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Subject: Blockchain Technology

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Practical 2

Code:

```
const SHA256 = require("crypto-js/sha256");
class BlockCrypto {
  constructor(index, current_time, info, nextHash = " ") {
    this.index = index;
    this.current_time = current_time;
    this.info = info;
    this.nextHash = nextHash;
    this.hash = this.computeHash();
  }

  computeHash() {
    return SHA256(
      this.index +
      this.nextHash +
      this.current_time +
      JSON.stringify(this.info)
    ).toString();
  }
}

class Blockchain {
  constructor() {
    this.block1chain = [this.initGenesisBlock()];
    this.difficulty = 4;
  }
  initGenesisBlock() {
    return new BlockCrypto(0, "06/04/2021", "Initial Block in our network", "0");
  }

  obtainLatestBlock() {
    return this.block1chain[this.block1chain.length - 1];
  }
  addNewBlock(newBlock) {
    newBlock.nextHash = this.obtainLatestBlock().hash;
    newBlock.hash = newBlock.computeHash();
    this.block1chain.push(newBlock);
  }

  checkChainValidity() {
    for (let i = 1; i < this.block1chain.length; i++) {
      const currentBlock = this.block1chain[i];
```

```
const nextHash = this.block1chain[i - 1];

if (currentBlock.hash !== currentBlock.computeHash()) {
  return false;
}
if (currentBlock.nextHash !== nextHash.hash) return false;
}
return true;
}
}

let thecoin = new Blockchain();

console.log("thecoin mining progressing....");
thecoin.addNewBlock(
  new BlockCrypto(1, "06/04/2021", {
    sender: "Rabin Yitzack",
    recipient: "Loyd Eve",
    quantity: 20
  })
);

thecoin.addNewBlock(
  new BlockCrypto(2, "07/04/2022", {
    sender: "Anita Vyona",
    recipient: "Felix Mush",
    quantity: 349
  })
);

console.log(JSON.stringify(thecoin, null, 4));
```

Output:

CA Node.js command prompt

```
←[90m at Function.Module._load (internal/modules/cjs/loader.js:745:27)←[39m
←[90m at Function.executeUserEntryPoint [as runMain] (internal/modules/run_main.js:76:12)←[39m
←[90m at internal/main/run_main_module.js:17:47←[39m {
  code: ←[32m'MODULE_NOT_FOUND'←[39m,
  requireStack: []
}
```

H:\sem\_7\BCT\Lab 2>node bct2.js

thecoin mining progressing....

```
{
  "blockchain": [
    {
      "index": 0,
      "current_time": "06/04/2021",
      "info": "Initial Block in our network",
      "nextHash": "0",
      "hash": "8915d06549f9a1eaf7e0e9f1fb94e3825cc24bc369d6ee9cda510754eefedf46"
    },
    {
      "index": 1,
      "current_time": "06/04/2021",
      "info": {
        "sender": "Rabin Yitzack",
        "recipient": "Loyd Eve",
        "quantity": 20
      },
      "nextHash": "8915d06549f9a1eaf7e0e9f1fb94e3825cc24bc369d6ee9cda510754eefedf46",
      "hash": "59ccabf4a393456be80211755a2b810b2debbff367d75874f1d83f0c237c24a7"
    },
    {
      "index": 2,
      "current_time": "07/04/2022",
      "info": {
        "sender": "Anita Vyona",
        "recipient": "Felix Mush",
        "quantity": 349
      },
      "nextHash": "59ccabf4a393456be80211755a2b810b2debbff367d75874f1d83f0c237c24a7",
      "hash": "613617214ce3c7892de44b9f7db3bba57cb19364e19f5999a8c57b9f5b413182"
    }
  ],
  "difficulty": 4
}
```

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