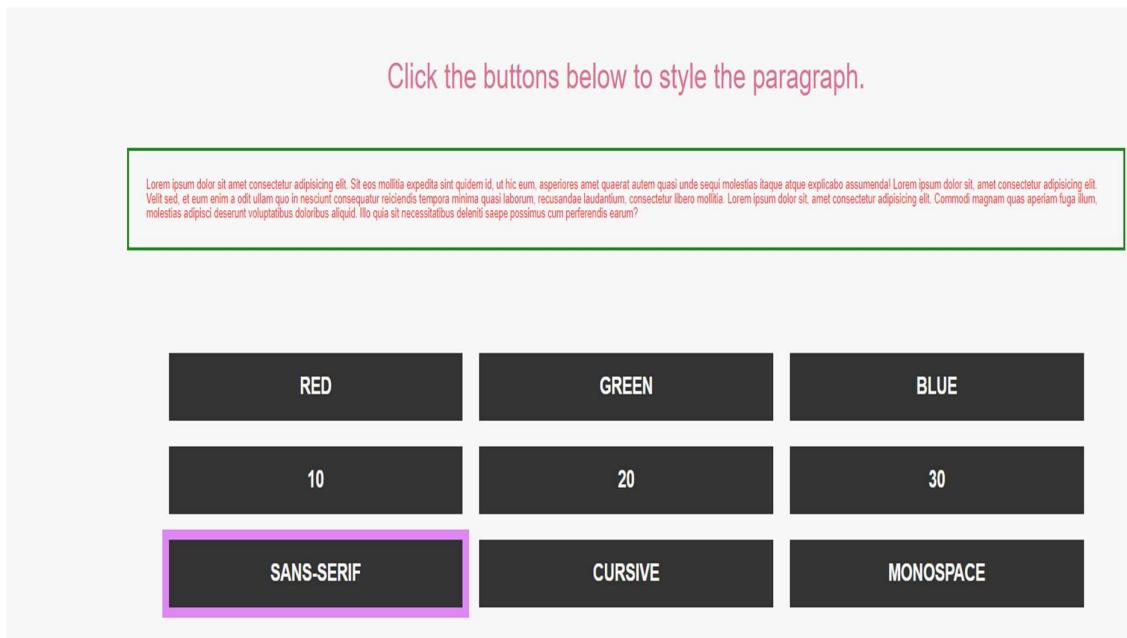
  textEl.classList.add("monospace-text");
});

```

Output (Original)



After

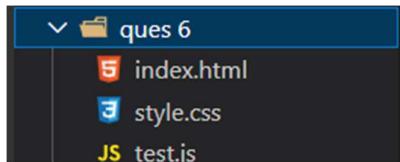


Ques 6:

Create a form that takes data about a pet. The form must be well designed and should accept the pet's name, age, weight, type, and what it likes most. At the submission of this form create a Pet object in JavaScript filled with these values and log that object and equivalent JSON on the console.

Code:

Format



HTML

```
<!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>Pet Form</title>
<link rel="stylesheet" href="style.css">

</head>

<body>

    <section class="contact-form">
        <div class="left-container">
            <h1>
                Pet Survey
            </h1>
            

        </div>

        <div class="container">
            <h1>Enter Your Pet Information</h1>
            <form id="contact-form">
                <div class="form-control">
                    <div class="field">
                        <label for="name">Name</label>
                        <input type="text" name="name" id="name"
placeholder="Enter your pet's name" required />
                    </div>
                    <div class="field">
                        <label for="age">Age</label>
                        <input type="number" step="0.1" name="age" id="age"
placeholder="Enter your pet's age" required />
                    </div>
                    <div class="field">
                        <label for="weight">Weight</label>
                        <input type="number" step="0.01" name="weight"
id="weight" placeholder="Enter your pet's weight"
required />
                    </div>
                    <div class="field">
                        <label for="type">Type</label>
                        <select name="type" id="type" required>
                            <option value="" disabled selected>Select your pet
type</option>
                            <option value="Dog">dog</option>
                            <option value="Cat">cat</option>
                            <option value="Bird">bird</option>
                            <option value="Rat">rat</option>
                            <option value="Other">Other</option>
                        </select>
                    </div>
                </div>
            </form>
        </div>
    </section>

```

```

                </select>
            </div>
            <div class="field">
                <label for="likes">Likes</label>
                <input type="text" name="likes" id="likes"
placeholder="Enter what your pet likes" required />
            </div>
        </div>

        <div class="form-control-2">
            <input id="male" name="gender" type="radio" value="Male"
/>
            <label class="inline" for="male">Male</label>

            <input id="female" name="gender" type="radio"
value="Female" />
            <label class="inline" for="female">Female</label>

            <input id="none" name="gender" type="radio" value="None"
/>
            <label class="inline" for="none">None</label>
        </div>

        <div class="form-control-2">
            <p class="group-label">Your favourite pets:</p>
            <input type="checkbox" name="favorite_pet" value="Cats"
/>Cats
            <input type="checkbox" name="favorite_pet" value="Dogs"
/>Dogs
            <input type="checkbox" name="favorite_pet" value="Birds"
/>Birds
            <input type="checkbox" name="favorite_pet"
value="Rats"/>Rats
        </div>

        <button class="btn" type="submit">Send</button>
    </form>
</div>
<div class="output">
    <h2>Form Data Output</h2>
    <pre class="output-pre"></pre>
</div>

<script src="test.js"></script>
</section>
</body>

```

```
</html>
```

CSS

```
* {
    box-sizing: border-box;
}

body {
    font-family: Arial, Helvetica, sans-serif;
    margin: 0;
    padding: 0;
    background-color: blueviolet;
}

.contact-form {
    display: flex;
    justify-content: center;
    align-items: center;
    height: 100vh;
    gap: 100px;
}

.container {
    background-color: #fff;
    padding: 40px 20px;
    border-radius: 5px;
    width: 400px;
    max-width: 100%;
    box-shadow: 0 0 10px 1px rgba(61, 61, 61, 0.19),
                0 0 15px 1px rgba(63, 63, 63, 0.23);
}

.form-control {
    margin-bottom: 10px;
    position: relative;
}

.form-control-2 {
    margin-bottom: 10px;
}

.form-control label {
    font-weight: bold;
    font-size: 13px;
}
```

```
.form-control input,  
.form-control select,  
.form-control textarea {  
    margin-top: 2px;  
    display: block;  
    width: 100%;  
    padding: 10px;  
    border-radius: 4px;  
    border: 2px solid blueviolet;  
    font-family: inherit;  
}  
  
.btn {  
    font-family: inherit;  
    width: 100%;  
    padding: 10px;  
    background-color: blueviolet;  
    color: #fff;  
    font-size: 15px;  
    border-radius: 4px;  
    border: 2px solid blueviolet;  
    cursor: pointer;  
    transition: all 0.5s ease-in-out;  
}  
  
.btn:focus {  
    outline: none;  
}  
  
.btn:hover {  
    color: blueviolet;  
    border: 2px solid blueviolet;  
    background: transparent;  
}  
  
.output {  
    background-color: rgba(255, 255, 255, 0.136);  
    padding: 40px 20px;  
    border-radius: 5px;  
    color: #fff;  
}
```

JavaScript

```
const form = document.getElementById("contact-form");  
  
form.addEventListener("submit", (e) => {
```

```

e.preventDefault();

const myFormData = new FormData(e.target);

const formDataObj = Object.fromEntries(myFormData.entries());

formDataObj.favorite_pet = myFormData.getAll("favorite_pet");
console.log(formDataObj);

// output data
const output = document.querySelector(".output-pre");
output.innerText = JSON.stringify(formDataObj, null, 2);
});

```

Output

Pet Survey



Enter Your Pet Information

Name
tommy

Age
2.5

Weight
7

Type
dog

Likes
Bones

Male Female None

Your favourite pets:

Cats Dogs Birds Rats

Send

Form Data Output

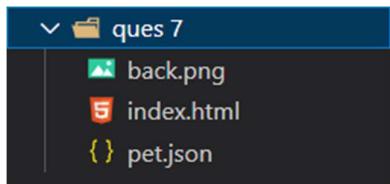
```
{
  "name": "tommy",
  "age": "2.5",
  "weight": "7",
  "type": "Dog",
  "likes": "Bones",
  "gender": "Male",
  "favorite_pet": [
    "Cats",
    "Dogs"
  ]
}
```

Ques 7:

Store JSON data of few pets that you created in previous practical in a JSON file (copy from console output of previous program to a .json file). Using AJAX, load data from the file and display it in a presentable way using HTML and CSS.

Code:

Format



HTML

```
<html lang="en">

<head>
    <meta charset="UTF-8">
    <title>Pet Details</title>

    <!-- INCLUDING JQUERY-->
    <script src=
"https://code.jquery.com/jquery-3.5.1.js">
    </script>

    <!-- CSS FOR STYLING THE PAGE -->
    <style>
        body {
            font-family: Arial, Helvetica, sans-serif;
            margin: 0;
            padding: 0;
            background-color: rgb(163, 158, 161);
            /* background-image:url('back.png');
            background-repeat: no-repeat;
            background-attachment: fixed;
            background-size: cover; */
        }
        table {
            margin: 0 auto;
            font-size: large;
            border: 1px solid black;
        }
    </style>
</head>
<body>
    <h1>Pet Details</h1>
    <table border="1">
        <thead>
            <tr>
                <th>Pet ID</th>
                <th>Name</th>
                <th>Type</th>
            </tr>
        </thead>
        <tbody>
            <tr>
                <td>1</td>
                <td>Buddy</td>
                <td>Dog</td>
            </tr>
            <tr>
                <td>2</td>
                <td>Lucky</td>
                <td>Cat</td>
            </tr>
            <tr>
                <td>3</td>
                <td>Fluffy</td>
                <td>Cat</td>
            </tr>
        </tbody>
    </table>
</body>
</html>
```

```

        }

h1 {
    text-align: center;
    color: #fefefe;
    font-size: xx-large;
    font-family: 'Gill Sans',
        'Gill Sans MT', ' Calibri',
        'Trebuchet MS', 'sans-serif';
}

td {

    background-color: #E4F5D4;
    border: 1px solid black;
}

th{
    font-weight: bold;
    background-color: rgb(255, 0, 76);
    border: 1px solid black;
    padding: 20px;
    text-align: center;
}

td {
    font-weight: bold;
    border: 1px solid black;
    padding: 20px;
    text-align: center;
}

td {
    font-weight: lighter;
}

```

</style>

</head>

<body>

<section>

<h1>Pet Survey Info Display</h1>

<!-- TABLE CONSTRUCTION-->

<table id='table'>

<!-- HEADING FORMATION -->

<tr>

<th>Pet Name</th>

```

<th>Age</th>
<th>Weight</th>
<th>Type</th>
<th>Likes</th>
<th>Gender</th>
<th>Favourite_Pet</th>
</tr>

<script>
$(document).ready(function () {

    // FETCHING DATA FROM JSON FILE
    $.getJSON("pet.json",
        function (data) {
            var Pet = '';

            // ITERATING THROUGH OBJECTS
            $.each(data, function (key, value) {

                //CONSTRUCTION OF ROWS HAVING
                // DATA FROM JSON OBJECT
                Pet += '<tr>';
                Pet += '<td>' +
                    value.name + '</td>';

                Pet += '<td>' +
                    value.age + '</td>';

                Pet += '<td>' +
                    value.weight + '</td>';

                Pet += '<td>' +
                    value.type + '</td>';

                Pet += '<td>' +
                    value.likes + '</td>';

                Pet += '<td>' +
                    value.gender + '</td>';

                Pet += '<td>' +
                    value.favorite_pet + '</td>';

                Pet += '</tr>';
            });
        });

        //INSERTING ROWS INTO TABLE
        $('#table').append(Pet);
    )
});
```

```

        });
    });
</script>
</section>
</body>

</html>

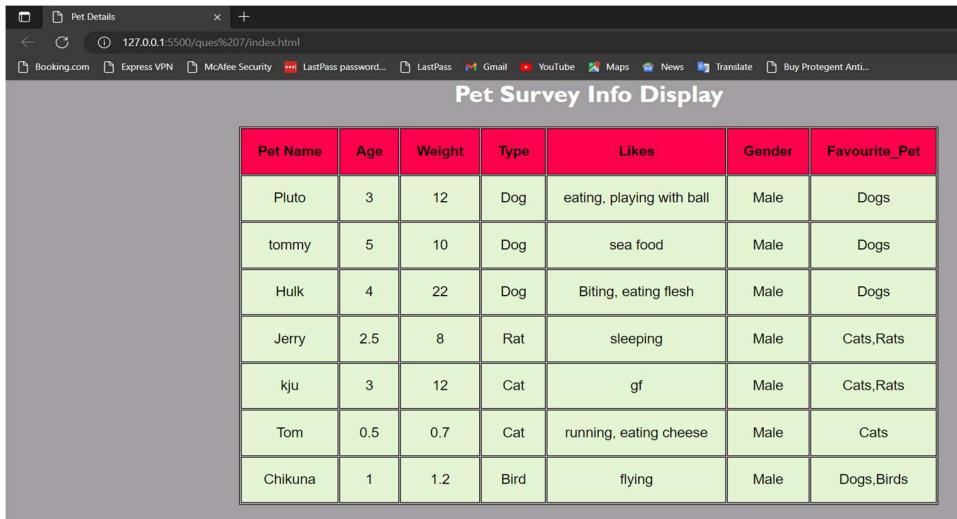
```

JSON

```
[
  {
    "name": "Pluto",
    "age": 3,
    "weight": 12,
    "type": "Dog",
    "likes": "eating, playing with ball",
    "gender": "Male",
    "favorite_pet": [
      "Dogs"
    ]
  },
  {
    "name": "tommy",
    "age": 5,
    "weight": 10,
    "type": "Dog",
    "likes": "sea food",
    "gender": "Male",
    "favorite_pet": [
      "Dogs"
    ]
  },
  {
    "name": "Hulk",
    "age": 4,
    "weight": 22,
    "type": "Dog",
    "likes": "Biting, eating flesh",
    "gender": "Male",
    "favorite_pet": [
      "Dogs"
    ]
  },
  {
    "name": "Jerry",
    "age": 2.5,
    "weight": 8,
    "type": "Cat",
    "likes": "Chasing mice, sleeping",
    "gender": "Male",
    "favorite_pet": [
      "Cats"
    ]
  }
]
```

```
        "type": "Rat",
        "likes": "sleeping",
        "gender": "Male",
        "favorite_pet": [
            "Cats, Rats"
        ]
    },
    {
        "name": "kju",
        "age": "3",
        "weight": "12",
        "type": "Cat",
        "likes": "gf",
        "gender": "Male",
        "favorite_pet": [
            "Cats",
            "Rats"
        ]
    },
    {
        "name": "Tom",
        "age": "0.5",
        "weight": "0.7",
        "type": "Cat",
        "likes": "running, eating cheese",
        "gender": "Male",
        "favorite_pet": [
            "Cats"
        ]
    },
    {
        "name": "Chikuna",
        "age": "1",
        "weight": "1.2",
        "type": "Bird",
        "likes": "flying",
        "gender": "Male",
        "favorite_pet": [
            "Dogs, Birds"
        ]
    }
]
```

Output



Pet Name	Age	Weight	Type	Likes	Gender	Favourite_Pet
Pluto	3	12	Dog	eating, playing with ball	Male	Dogs
tommy	5	10	Dog	sea food	Male	Dogs
Hulk	4	22	Dog	Biting, eating flesh	Male	Dogs
Jerry	2.5	8	Rat	sleeping	Male	Cats,Rats
kju	3	12	Cat	gf	Male	Cats,Rats
Tom	0.5	0.7	Cat	running, eating cheese	Male	Cats
Chikuna	1	1.2	Bird	flying	Male	Dogs,Birds

Ques 8:

Create a plain HTML page for B.Sc. Hons CS course, mentioning details like fee, eligibility criteria, papers with names and credits, and future possibilities after the course. A button for styling should be there at bottom of the page. On clicking on this button JavaScript should redesign the complete page using jQuery in a nice presentable way.

Code:

Format



HTML

```
<!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>B.Sc (Hons) Computer Science by Delhi University</title>
    <link rel="stylesheet" href="style.css" />
```

```

<script src="jquery.js"></script>
<script type="text/javascript" src="script.js"></script>
</head>
<body>
    <section class="header">
        <h1>BSc (Hons) Computer Science</h1>
    </section>
    <div class="container">
        <section class="fee">
            <h2>Fee</h2>
            <p>
                The professional course of BSc. (Hons) Computer Science has a fee
                ranging between 45,000-50,000 INR varying college-wise at The
                University of Delhi.
            </p>
        </section>

        <section class="eligibility">
            <h2>Eligibility</h2>
            <p>
                DU B.Sc (Hons) Computer Science Eligibility Criteria 2021, basic
                Requirements:
            </p>
            <ul>
                <li>
                    ↗ Applicants are required to have passed the Class 12 or
                    equivalent
                    exam in order to be eligible for admission.
                </li>
                <li>
                    ↗ Applicant are need to meet up the cut off issued by individual
                    colleges in order to apply for admission in the respective
                    college.
                </li>
                <li>
                    ↗ An applicant should have had Maths and Computer Science in
                    their
                    plus two course. Though it is not necessary to add the subjects in
                    the best-of-four calculation, scoring at least 60 per cent or more
                    in Mathematics is mandatory.
                </li>
                <li>
                    ↗ The university information bulletin states that selection for
                    the
                    course will be made on the basis of the best-of-four subjects that
                    include one language, Mathematics and any two subjects out of
                    Physics, Chemistry, Computer Science and Informatics Practices.
                </li>
            </ul>
        </section>
    </div>
</body>

```

has announced that besides English, if the students add any other Humanities or Commerce subject in their best-of-four calculation, they will face a two per cent deduction for each of the subjects.

```

<li>
  ↵ An applicant can apply for the course irrespective of the subjects they opted for in the +2 level although the university
</li>
<li>
  ↵ Students from other streams need to include one language, Mathematics, and two other academic subjects.
</li>
</ul>
</section>

<section class="course-structure">
  <h2>Course Structure</h2>
  <table>
    <thead>
      <tr>
        <th colspan="2">Course</th>
        <th colspan="2">Credits</th>
      </tr>
      <tr>
        <th colspan="2">&nbsp;</th>
        <th>Theory &plus; Practical</th>
        <th>Theory &plus; Practical</th>
      </tr>
    </thead>

    <tbody>
      <tr>
        <td colspan="4"><strong>Core Course</strong></td>
      </tr>
      <tr>
        <td colspan="2"><strong>(14 papers)</strong></td>
        <td>14 &Cross; 4 &equals; 56</td>
        <td>14 &Cross; 5 &equals; 70</td>
      </tr>
      <tr>
        <td colspan="4">
          <strong>Core Course Practical/ Tutorial*</strong>
        </td>
      </tr>
      <tr>
        <td colspan="2"><strong>(14 papers)</strong></td>
        <td>14 &Cross; 2 &equals; 28</td>
        <td>14 &Cross; 1 &equals; 14</td>
      </tr>
    </tbody>
  </table>
</section>

```

```

</tr>

<tr>
    <td colspan="4"><strong>Elective Course</strong></td>
</tr>
<tr>
    <td colspan="4"><strong>(8 Papers)</strong></td>
</tr>
<tr>
    <td colspan="2">A.1. Discipline Specific Elective</td>
    <td>4 &Cross; 4 &equals; 16</td>
    <td>4 &Cross; 5 &equals; 20</td>
</tr>
<tr>
    <td colspan="4"><strong>(4 Papers)</strong></td>
</tr>
<tr>
    <td colspan="2">
        A.2. Discipline Specific Elective Practical/ Tutorial*
    </td>
    <td>4 &Cross; 2 &equals; 8</td>
    <td>4 &Cross; 1 &equals; 4</td>
</tr>
<tr>
    <td colspan="4"><strong>(4 Papers)</strong></td>
</tr>
<tr>
    <td colspan="2">B.1. Generic Elective/ Interdisciplinary</td>
    <td>4 &Cross; 4 &equals; 16</td>
    <td>4 &Cross; 5 &equals; 20</td>
</tr>
<tr>
    <td colspan="4"><strong>(4 Papers)</strong></td>
</tr>
<tr>
    <td colspan="2">B.2. Generic Elective Practical/ Tutorial*</td>
    <td>4 &Cross; 2 &equals; 8</td>
    <td>4 &Cross; 1 &equals; 4</td>
</tr>

<tr>
    <td colspan="4"><strong>(4 Papers)</strong></td>
</tr>
<tr>
    <td colspan="4">
        <strong>
            >* Optional Dissertation or project work in place of one
            Discipline Specific Elective paper (6 credits) in 6th
        </strong>
    </td>
</tr>

```

```

        Semester</strong>
      >
    </td>
  </tr>

  <tr>
    <td colspan="4"><strong>Ability Enhancement Courses</strong></td>
  </tr>
  <tr>
    <td colspan="4">
      <strong>1. Ability Enhancement Compulsory</strong>
    </td>
  </tr>
  <tr>
    <td colspan="2"><strong>(2 papers of 4 credit each)</strong></td>
    <td>4 &Cross; 2 &equals; 8</td>
    <td>4 &Cross; 2 &equals; 4</td>
  </tr>
  <tr>
    <td colspan="4">Environmental Science</td>
  </tr>
  <tr>
    <td colspan="4">English/MIL Communication</td>
  </tr>
  <tr>
    <td colspan="2">
      <strong>2. Skill Enhancement Elective</strong>
    </td>
    <td>4 &Cross; 2 &equals; 8</td>
    <td>4 &Cross; 2 &equals; 8</td>
  </tr>
  <tr>
    <td colspan="4"><strong>(2 papers of 4 credit each)</strong></td>
  </tr>

  <tr>
    <td colspan="2"><strong>Total Credit</strong></td>
    <td><strong>140</strong></td>
    <td><strong>140</strong></td>
  </tr>

```

</tbody>

```

<tfoot>
  <td colspan="2">
    <strong>

```

```

        >* wherever there is a practical there will be no tutorial and
           vice-versa</strong>
      >
    </td>
  </tfoot>
</table>
</section>

<section class="papers">
  <h2>Papers (Core)</h2>
  <ol>
    <li>Programming Fundamentals using C++</li>
    <li>Computer System Architecture</li>
    <li>Programming in JAVA</li>
    <li>Discrete Structure</li>
    <li>Data Structures</li>
    <li>Operating System</li>
    <li>Computer Networks</li>
    <li>Design and Analysis of Algorithms</li>
    <li>Software Engineering</li>
    <li>Database Management Systems</li>
    <li>Internet Technologies</li>
    <li>Theory of Computation</li>
    <li>Artificial Intelligence</li>
    <li>Computer Graphics</li>
  </ol>
  <a href="http://cs.du.ac.in/programmes/bsc/" target="_blank">
    Go to Delhi University official site for more info</a>
  >
</section>

<section class="future">
  <h2>Future possibilities</h2>
  <div class="grid-3-cols">
    <div class="future-box">
      <svg
        xmlns="http://www.w3.org/2000/svg"
        class="future-icons"
        fill="none"
        viewBox="0 0 24 24"
        stroke="currentColor"
        width="24px"
        height="24px"
      >
        <path
          stroke-linecap="round"
          stroke-linejoin="round"
          stroke-width="2"

```

```

        d="M16 8v8m-4-5v5m-4-2v2m-2 4h12a2 2 0 002-2V6a2 2 0 00-2-
2H6a2 2 0 00-2 2v12a2 2 0 002 2z"
    />
</svg>
<p class="future-head">Data Scientist</p>
<p class="future-text">
    Data scientists are a new breed of analytical data expert who
have
    the technical skills to solve complex problems and curiosity to
    find out what problems needs to be solved.
</p>
<p>Toolkit: Data visualization, Machine learning, Deep
learning,</p>
</div>

<div class="future-box">
    <svg
        xmlns="http://www.w3.org/2000/svg"
        class="future-icons"
        fill="none"
        viewBox="0 0 24 24"
        stroke="currentColor"
        width="24px"
        height="24px"
    >
        <path
            stroke-linecap="round"
            stroke-linejoin="round"
            stroke-width="2"
            d="M10 20l4-16m4 4l4 4-4 4M6 16l-4-4 4-4"
        />
    </svg>
    <p class="future-head">Web Developer</p>
    <p class="future-text">
        Web developers create websites & web applications. There are 3
        main categories: Front End Developers, Back End Developers &
Full
        Stack Developers.
    </p>
    <p>Toolkit: HTML, CSS, JavaScript, PHP and</p>
</div>

<div class="future-box">
    <svg
        xmlns="http://www.w3.org/2000/svg"
        class="future-icons"
        fill="none"
        viewBox="0 0 24 24"

```

```

        stroke="currentColor"
        width="24px"
        height="24px"
    >
    <path
        stroke-linecap="round"
        stroke-linejoin="round"
        stroke-width="2"
        d="M12 18h.01M8 21h8a2 2 0 002-2V5a2 2 0 00-2-2H8a2 2 0 00-2
2v14a2 2 0 002 2z"
    />
</svg>
<p class="future-head">Android Developer</p>
<p class="future-text">
    An Android Developer is a Software Developer who specializes in
    designing applications, games for the Android marketplace.

```

Android

```

    Developers also have to be trendy.
</p>

<p>Toolkit: Java, Kotlin, C/C++, MySQL Databases</p>
</div>

<div class="future-box">
    <svg
        xmlns="http://www.w3.org/2000/svg"
        class="future-icons"
        fill="none"
        viewBox="0 0 24 24"
        stroke="currentColor"
        width="24px"
        height="24px"
    >
        <path
            stroke-linecap="round"
            stroke-linejoin="round"
            stroke-width="2"
            d="M11 5H6a2 2 0 00-2v11a2 2 0 002 2h11a2 2 0 002-2v-5m-1.414-9.414a2 2 0 11.828 2.828L11.828 15H9v-2.828l8.586-8.586z"
        />
    </svg>
    <p class="future-head">Graphic Designer</p>
    <p class="future-text">
        Graphic designers are visual communicators, who create visual
        concepts using computer software. They communicate ideas to
        inspire and inform users through art forms..
    </p>
    <p>Toolkit: Adobe Illustrator, Adobe Photoshop</p>

```

```

</div>

<div class="future-box">
  <svg
    xmlns="http://www.w3.org/2000/svg"
    class="future-icons"
    fill="none"
    viewBox="0 0 24 24"
    stroke="currentColor"
    width="24px"
    height="24px"
  >
    <path
      stroke-linecap="round"
      stroke-linejoin="round"
      stroke-width="2"
      d="M4 7v10c0 2.21 3.582 4 8 4s8-1.79 8-4V7M4 7c0 2.21 3.582 4
8 4s8-1.79 8-4M4 7c0-2.21 3.582-4 8-4s8 1.79 8 4m0 5c0 2.21-3.582 4-8 4s-8
1.79-8-4"
    />
  </svg>
  <p class="future-head">Database Manager</p>
  <p class="future-text">
    Database managers develop and maintain organization's databases.
    They create data storage and retrieval systems, troubleshoot
    database issues.
  </p>
  <p>ToolKit: MySQL, Oracle RDBMS, PhpMyAdmin</p>
</div>

<div class="future-box">
  <svg
    xmlns="http://www.w3.org/2000/svg"
    class="future-icons"
    fill="none"
    viewBox="0 0 24 24"
    stroke="currentColor"
    width="24px"
    height="24px"
  >
    <path
      stroke-linecap="round"
      stroke-linejoin="round"
      stroke-width="2"
      d="M10 20l4-16m4 4l4 4-4 4m6 16l-4-4 4-4"
    />
  </svg>
  <p class="future-head">Software Engineer</p>

```

```

        <p class="future-text">
            A software engineer applies mathematical analysis and the
            principles of computer science in order to design and develop
            computer software.
        </p>
        <p>Toolkit: Programming and coding, Design and architecture</p>
    </div>
</div>
</section>

<div class="design-button">
    <button class="btn">Click to design the page</button>
</div>
</div>
<footer>build & designed by Ujjawal Kumar &hearts;</footer>
</body>
</html>

```

JavaScript

```

$(document).ready(function () {
    $(".design-button").click(function () {
        $("body").css({
            "background-color": "#f8f0fc",
            "font-family": "sans-serif",
            color: "#000",
            "font-size": "16px",
        });

        $(".container").css({
            width: "70%",
            margin: "0 auto",
            "margin-top": "64px",
            "line-height": "1.5",
        });

        $(".header").css({
            "background-color": "#862e9c",
            "margin-bottom": "96px",
        });

        $(".header h1").css({
            "text-align": "center",
            padding: "24px",
            "font-size": "42px",
            color: "#fff",
        });
    });
}

```

```
$(".grid-3-cols").css({
  display: "grid",
  "grid-template-columns": "repeat(3, 1fr)",
  "column-gap": "40px",
  "row-gap": "48px",
});

$(".fee").css({ "margin-bottom": "96px" });

$(".eligibility").css({ "margin-bottom": "96px" });

$(".future").css({ "margin-bottom": "96px" });

$(".course-structure").css({ "margin-bottom": "96px" });

$(".papers").css({ "margin-bottom": "96px" });

$("a:link").css({
  "text-decoration": "none",
  color: "#fff",
  "background-color": "#9c36b5",
  padding: "10px",
  display: "inline-block",
  "border-radius": "10px",
  "margin-top": "12px",
  transition: "all 0.4s",
  "font-size": "16px",
});

$("a:visited").css({
  "text-decoration": "none",
  color: "#fff",
  "background-color": "#9c36b5",
  padding: "10px",
  display: "inline-block",
  "border-radius": "10px",
  "margin-top": "12px",
  transition: "all 0.4s",
  "font-size": "16px",
});

$(".btn").css({
  "text-decoration": "none",
  color: "#fff",
  "background-color": "#9c36b5",
  padding: "10px",
  display: "inline-block",
  "border-radius": "10px",
```

```
        "margin-top": "12px",
        transition: "all 0.4s",
        "font-size": "16px",
        cursor: "pointer",
        "text-transform": "uppercase",
        "letter-spacing": "0.5px",
        border: "0",
        "font-weight": "600",
    });
}

$("a:hover").css({ "background-color": "#862e9c" });

 $("a:active").css({ "background-color": "#862e9c" });

 $(".btn:hover").css({ "background-color": "#862e9c" });

 $("h2").css({
    "font-size": "36px",
    "margin-bottom": "28px",
});

 $(".eligibility p").css({
    "margin-bottom": "18px",
});

 $(".eligibility li").css({
    "list-style": "none",
    "margin-bottom": "16px",
});

 $(".eligibility li:last-child ").css({ "margin-bottom": "0" });

 $(".papers li").css({
    "margin-bottom": "12px",
    "padding-left": "12px",
    "margin-left": "24px",
});

 $(".design-button ").css({ "margin-bottom": "96px" });

 $(".future-head").css({
    "font-size": "18px",
    "margin-bottom": "8px",
});

 $(".future-icons").css({
    stroke: "#9c36b5",
    width: "24px",
});
```

```
    height: "24px",
    "margin-bottom": "12px",
});

$("table").css({
    "border-collapse": "collapse",
});

$("table td").css({
    padding: "16px 32px",
});

$("table table th").css({
    width: "40%",
});

$("thead tr:nth-child(2)").css({
    "text-align": "center",
});

$("tbody tr td:not(:first-child)").css({
    "text-align": "center",
});

$("tbody tr:nth-child(even)").css({
    "background-color": "#f3d9fa",
});

$("tbody tr:nth-child(odd)").css({
    "background-color": "#eeeeefb",
});

$("thead tr").css({
    "background-color": "#9c36b5",
    color: "#fff",
});

$("table th").css({
    padding: "16px 32px",
});

$("footer").css({
    "text-align": "center",
    "border-bottom": "8px solid #9c36b5",
});
});
```

Output

Before

The screenshot shows a web browser window with the URL 127.0.0.1:5000/08-Course-Information/index.html. The page title is "BSc (Hons) Computer Science". Below the title, there is a section titled "Fee" with a note about the fee range between 45,000-50,000 INR. A section titled "Eligibility" follows, with a note about the basic requirements. The main content is a "Course Structure" table:

Course	Credits	Theory + Practical	Theory + Practical
Core Course (14 papers)	$14 \times 4 = 56$	$14 \times 5 = 70$	
Core Course Practical/ Tutorial* (14 papers)	$14 \times 2 = 28$	$14 \times 1 = 14$	
Elective Course (8 Papers)			
A.1. Discipline Specific Elective (4 Papers)	$4 \times 4 = 16$	$4 \times 5 = 20$	
A.2. Discipline Specific Elective Practical/ Tutorial* (4 Papers)	$4 \times 2 = 8$	$4 \times 1 = 4$	
B.1. Generic Elective/ Interdisciplinary (4 Papers)	$4 \times 4 = 16$	$4 \times 5 = 20$	
B.2. Generic Elective Practical/ Tutorial* (4 Papers)	$4 \times 2 = 8$	$4 \times 1 = 4$	

* Optional Dissertation or project work in place of one Discipline Specific Elective paper (6 credits) in 6th Semester

After

The screenshot shows a web browser window with the URL 127.0.0.1:5000/08-Course-Information/index.html. The page title is "BSc (Hons) Computer Science". Below the title, there is a section titled "Fee" with a note about the fee range between 45,000-50,000 INR. A section titled "Eligibility" follows, with a note about the basic requirements. The main content is a "Course Structure" table:

Course	Credits	Theory + Practical	Theory + Practical
Core Course (14 papers)	$14 \times 4 = 56$	$14 \times 5 = 70$	
Core Course Practical/ Tutorial* (14 papers)	$14 \times 2 = 28$	$14 \times 1 = 14$	
Elective Course (8 Papers)			
A.1. Discipline Specific Elective (4 Papers)	$4 \times 4 = 16$	$4 \times 5 = 20$	
A.2. Discipline Specific Elective Practical/ Tutorial* (4 Papers)	$4 \times 2 = 8$	$4 \times 1 = 4$	
B.1. Generic Elective/ Interdisciplinary (4 Papers)	$4 \times 4 = 16$	$4 \times 5 = 20$	
B.2. Generic Elective Practical/ Tutorial* (4 Papers)	$4 \times 2 = 8$	$4 \times 1 = 4$	

Papers (Core)

1. Programming Fundamentals using C++
2. Computer System Architecture
3. Programming in JAVA
4. Discrete Structure
5. Data Structures
6. Operating System
7. Computer Networks
8. Design and Analysis of Algorithms
9. Software Engineering
10. Database Management Systems
11. Internet Technologies
12. Theory of Computation
13. Artificial Intelligence
14. Computer Graphics

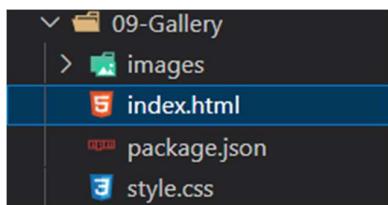
[Go to Delhi University official site for more info](#)

Ques 9:

Create an HTML page for an image gallery which shows the use of BOOTSTRAP to rearrange and resize its contents on resizing the browser.

Code:

Format



HTML

```
<!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>Gallery — using bootstrap</title>
```

```

<!-- BOOTSTRAP CDN -->
<link
  rel="stylesheet"
  href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.
css"
  integrity="sha384-
BVYiISIfeK1dGmJRAkycuHAHrg320mUcww7on3RYdg4Va+PmSTsz/K68vbdEjh4u"
  crossorigin="anonymous"
/>
<link href="style.css" rel="stylesheet" />
</head>
<body>
  <main>
    <section class="section-gallery container" id="gallery">
      <h1 class="text-center heading">Image gallery</h1>
      <div class="row">
        
        
        
        
      </div>
      <div class="row align-items-center">
        
        
      </div>
    </section>
  </main>
</body>

```

```

        
        
    </div>
    <div class="row">
        

        
        
        
    </div>
</section>

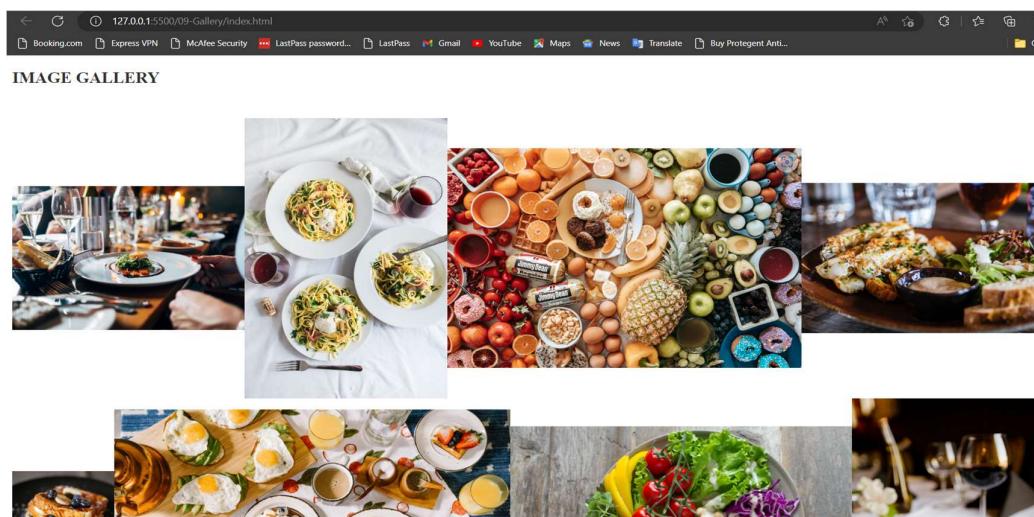
<footer>
    <p class="text-center">&copy; build and designed by Ujjawal Kumar</p>
</footer>
</main>
</body>
</html>

```

CSS

```
.heading {  
    margin-bottom: 48px;  
    font-weight: 600;  
    color: #333;  
    text-transform: uppercase;  
}  
  
.section-gallery {  
    margin-bottom: 48px;  
}  
  
.section-gallery div {  
    display: flex;  
    align-items: center;  
    justify-content: center;  
}  
  
img {  
    transition: all 0.4s;  
    overflow: hidden;  
}  
  
img:hover {  
    transform: scale(1.2);  
}
```

Output



On resizing

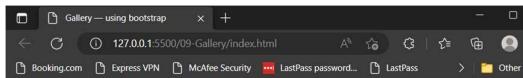


IMAGE GALLERY



IMAGE GALLERY



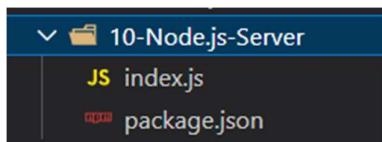
© build and designed by Ujjawal Kumar

Ques 10:

Create an HTTP server using Node.js which handles requests on port 10000 or a free port beyond 10000. Modify the server in such a way that opening localhost:10000 will display “Hello world, This is my Node.js server” on browser.

Code:

Format



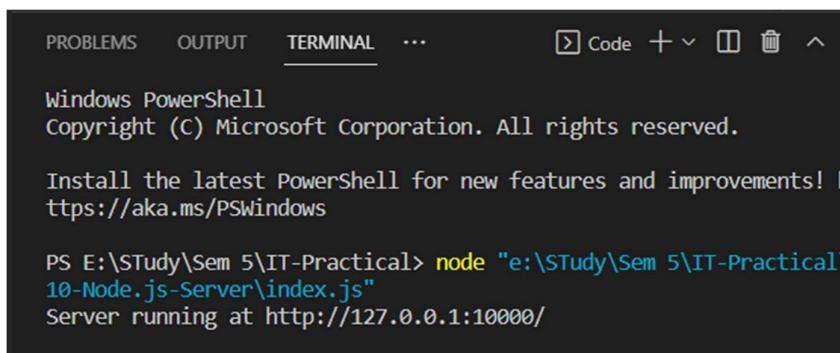
JavaScript

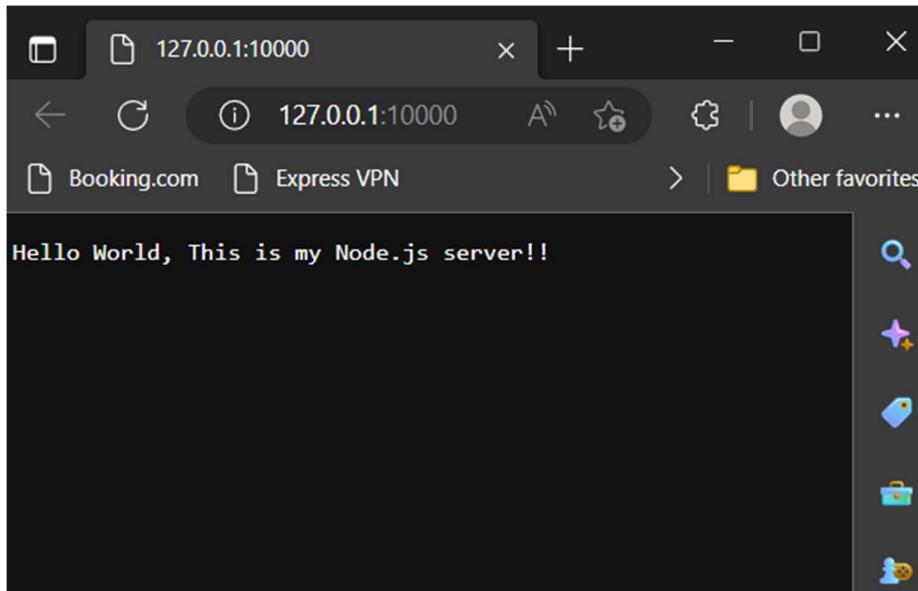
```
const projectName = "Node.js-Hello-World";
const http = require("http");
//create a hostname and port number
const hostName = "127.0.0.1";
const port = 10000;

//create server
const server = http.createServer((request, result) => {
  result.statusCode = 200;
  result.setHeader("Content-Type", "text/plain");
  result.end("Hello World, This is my Node.js server!!");
});

//set server to listen
server.listen(port, hostName, () => {
  console.log(`Server running at http://${hostName}:${port}/`);
});
```

Output



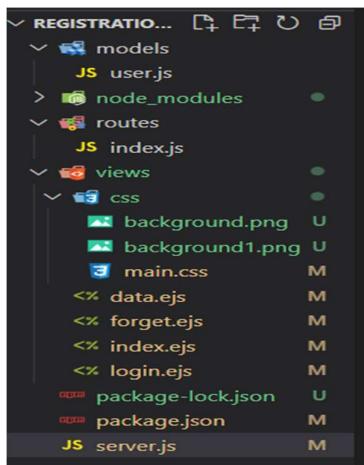


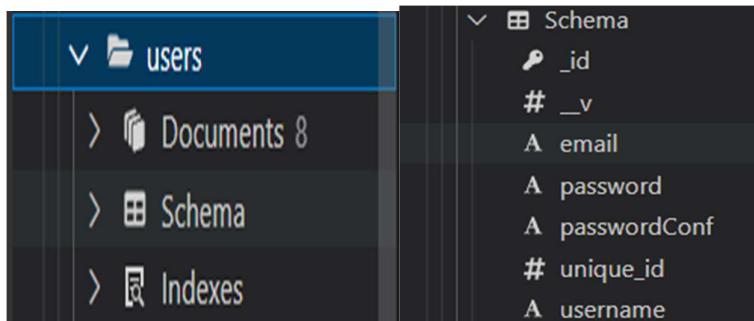
Ques 11:

Create index.html file containing two forms for SignIn and SignUp. Submitting SignIn form should search for credentials in mysql database using server created in previous practical. On successful signin, a welcome page should be displayed. Submitting SignUp form should insert new entry for credentials in mysql database using server created in previous practical. On successful signup, user should be returned back to index.html.

Code:

Format





User.js

```
var mongoose = require('mongoose');
var Schema = mongoose.Schema;

userSchema = new Schema( {

    unique_id: Number,
    email: String,
    username: String,
    password: String,
    passwordConf: String
}),
User = mongoose.model('User', userSchema);

module.exports = User;
```

index.js

```
var express = require('express');
var router = express.Router();
var User = require('../models/user');

router.get('/', function (req, res, next) {
  return res.render('index.ejs');
});

router.post('/', function(req, res, next) {
  console.log(req.body);
  var personInfo = req.body;

  if(!personInfo.email || !personInfo.username || !personInfo.password || !personInfo.passwordConf){
    res.send();
  }
});
```

```

    } else {
      if (personInfo.password == personInfo.passwordConf) {

        User.findOne({email:personInfo.email},function(err,data){
          if(!data){
            var c;
            User.findOne({},function(err,data){

              if (data) {
                console.log("if");
                c = data.unique_id + 1;
              }else{
                c=1;
              }

              var newPerson = new User({
                unique_id:c,
                email:personInfo.email,
                username: personInfo.username,
                password: personInfo.password,
                passwordConf: personInfo.passwordConf
              });

              newPerson.save(function(err, Person){
                if(err)
                  console.log(err);
                else
                  console.log('Success');
              });

              }).sort({_id: -1}).limit(1);
              res.send({"Success":"You are registered, You can login
now."});
            }else{
              res.send({"Success":"Email is already used."});
            }
          });
        }else{
          res.send({"Success":"password is not matched"});
        }
      });
    });

router.get('/login', function (req, res, next) {
  return res.render('login.ejs');
});
```

```

router.post('/login', function (req, res, next) {
    //console.log(req.body);
    User.findOne({email:req.body.email},function(err,data){
        if(data){

            if(data.password==req.body.password){
                //console.log("Done Login");
                req.session.userId = data.unique_id;
                //console.log(req.session.userId);
                res.send({"Success":"Success!"});

            }else{
                res.send({"Success":"Wrong password!"});
            }
        }else{
            res.send({"Success":"This Email Is not registered!"});
        }
    });
});

router.get('/profile', function (req, res, next) {
    console.log("profile");
    User.findOne({unique_id:req.session.userId},function(err,data){
        console.log("data");
        console.log(data);
        if(!data){
            res.redirect('/');
        }else{
            //console.log("found");
            return res.render('data.ejs',
            {"name":data.username,"email":data.email});
        }
    });
});

router.get('/logout', function (req, res, next) {
    console.log("logout")
    if (req.session) {
        // delete session object
        req.session.destroy(function (err) {
            if (err) {
                return next(err);
            } else {
                return res.redirect('/');
            }
        });
    }
});

```

```

router.get('/forgetpass', function (req, res, next) {
    res.render("forget.ejs");
});

router.post('/forgetpass', function (req, res, next) {
    //console.log('req.body');
    //console.log(req.body);
    User.findOne({email:req.body.email},function(err,data){
        console.log(data);
        if(!data){
            res.send({"Success":"This Email Is not registered!"});
        }else{
            // res.send({"Success":"Success!"});
            if (req.body.password==req.body.passwordConf) {
                data.password=req.body.password;
                data.passwordConf=req.body.passwordConf;

                data.save(function(err, Person){
                    if(err)
                        console.log(err);
                    else
                        console.log('Success');
                        res.send({"Success":"Password changed!"});
                });
            }else{
                res.send({"Success":"Password does not matched! Both Password
should be same."});
            }
        }
    });
});

module.exports = router;

```

HTML

Data.ejs

```

<!DOCTYPE html>
<html>
<head>
    <title>Welcome</title>
    <link rel="stylesheet"
    href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css">
    <script
    src="https://ajax.googleapis.com/ajax/libs/jquery/3.2.1/jquery.min.js">

```

```

        </script>
        <script
src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"></script>
    <link rel="stylesheet" href=".css/main.css">
</head>
<body>
    <div class="col-md-4 col-md-offset-4">
        <div>
            <p>Profile Detail</p>
        </div>
        <div>
            <center>
                <table class="table table-hover text-center">
                    <tr><td>Name </td><td><%= name %></td></tr>
                    <tr><td>Email </td><td><%= email %></td></tr>
                </table>
            </center>
        </div>
        <div class="abc">
            <a href ="/logout">Logout</a>
        </div>
    </div>
</body>
</html>

```

Forget.ejs

```

<!DOCTYPE html>
<html>
<head>
    <title>Forget Password</title>
    <link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css">
    <script
src="https://ajax.googleapis.com/ajax/libs/jquery/3.2.1/jquery.min.js">
    </script>
    <script
src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"></script>
    <link rel="stylesheet" href=".css/main.css">

    <script type="text/javascript">
        $(document).ready(function(){
            $( "#form2" ).submit(function(event) {

```

```

        event.preventDefault();

        $.ajax({
            type: 'POST',
            url: '/forgetpass',
            data: $('#form2').serialize(),
            dataType: "json",
            success: function(response){
                //alert("a");
                //console.log(response.Success);
                $('#form2')[0].reset();
                //alert("abc");
                document.getElementById("check").innerHTML=response.Su
ccess;

                setTimeout(function(){
                    document.getElementById("check").innerHTML="";
                },10000);
                if (response.Success=="Password changed!") {
                    document.getElementById("aa").click();
                };
            },
            error: function() {
            }
        })
    });


```

</script>

</head>

<body>

```

<div class="col-md-4 col-md-offset-4">
    <div>
        <p>Change Password</p>
    </div>
    <div class="form-group">
        <form id="form2" method="post">
            <input type="text" name="email" placeholder="E-mail"
required="" class="form-control"><br/>
            <input type="password" name="password"
placeholder="Password" required="" class="form-control"><br/>
            <input type="password" name="passwordConf"
placeholder="Confirm Password" required="" class="form-control"><br/>
            <input type="submit" value="Change" class="btn btn-su
ccess">
        </form>
    </div>

```

```

        <div class="mssg bg-danger">
            <span id="check"></span>
        </div>
        <div id="LangTable"><a href="/profile" id="aa"></a>
        </div>
        <div><span>Login?</span><a href="/login" id="aa">Click here</a></div>
        </div>
        <div id="LangTable"><a href="/login" id="aa"></a>
        </div>
    </div>

</body>
</html>

```

Index.ejs

```

<!DOCTYPE html>
<html>
<head>
    <title>Registration</title>
    <link rel="stylesheet"
    href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css">
        <script
    src="https://ajax.googleapis.com/ajax/libs/jquery/3.2.1/jquery.min.js">
        </script>
        <script
    src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"><script>
    <link rel="stylesheet" href=".css/main.css">

    <script type="text/javascript">
        $(document).ready(function(){
            $( "#form1" ).submit(function(event) {
                event.preventDefault();

                $.ajax({
                    type: 'POST',
                    url: '/',
                    data: $('#form1').serialize(),
                    dataType: "json",
                    success: function(response){
                        //alert("a");
                        //console.log(response.Success);
                        $('#form1')[0].reset();

```

```

        document.getElementById("check").innerHTML=response.Success;
    //ADD THIS CODE
    setTimeout(function(){
        document.getElementById("check").innerHTML="";
    },10000);
    if (response.Success=="You are registered, You can
login now.") {
        document.getElementById("aa").click();
    },
    error: function() {
    }
})
});
});
</script>
</head>
<body>

<div class="col-md-4 col-md-offset-4">
<div>
    <p>Register Now
    </p>
</div>
<div class="form-group">
    <form id="form1" method="post">
        <input type="email" name="email" placeholder="E-mail"
required="" class="form-control"><br/>
        <input type="text" name="username" placeholder="Username"
required="" class="form-control"><br/>
        <input type="password" name="password" placeholder="Password"
required="" class="form-control"><br/>
        <input type="password" name="passwordConf"
placeholder="Confirm Password" required="" class="form-control"><br/>
        <input type="submit" value="Register" class="btn btn-success">
    </form>
</div>

<div class="mssg bg-danger">
    <span id="check"></span>
</div>
<div>
    <span>Already Registered! <a href="/login">Login</a></span>
</div>
<div id="LangTable"><a href="/login" id="aa"></a>
</div>
</div>

```

```
</body>
</html>
```

Login.ejs

```
<!DOCTYPE html>
<html>
<head>
    <title>Login</title>
    <link rel="stylesheet"
    href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css">
    <script
    src="https://ajax.googleapis.com/ajax/libs/jquery/3.2.1/jquery.min.js">
        </script>
    <script
    src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"><script>
    <link rel="stylesheet" href=".css/main.css">

    <script type="text/javascript">
        $(document).ready(function(){

            $('#form').submit(function(event) {
                event.preventDefault();

                $.ajax({
                    type: 'POST',
                    url: '/login',
                    data: $('#form').serialize(),
                    dataType: "json",
                    success: function(response){
                        //alert("a");
                        //console.log(response.Success);
                        $('#form')[0].reset();

                        document.getElementById("check").innerHTML=response.Success;
                        //ADD THIS CODE
                        setTimeout(function(){
                            document.getElementById("check").innerHTML="";
                        },1000);
                        if (response.Success=="Success!") {
                            document.getElementById("aa").click();
                        };
                    },
                    error: function() {
                }
            })
        })
    
```

```

        })
    });


```

```

        });
    </script>
</head>
<body>
    <div class="col-md-4 col-md-offset-4">
        <div>
            <p>Login</p>
        </div>
        <div class="form-group">
            <form id="form" method="post" >
                <input type="text" name="email" placeholder="E-mail"
required="" class="form-control"><br/>
                <input type="password" name="password" placeholder="Password"
required="" class="form-control"><br/>
                <input type="submit" value="Login" class="btn btn-success">
            </form>
        </div>
        <div class="mssg bg-danger">
            <span id="check" ></span>
        </div>
        <div id="LangTable"><a href="/profile" id="aa"></a>
        </div>
        <div><span>Do you forgot password?</span><a href="/forgetpass">Click
here</a>
            <div><span>Create a new Account?</span><a href="/">Register here</a>

```

```

        </div>
    </div>
</body>
</html>

```

CSS

```

body {
    --color-primary: #009579;
    --color-primary-dark: #007f67;
    --color-secondary: #252c6a;
    --color-error: #cc3333;
    --color-success: #4bb544;
    --border-radius: 4px;
    text-align: center !important;
    margin: 0;
    height: 100vh;
}

```

```

        display: flex;

        font-size: 18px;
        /* background-color: rgb(154, 225, 187); */
        background: url("./background1.png");
        background-size: cover;
    }

p{
    margin-top: 20px;
    font-size: 30px;

}

input{
    text-align: center;
}

.mssg{
    margin-top: 5px;
    margin-bottom: 5px;
    border-radius: 5px;
}

```

Server.js

```

var express = require('express');
var env = require('dotenv').config()
var ejs = require('ejs');
var path = require('path');
var app = express();
var bodyParser = require('body-parser');
var mongoose = require('mongoose');
var session = require('express-session');
var MongoStore = require('connect-mongo')(session);

mongoose.connect('mongodb://localhost:27017/db');
var db=mongoose.connection;
db.on('error', console.log.bind(console, "connection error"));
db.once('open', function(callback){
    console.log("connection succeeded");
})

db.on('error', console.error.bind(console, 'connection error:'));
db.once('open', function () {
});

```

```

app.use(session({
  secret: 'work hard',
  resave: true,
  saveUninitialized: false,
  store: new MongoStore({
    mongooseConnection: db
  })
}));

app.set('views', path.join(__dirname, 'views'));
app.set('view engine', 'ejs');

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

app.use(express.static(__dirname + '/views'));

var index = require('./routes/index');
app.use('/', index);

// catch 404 and forward to error handler
app.use(function (req, res, next) {
  var err = new Error('File Not Found');
  err.status = 404;
  next(err);
});

// error handler
// define as the last app.use callback
app.use(function (err, req, res, next) {
  res.status(err.status || 500);
  res.send(err.message);
});

const PORT = process.env.PORT || 10000;
app.listen(PORT, function () {
  console.log('Server is started on http://127.0.0.1:' +PORT);
});

```

Output

Login

E-mail

Password

Login

Do you forgot password?[Click here](#)
Create a new Account?[Register here](#)

Register Now

E-mail

Username

Password

Confirm Password

Register

Already Registered! [Login](#)

Change Password

E-mail

Password

Confirm Password

Change

[Login?Click here](#)

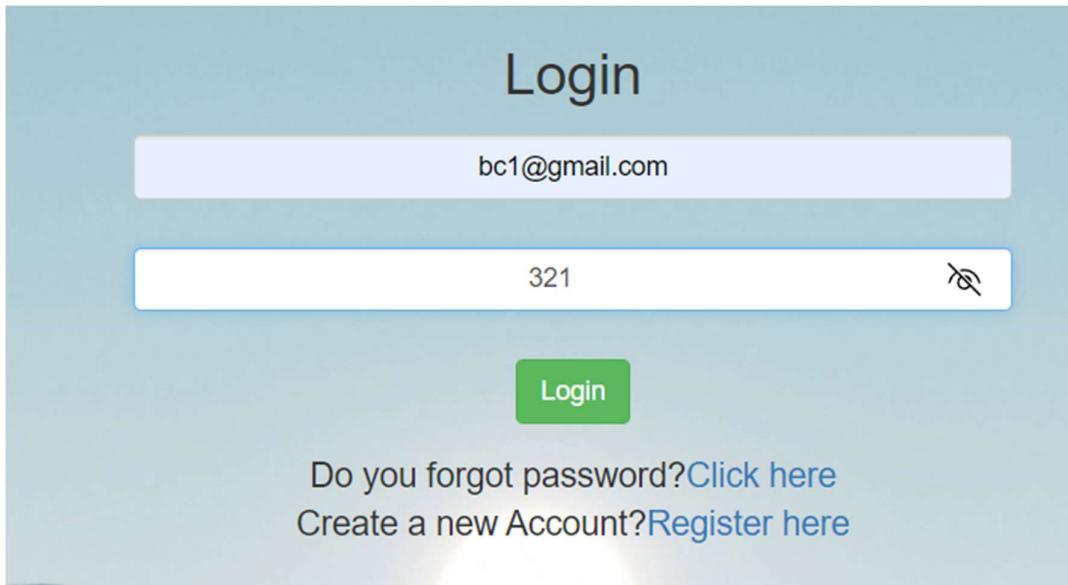
Working of login page

The image consists of two vertically stacked screenshots of a web application. The top screenshot shows a 'Login' page with a light blue header. It contains two input fields: one for 'Email' containing 'bc1@gmail.com' and another for 'Password' containing '123'. Below these fields is a green 'Login' button. At the bottom of the page, there are links: 'Do you forgot password? [Click here](#)' and 'Create a new Account? [Register here](#)'. The bottom screenshot shows a 'Profile Detail' page with a light blue header. It displays user information in a table format: 'Name' is 'ujjawal tomcat' and 'Email' is 'bc1@gmail.com'. At the bottom of this page is a blue 'Logout' link.

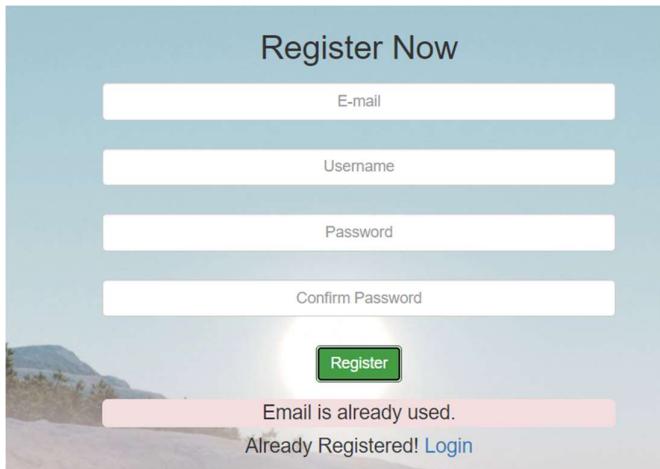
Working of Forgot password Page

The image shows a 'Change Password' page with a light blue header. It has three input fields: the first is filled with 'bc1@gmail.com', the second with '...', and the third with '...'. Below these fields is a green 'Change' button. At the bottom of the page is a blue link: 'Login? [Click here](#)'.

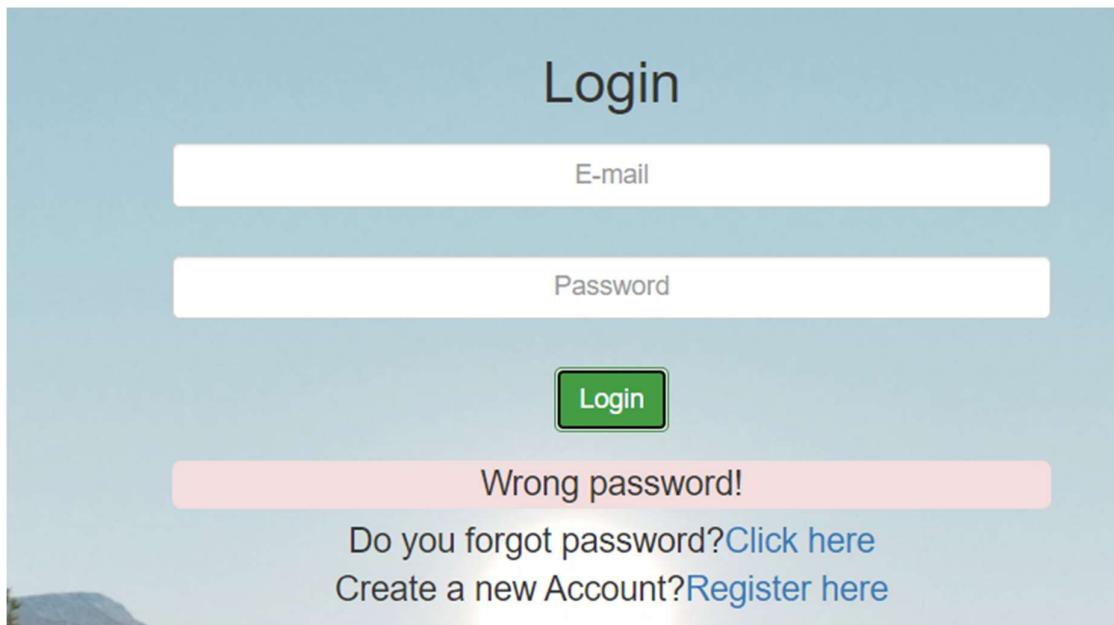
Re again login



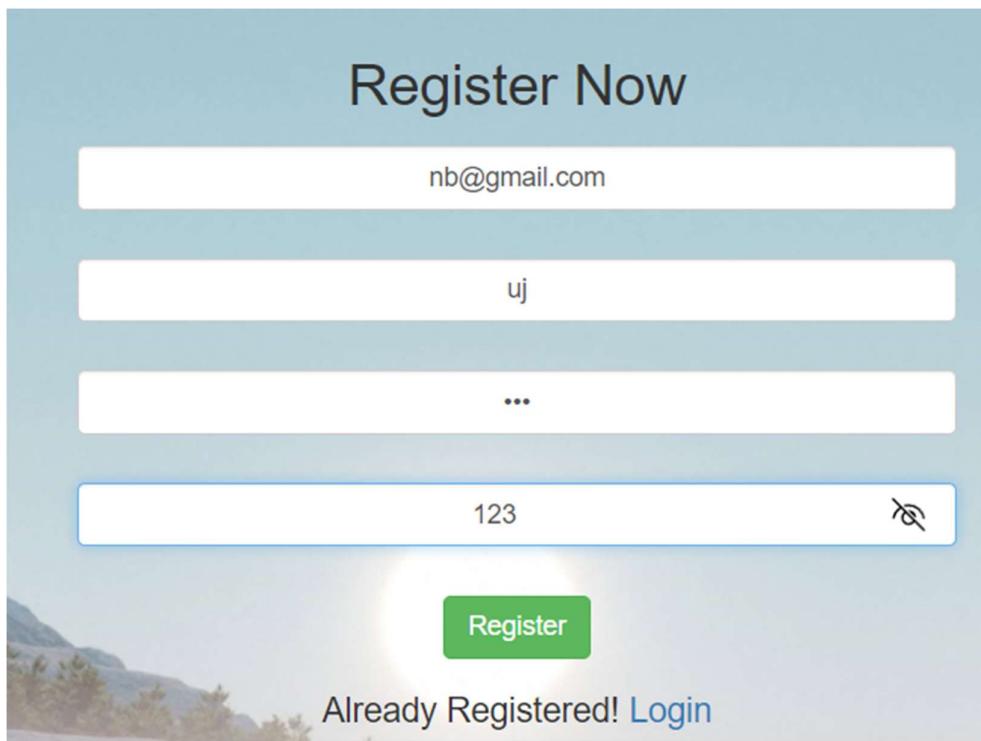
If email is already used



If password is wrong



Working of registration page





Console

```
PS E:\STudy\Registration-and-Login-Form-in-Nodejs-and-MongoDB> node index.js
Server is started on http://127.0.0.1:10000
connection succeeded
profile
data
{
  _id: new ObjectId("62f29060af9455410d870d52"),
  unique_id: 7,
  email: 'bc1@gmail.com',
  username: 'ujjawal tomcat',
  password: '123',
  passwordConf: '123',
  __v: 0
}
logout
{
  _id: new ObjectId("62f29060af9455410d870d52"),
  unique_id: 7,
  email: 'bc1@gmail.com',
  username: 'ujjawal tomcat',
  password: '123',
  passwordConf: '123',
  __v: 0
}
{
  _id: new ObjectId("62f29060af9455410d870d52"),
  unique_id: 7,
  email: 'bc1@gmail.com',
  username: 'ujjawal tomcat',
  password: '123',
  passwordConf: '123',
  __v: 0
}
}
Success
profile
  passwordConf: '123'
}
if
Success
profile
```

```
profile
  passwordConf: '123'
}
if
Success
profile
data
{
  _id: new ObjectId("6367de5f7ed8932c44aca4dd"),
  unique_id: 8,
  email: 'nb@gmail.com',
  username: 'uj',
  password: '123',
  passwordConf: '123',
  __v: 0
}
[]
```

DATA

```
[
  {
    "_id": {
      "$oid": "62f1251cd401449d01dbc061"
    },
    "unique_id": 1,
    "email": "kumarujjawal1408@gmail.com",
    "username": "ujjawa",
    "password": "123",
    "passwordConf": "123",
    "__v": 0
  },
  {
    "_id": {
      "$oid": "62f125cfb8826c00b303b607"
    },
    "unique_id": 2,
    "email": "kumarujjawal1408@gmail.com",
    "username": "ujjawal",
    "password": "147",
    "passwordConf": "147",
    "__v": 0
  },
  {
    "_id": {
      "$oid": "62f12b24128cf8a0492ab412"
    },
    "unique_id": 3,
    "email": "abc@gmail.com",
```

```
"username": "ujjawal",
"password": "123",
"passwordConf": "123",
"__v": 0
},
{
  "_id": {
    "$oid": "62f1356f82efcb2fd28cb668"
  },
  "unique_id": 4,
  "email": "abc1@gmail.com",
  "username": "ujjawal",
  "password": "147",
  "passwordConf": "147",
  "__v": 0
},
{
  "_id": {
    "$oid": "62f1eca665f08f20c271b0cf"
  },
  "unique_id": 5,
  "email": "7abc1@gmail.com",
  "username": "ujjawal",
  "password": "123",
  "passwordConf": "123",
  "__v": 0
},
{
  "_id": {
    "$oid": "62f1ecef8bb10315f6cdc5"
  },
  "unique_id": 6,
  "email": "abc123@gmail.com",
  "username": "ujjawal tom",
  "password": "147",
  "passwordConf": "147",
  "__v": 0
},
{
  "_id": {
    "$oid": "62f29060af9455410d870d52"
  },
  "unique_id": 7,
  "email": "bc1@gmail.com",
  "username": "ujjawal tomcat",
  "password": "321",
  "passwordConf": "321",
  "__v": 0
```

```
},
{
  "_id": {
    "$oid": "6367de5f7ed8932c44aca4dd"
  },
  "unique_id": 8,
  "email": "nb@gmail.com",
  "username": "uj",
  "password": "123",
  "passwordConf": "123",
  "__v": 0
}
]
```