MCQs

1. **Which of the following is not a valid type of MySQL Query? (easy)(crs-be-databases-api)**
    1. DML
    2. DQL
    3. DFL (Correct)
    4. DDL

2. **Why do our applications need external dependencies? (Medium) (crs-be-nodejs)**
    1. It is a norm to have external dependencies
    2. Without external dependencies our application won't run
    3. We need external dependencies if some feature is not inbuilt and is readily available via third-party packages (Correct)
    4. All of these

3. **What is the full form of MVC? (Easy) (crs-be-nodejs)**
    1. Model Viewer Center
    2. Multi View Controller
    3. Model View Center
    4. Model View Controller (Correct)

4. **What does MVC help us to achieve? (Medium) (crs-be-nodejs)**
    1. It provides us to define a solid distinction between database, apis and view(UI)
    2. It helps to make code cleaner, readable, manageable and easily debuggable.
    3. It supports rapid and parallel development
    4. All of these (Correct)

5. **What does ORM stands for? (Medium) (crs-be-nodejs)**
    1. Object Relative Map
    2. Object Relational Mapping (Correct)
    3. Object Relation Mask
    4. None of these

6. **Which of the following is true about Sequelize?**
    1. It is a promise based ORM
    2. It performs management version of the database
    3. It performs model mapping to database
    4. All of the above (Correct)

7. **Which of the following is true about Middlewares in Nodejs? (Medium) (crs-be-nodejs)**
    1. Middlewares are executed in the order they are specified in the code
    2. Middlewares can terminate the request
    3. Both a and b

4. Only a (Correct)

8. How does the request flow in MVC architecture? (Difficult) (crs-be-nodejs)

1. Server sends request to the client controller, request is redirected to database to query for data and forms the data model and then the appropriate view renders the output.
2. Browser sends request to the MVC application, the request is redirected to the controller, controller processes the request and forms the data model, the model is then passed to the view, finally the view renders the output. (Correct)
3. Browser sends request to the MVC application, the request first forms the data model and controller processes the request and runs business logic using data model, finally view renders the output.
4. There is no such specific standard flow for MVC architecture.

9. From which directory do we usually serve static files? (Easy) (crs-be-nodejs)

1. public (Correct)
2. static
3. html
4. None of them

10. Which of the following is not a valid aggregate function in MySQL? (Medium)(crs-be-databases-api)

1. SUM()
2. MEAN() (Correct)
3. MAX()
4. COUNT()

11. Which of the following statements is true about ORM? (Medium)(crs-be-nodejs)

1. ORM stands for Object Relational Mapping
2. It allows mapping of the software objects into the tables of a database and perform CRUD through those objects
3. Only a
4. Both a and b (Correct)

12. What are limitations of File Systems over Database? (Medium) (crs-be-nodejs)

1. Data Inconsistency
2. Data Redundancy
3. Data Sharing
4. All of the above (Correct)

13. What is the correct format to specify params in the api route? (Easy) (crs-be-nodejs)

1. /api/:id/person (correct)
2. /api/$id/person
3. /api/&id/person
4. None of these

14. What is the correct sql query to return results sorted by highest to lowest price? (Medium) (crs-be-database-api)

1. Select * from product;
2. Select * from product order by price;
3. Select * from product order by price descending;
4. Select * from product order by price desc; (Correct)

15. How do we send status code in the response? (Medium) (crs-be-nodejs)

1. response.send(200)
2. response.status(200).send("text") (Correct)
3. response.send({status:200})
4. All of these

16. Which of the following is best practice to store passwords in the database? (Easy) (crs-be-database-api)

1. Hash the password and store it (correct)
2. Store it in plain text
3. Reverse the password and store it
4. Both a and c

17. Middlewares receive which of the following objects as parameters? (easy) (crs-be-javascript)

I. request
II. response
III. next

1. Only I and II
2. Only I
3. I, II and III (Correct)
4. Only II

18. In MVC architecture, the model defines :

1. Presentation Layer
2. Interface Layer
3. Business Logic Layer (Correct)
4. Data Access Layer

19. How can you check the Express version used in your app? (Easy) (crs-be-nodejs)

1. node -v express
2. npm express -v
3. From package.json (Correct)
4. Not possible to check

20. Suppose you are running a node app on port 8000, and you tried to start one more app on the same port,what will happen? (Medium) (crs-be-javascript)

1. Both app will run without any issue
2. First app will stop and second one will start

3. Second app wont start due to busy port (Correct)
4. None of these

21. What is the significance of the code snippet below? (Difficult) (crs-be-nodejs)

```
app.listen(3333, () => {
  //callback
});
```

1. It does nothing
2. Used to bind and listen to the requests coming on port 3333 (Correct)
3. It calls the callback function after every 3333 seconds
4. It calls the callback function after every 3333 incoming requests

22. Which of the following statement is true about ORM? (Difficult) (crs-be-nodejs)

I. ORM helps to implement the principle of Do Not Repeat Yourself.
II. ORM is the process of mapping between objects and relational database systems
III. ORM cannot handle the passage of data between different databases.

1. Only b and c
2. Only a and b (Correct)
3. Only a
4. None of the above

23. Why do we need to pass a callback to app.listen(port,callback) function? (Medium) (crs-be-nodejs)

1. To perform some operation on startup
2. It is optional to pass and can be ignored (Correct)
3. It is a syntax and we need to follow
4. None of these

24. Which of the following is responsible for organizing the data from the database in MVC?

1. Model (Correct)
2. View
3. Controller
4. None of the above

25. What is the correct query to update columns? (Difficult) (crs-be-database-api)

1. UPDATE column1 = value1, column2 = value2, ...
   IN table_name
   WHERE condition
2. Select from table_name
   WHERE condition
   SET column1 = value1, column2 = value2, ...
3. Select from table_name
   SET column1 = value1, column2 = value2, ...
   WHERE condition
4. UPDATE table_name

SET column1 = value1, column2 = value2, ...
WHERE condition (Correct)

26. Which of the promise methods resolves only when all of the given promises get resolved or else get rejected when any of them fails? (Difficult) (crs-be-javascript)

1. Promise.allSettled
2. Promise.all (Correct)
3. Promise.any
4. None of these

27. How can we access the params from the request object? (Medium) (crs-be-nodejs)

1. request.parameters
2. request.arguments
3. request.params (Correct)
4. request.param

28. What HTTP verb should be used for passing private data like user credentials? (Medium) (crs-be-nodejs)

1. HEAD
2. POST (Correct)
3. GET
4. TRACE

29. What flow do we follow while creating a database for our app? (Difficult) (crs-be-database-api)

1. Mark foreign key relationships among entities
2. Decide the list of all entities required
3. Figure out relations between all entities

1. 1, 3 and 2
2. 2, 3 and 1 (Correct)
3. 3, 2 and 1
4. 1, 2 and 3

30. What is the correct sql query to return the first 10 results? (Medium) (crs-be-database-api)

1. Select * from product size 10;
2. Select * from product limit 10; (Correct)
3. Select * from product count 10;
4. None of these

Round 2

1. Sort By Frequency

Problem Statement

Given an array of integers nums, sort the array in increasing/ascending order based on the frequency of the elements. If multiple elements have the same frequency, sort them in decreasing order.

Return the sorted array.

Constraint

• 1 <= nums.length <= 100
• -100 <= nums[i] <= 100

Input Format

• Space separated integers

Output Format

• Sorted array based on frequency of elements

Sample Input 1

1 1 2 2 2 3

Sample Output 1

3 1 1 2 2 2

Explanation of Sample 1

'3' has a frequency of 1, '1' has a frequency of 2, and '2' has a frequency of 3.

Sample Input 2

2 3 1 3 2

Sample Output 2

1 3 3 2 2

Explanation of Sample 2

'2' and '3' both have a frequency of 2, so they are sorted in decreasing order.

Sample Input 3

-1 1 -6 4 5 -6 1 4 1

Sample Output 3

5 -1 4 4 -6 -6 1 1 1

Explanation of Sample 3

'5' and '-1' both have a frequency of 1, so they are sorted in decreasing order. Similarly for '4' and '-6'. '1' has frequency of 3

Solution:

```
let arr = readline().split(" ").map(x => parseInt(x));

function frequencySort(arr)
```

```
{
        let freq = {};
    for(let ele of arr){
        if(!!freq[ele]) freq[ele]++;
        else freq[ele] = 1;
        }

    arr.sort((a, b) => {
        if(freq[a] == freq[b]) return b - a;
        return freq[a] - freq[b]
        });

        return arr;
}

console.log(frequencySort(arr).join(" "));
```

Template:

```
let arr = readline().split(" ").map(x => parseInt(x));

function frequencySort(arr)
{
        //write your logic here, return the output. Do not print anything
}

console.log(frequencySort(arr).join(" "));
```

2 . Wealthy Customer

Problem Statement

You are given an m x n integer grid accounts where accounts[i][j] is the amount of money the i^{th} customer has in the j^{th} bank. Return the wealth that the richest customer has.

A customer's wealth is the amount of money they have in all their bank accounts. The richest customer is the customer that has the maximum wealth.

Constraint

- **m == accounts.length**
- **n == accounts[i].length**
- **1 <= m, n <= 50**
- **1 <= accounts[i][j] <= 100**

Input Format

- The first line of input consists of a m and n as integer value
- The m lines of input consists n space separated integers

Output Format

• Return the wealth customer position (starting from 1)

Sample Input 1

2 3
1 1 4
2 2 3

Sample Output 1

2

Explanation of Sample 1

1st customer has wealth = 1 + 1 + 4 = 6
2nd customer has wealth = 2 + 2 + 3 = 7
The 2nd customer is the richest with a wealth of 7.

Sample Input 2

3 2
1 5
5 3
3 7

Sample Output 2

3

Explanation of Sample 2

1st customer has wealth = 6
2nd customer has wealth = 8
3rd customer has wealth = 10
The 3rd customer is the richest with a wealth of 10.

Sample Input 3

2 3
1 2 3
3 2 1

Sample Output 3

1

Explanation of Sample 3

1st customer has wealth = 1 + 2 + 3 = 6
2nd customer has wealth = 3 + 2 + 1 = 6
Both customers are considered the richest with a wealth of 6 each, so return 1 (return the latest i.e. minimum position).

Solution:

```
let [m, n] = readline().split(" ").map(x => parseInt(x));
let accounts = [];
for(let i = 0; i < m; i++){
        let arr = readline().split(" ").map(x => parseInt(x)).slice(0, n);
```

```
        accounts.push(arr);
}

function wealthyCustomer(accounts, m, n)
{
        let maxWealthSoFar = 0;
        let wealthyCustomer = -1;
        for (let i = 0; i < accounts.length; i++) {
        let currCustomerWealth = 0;
        for (let money of accounts[i]) {
        currCustomerWealth += money;
        }
        if(maxWealthSoFar < currCustomerWealth){
        wealthyCustomer = i + 1;
        maxWealthSoFar = currCustomerWealth;
        }
        }
        return wealthyCustomer;
}

console.log(wealthyCustomer(accounts, m, n))
```

Template:

```
let [m, n] = readline().split(" ").map(x => parseInt(x));
let accounts = [];
for(let i = 0; i < m; i++){
        let arr = readline().split(" ").map(x => parseInt(x)).slice(0, n);
        accounts.push(arr);
}

function wealthyCustomer(accounts, m, n)
{
        //write your logic here
}

console.log(wealthyCustomer(accounts, m, n));
```

Round 3:

1. **Create**

Create a Quiz App. There will be 20 questions in the quiz. Questions will also be shuffled in every quiz i.e. the ordering of questions should be different in every quiz. The result should be declared once the test is submitted by the user. Based on marks scored, user will get remarks

20-18 Excellent
15-17 Very Good
12-14 Good
7-11 Fair
0-6 Fail

For randomizing the questions, you can use Math.random() function and since there are 20 questions you can use Math.floor(Math.random() * 20) to get a random index and change the order. You can also use array.splice() method to add or delete element

To delete element at index 4 -> some_array.splice(4, 1) -> where 4 is the index, 1 is the count of elements to be deleted

To insert an element at some random index, suppose at index 18 -> some_array.splice(18, 0, element_to_be_inserted) -> here 18 is index, 0 is count of element to be deleted and element_to_be_inserted as name suggest which you want to insert

Hint: You may return a function that will accept the answers array
For eg.
let answerFunc = quizApp(); // this function call will print all the questions. Each this function is called, questions will be printed in random order

answerFunc([3, 2, 2, 2, 3, 1, 1, 2, 3, 4, 1, 2, 3 , 4, 2, 3, 3, 3, 2, 1]); // this will check the answer and print the results

/* Output:
You scored 4 marks
Fail
*/

2. **Enhancement**

Implement pagination, each page should show only 5 questions and on next pagination call the next set of 5 unrepeated questions should be fetched

You may design your function as below

let func = quizApp(); // initialise questionset in random order everytime it is called and returns a object with next function
let answerFunc = func.next(); // next will print 5 question set and return a function to accept input for that question set
answerFunc([3, 2, 2, 2, 3]); // this will check the answer and on last call print the result
answerFunc = func.next(); // next will print next 5 question set and return a function to accept input for that question set
answerFunc([1, 1, 2, 3, 4]);
answerFunc = func.next(); // next will print next 5 question set and return a function to accept input for that question set
answerFunc([1, 2, 3 , 4, 2]);
answerFunc = func.next(); // next will print next 5 question set and return a function to accept input for that question set
answerFunc([3, 3, 3, 2, 1]); // this will check the answer and will print the result

Q&A below in JSON Format

```
let questions = [
  {
      "id": 1,
    "question":"What does CPU stand for?",
    "options":[
          "Central Process Unit",
          "Central Processing Unit",
          "Computer Personal Unit",
          "Central Processor Unit"
          ],
    "answer":2
  },
  {
      "id": 2,
    "question":"What does the “MP” stand for in MP3?",
    "options":[
          "Music Player",
          "Moving Picture",
          "Multi Pass",
          "Micro Point"
          ],
    "answer":2
  },
  {
      "id": 3,
    "question":"What was the name of the security vulnerability found in Bash in 2014?",
    "options":[
```

```
        "Heartbleed",
        "Bashbug",
        "Shellshock",
        "Stagefright"
        ],
    "answer":3
  },
  {
     "id": 4,
    "question":"What does AD stand for in relation to Windows Operating Systems? ",
    "options":[
        "Active Directory",
        "Alternative Drive",
        "Automated Database",
        "Active Department"
        ],
    "answer":1
  },
  {
     "id": 5,
    "question":"HTML is what type of language?",
    "options":[
        "Macro Language",
        "Markup Language",
        "Programming Language",
        "Scripting Language"
        ],
    "answer":2
  },
  {
     "id": 6,
    "question":"The internet domain .fm is the country-code top-level domain for which Pacific Ocean island nation?",
    "options":[
        "Fiji",
        "Micronesia",
        "Tuvalu",
        "Marshall Islands"
        ],
        "answer":2
  },
  {
     "id": 7,
    "question":"While Apple was formed in California, in which western state was Microsoft founded?",
```

```
  "options":[
        "New Mexico",
        "Washington",
        "Colorado",
        "Arizona"
        ],
  "answer":1
},
{
    "id": 8,
  "question":"In the server hosting industry IaaS stands for...",
  "options":[
        "Infrastructure as a Service",
        "Internet as a Service",
        "Internet and a Server",
        "Infrastructure as a Server"
        ],
  "answer":1
},
{
    "id": 9,
  "question":"Who is the original author of the realtime physics engine called PhysX?",
  "options":[
        "Ageia",
        "Nvidia",
        "NovodeX",
        "AMD"
        ],
  "answer":3
},
{
    "id": 10,
        "question":"Which operating system was released first?",
  "options":[
        "Windows",
        "Linux",
        "Mac OS",
        "OS/2"
        ],
  "answer":3
},
{
    "id": 11,
  "question":"Which of the following is a personal computer made by the Japanese company Fujitsu?",
```

```
  "options":[
        "PC-9801",
        "FM-7",
        "Xmillennium ",
        "MSX"
        ],
  "answer":2
},
{
    "id": 12,
  "question":"Which data structure does FILO apply to?",
  "options":[
        "Queue",
        "Heap",
        "Stack",
        "Tree"
        ],
  "answer":3
},
{
    "id": 13,
  "question":"What internet protocol was documented in RFC 1459?",
  "options":[
        "HTTP",
        "IRC",
        "HTTPS",
        "FTP"
        ],
  "answer":2
},
{
    "id": 14,
  "question":"How many values can a single byte represent?",
  "options":[
        "8",
        "256",
        "1",
        "1024"
        ],
  "answer":2
},
{
    "id": 15,
  "question":"How many bytes are in a single Kibibyte?",
```

```
  "options":[
        "1024",
        "2400",
        "1000",
        "1240"
        ],
  "answer":1
},
{
    "id": 16,
  "question":"According to DeMorgan's Theorem, the Boolean expression (AB)' is equivalent to:",
  "options":[
        "A'B + B'A",
        "A' + B'",
        "A'B'",
        "AB' + AB"
        ],
  "answer":2
},
{
    "id": 17,
  "question":"Which of these is not a layer in the OSI model for data communications?",
  "options":[
        "Application Layer",
        "Connection Layer",
        "Transport Layer",
        "Physical Layer"
        ],
  "answer":2
},
{
    "id": 18,
  "question":"What type of sound chip does the Super Nintendo Entertainment System (SNES) have?",
  "options":[
        "ADPCM Sampler",
        "FM Synthesizer",
        "Programmable Sound Generator (PSG)",
        "PCM Sampler"
        ],
  "answer":1
},
{
    "id": 19,
  "question":"How many bits make up the significant portion of a single precision floating point number?",
```

```
    "options":[
        "8",
        "23",
        "53",
        "15"
        ],
    "answer":2
  },
  {
     "id": 20,
    "question":"What is the codename of the eighth generation Intel Core micro-architecture launched in October 2017?",
    "options":[
        "Coffee Lake",
        "Sandy Bridge",
        "Skylake",
        "Broadwell"
      ],
    "answer":1
  }
]
```

Solution:
Round 3:

```
function quizApp(){
        let selectedQuestions = new Set();
        let questionSet = [];
        for(let i = 0; i < 20; i++){
                let index =     Math.floor(Math.random() * 20);
                while(selectedQuestions.has(index)){
                  index =       Math.floor(Math.random() * 20);
                }
                selectedQuestions.add(index);
                console.log((i+1) + ". " + questions[index].question);
        let charCode = 97;
      questions[index].options.map(op => {
        console.log("    " + String.fromCharCode(charCode++) + ". " + op);
        })

                questionSet.push(questions[index]);
        }
        return function(answersArray){
```

```
        let marks = 0;
        for(let i = 0; i < 20; i++){
                if(questionSet[i].answer == answersArray[i]){
                marks++;
                }
        }
        console.log("You scored " + marks + " marks");
        if(marks >= 18) console.log("Excellent");
        else if(marks >= 15) console.log("Very Good");
        else if(marks >= 12) console.log("Good");
        else if(marks >= 7) console.log("Fair");
        else console.log("Fail");
        }
}

/*
let answerFunc = quizApp();
answerFunc([3, 2, 2, 2, 3, 1, 1, 2, 3, 4, 1, 2, 3 , 4, 2, 3, 3, 3, 2, 1])
*/
```

Round 3:
Enhancement

```
function quizApp(){
        let selectedQuestions = new Set();
        let questionSet = [];
        for(let i = 0; i < 20; i++){
                let index =     Math.floor(Math.random() * 20);
                while(selectedQuestions.has(index)){
                  index =       Math.floor(Math.random() * 20);
                }
                selectedQuestions.add(index);
                questionSet.push(questions[index]);
        }
        let index = 0;
        let marks = 0;
        return {
        next: function() {
                for(let i = index; i < index + 5; i++){
                console.log((i+1)+ ". " + questionSet[i].question);
                let charCode = 97;
                questionSet[i].options.map(op => {
                        console.log("    " + String.fromCharCode(charCode++) + ". " + op);
```

```
                })
                console.log(" ");
                }

                return function(answersArray){
                        for(let i = index; i < index + 5; i++){
                        if(questionSet[i].answer == answersArray[i - index]){
                        marks++;
                        }
                }
                index = index + 5;
                if(index == 20){
                        console.log("You scored " + marks + " marks");
                        if(marks >= 18) console.log("Excellent");
                        else if(marks >= 15) console.log("Very Good");
                        else if(marks >= 12) console.log("Good");
                        else if(marks >= 7) console.log("Fair");
                        else console.log("Fail");
                }
                }
        }
        }
}

/*
let func = quizApp();
let answerFunc = func.next();
answerFunc([3, 2, 2, 2, 3]);
answerFunc = func.next();
answerFunc([1, 1, 2, 3, 4]);
answerFunc = func.next();
answerFunc([ 1, 2, 3 , 4, 2]);
answerFunc = func.next();
answerFunc([3, 3, 3, 2, 1]);


Output:
You scored 7 marks
Fair

*/
```