1. Simple HTTP Server Responding with "Hello, Students!"

```
const http = require('http');
const server = http.createServer((req, res) => {
  res.statusCode = 200;
  res.setHeader('Content-Type', 'text/plain');
  res.end('Hello, Students!');
});
server.listen(3000, () => {
  console.log('Server is running on port 3000');
});
```

Output:

Hello, Students!

2. Node.js Program to Read and Write to Files

```
const fs = require('fs');
fs.readFile('input.txt', 'utf8', (err, data) => {
  if (err) throw err;
  fs.writeFile('output.txt', data, (err) => {
    if (err) throw err;
    console.log('Content has been written to output.txt');
  });
});
```

Output:

Content has been written to output.txt

3. HTTP Server Handling Different Routes

```
const http = require('http');
const server = http.createServer((req, res) => {
  if (req.url === '/') {
    res.statusCode = 200;
    res.setHeader('Content-Type', 'text/plain');
    res.end('Hello, World!');
  } else {
    res.statusCode = 404;
    res.setHeader('Content-Type', 'text/plain');
    res.end('Page Not Found');
  }
```

```
});

server.listen(3000, () => {
    console.log('Server is running on port 3000');
});
```

Output:

```
Hello, World!
Page Not Found
```

4. Using the OS Module to Retrieve OS Information

```
const os = require('os');
console.log('Operating System:', os.type());
console.log('OS Platform:', os.platform());
console.log('CPU Architecture:', os.arch());
console.log('Free Memory:', os.freemem());
console.log('Total Memory:', os.totalmem());
console.log('Uptime (seconds):', os.uptime());
```

Output (Example):

```
Operating System: Linux
OS Platform: linux
CPU Architecture: x64
Free Memory: 3145738240
Total Memory: 17179869184
Uptime (seconds): 123456
```

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5. Using the Path Module to Manipulate File Paths

```
const path = require('path');
const filePath = '/users/students/code/file.txt';
console.log('Directory:', path.dirname(filePath));
console.log('Base Name:', path.basename(filePath));
console.log('File Extension:', path.extname(filePath));
const newPath = path.join(__dirname, 'newFolder', 'newFile.txt');
console.log('New File Path:', newPath);
```

Output:

```
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Directory: /users/students/code
```

Base Name: file.txt

File Extension: .txt

New File Path: /current/working/directory/newFolder/newFile.txt

6. Command-line Node.js Program (Basic Calculator)

```
const readline = require('readline');
const rl = readline.createInterface({
  input: process.stdin,
  output: process.stdout
});
rl.question('Enter the first number: ', (num1) => {
  rl.question('Enter the second number: ', (num2) => {
    rl.question('Enter the operation (+, -, *, /): ', (op) => {
      const n1 = parseFloat(num1);
      const n2 = parseFloat(num2);
      let result;
    switch (op) {
        case '+':
          result = n1 + n2;
          break;
        case '-':
          result = n1 - n2;
          break;
        case '*':
          result = n1 * n2;
          break;
        case '/':
          result = n1 / n2;
          break;
        default:
          console.log('Invalid operation');
          rl.close();
          return;
      }

      console.log(`Result: ${result}`);
      rl.close();
```

```
        });
    });
});
```

Output:

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```
Enter the first number: 5
Enter the second number: 3
Enter the operation (+, -, *, /): +
Result: 8
```