Problem Solving - If Else

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List of Problems Involved

- Voting Age
- Increasing or Decreasing Order
- Largest among Three Numbers
- Grading System
- Minimum Lectures to achieve 75%
- Quadratic Equation

Voting Age

Problem – Given a number age. You need to find if that age is coming under voting age. Age can be considered as the voting age if it is greater than 18. For example –

Input – 25

Output – true

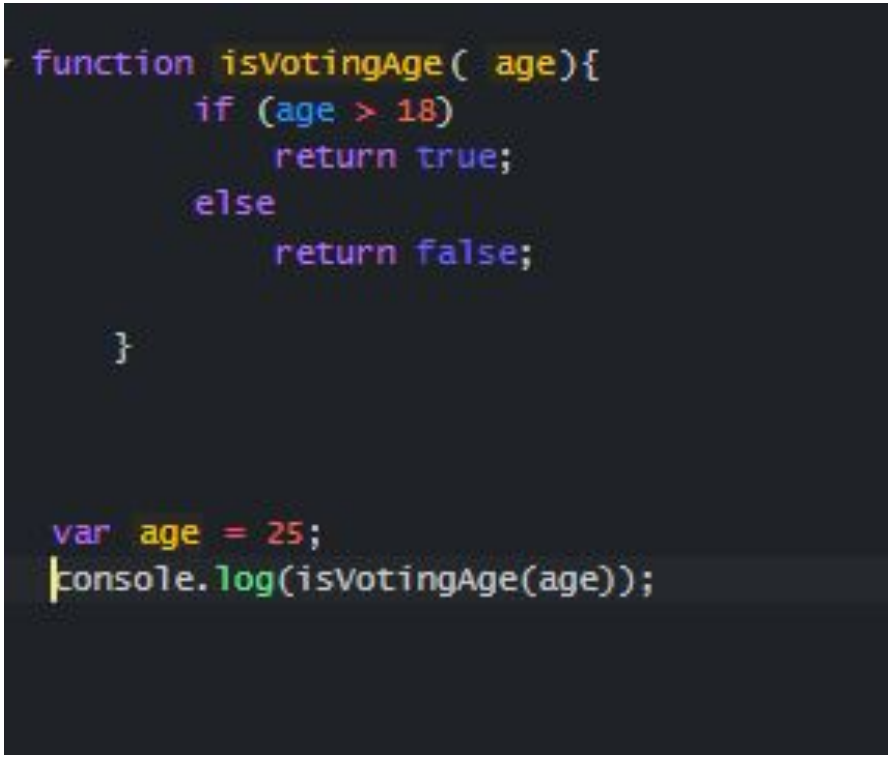
Approach – Since this problem is based on one specific condition, we can go with the If else block.

Steps -

1) Take input as age
2) Check if age > 18 - return true
3) Else return false

Voting Age

Code Link - https://jsfiddle.net/bsnfdmc8/



Increasing or Decreasing Order

Problem – Given three numbers. Your task is to check the order of three numbers. If they are in increasing order, print “Increasing order”. If they are in decreasing order, print “Decreasing Order” else print “neither increasing or decreasing order”

For example –

Input – 12, 45, 87

Output – Increasing order

Approach – Since this problem is based on condition, we can go with the If else block.

Steps -

1) Take three numbers as input a,b,c
2) If a>b and b>c - print “Decreasing order”
3) If a<b and b<c - print “Increasing order”
4) Else print “Neither increasing or decreasing order”

Increasing or Decreasing Order

Code Link - https://jsfiddle.net/bsnfdmc8/1/

```
var a = 25;
var b = 34;
var c = 42;
if (a < b && b < c)
{
    console.log("Increasing order");
}
else if (a > b && b > c)
{
    console.log("Decreasing order");
}
else
{
    console.log("Neither increasing or decreasing order");
}
```

Largest among Three numbers

Problem – Given an array of three numbers. You need to find the largest among the three numbers. For example –

Input – 25, 15, 20

Output – 25

Approach – Compare the first 2 numbers and then compare the largest of these 2 with the third number to get the largest amongst the 3 given numbers. For comparison, we will use If else if ladder.

Steps -

1) Take input as three numbers A, B, and C
2) Verify if A is greater than B
3) If 2nd step is true, verify if A is greater than C
4) If true, print A as output
5) Else C as output
6) If 2nd step is false, verify if B is greater than C
7) If true, print B as output
8) Else C as output

Largest among Three numbers

Code Link - https://jsfiddle.net/2L4ywq9g/

```
function largestOfThree(x, y, z) {
  // Compare all 3 numbers
  if (x >= y && x >= z)

    // Return 1st number if largest
    return x;

  // Comparing 2nd no with 1st and 3rd no
  else if (y >= x && y >= z)
    return y;

  else
    // Return 3rd no, Its sure it is greatest
    return z;
}


var a, b, c, largest;

a = 15;
b = 10;
c = 30;

largest = largestOfThree(a, b, c);


console.log(largest +
  " is the largest number");
```

Grading System

Problem – Given a number as a score of the student. You need to assign the grade to the studen based on the score

Grading system followed -

90 and above	A
80 to 89	B
60 to 79	C
33 – 59	D
below 33	F

Intuition - As per the grading system, we will assign the grade to the student using conditional statement - nested if-else ladder

Steps -

1. Take input score
2. Initialize grade
3. Implement a nested if-else ladder to find the grade based on the value of score

Grading System

Code Link - https://jsfiddle.net/ob3sme9a/

```
var score = 35;
var grade = 'F';
// Nested if else
if (score >= 90) {
  grade = 'A';
} else {
  if (score >= 80 && score <= 89) {
    grade = 'B';
  } else {
    if (score >= 60 && score <= 79) {
      grade = 'C';
    } else {
      if (score >= 33 && score <= 59) {
        grade = 'D';
      } else {
        grade = 'F';
      }
    }
  }
}
console.log(grade);
```

Minimum Lectures to achieve 75%

Problem –Given 2 numbers M and N where

M = number of lectures happened

N = number of lectures attended

Your task is to find number of lectures which need to be attended to achieve 75% attendance

For example –

Input – M = 7, N = 6

Output – 0 (75% attendance already achieved)

Approach – Since this problem is based on a specific condition where we need to check if attendance is 75% or not, we can go with the If else statements.

Steps -

1) Check whether N/M * 100 >= 75%
2) If not, use formula - Ceil ((0.75*M) - N) / 0.25 to get output0

Minimum Lectures to achieve 75%

Code Link - https://jsfiddle.net/wsycuxt3/

```
function minimumLectures(m, n)
{
  let ans = 0;

  // Formula to compute
  if (n < Math.ceil(0.75 * m))
    ans = Math.ceil(((0.75 * m) - n) / 0.25);
  else
    ans = 0;

  return ans;
}

let M = 7, N = 6;
console.log(minimumLectures(M, N));
```

Quadratic Equation

Problem – Given three numbers as a.b and c. Your task is to solve quadratic equation and find the roots.

Quadratic Equation - $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

We will follow below scenario -
If (b*b - 4*a*c) = 0 then root = -b/2*a
Else If (b*b - 4*a*c) > 0 then root = $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Else "no roots found"

For example –
Input – 1,5,1
Output – -0.4384471871911697 , -4.561552812808831

Approach – Based on the given scenario, we will use if else block to check the condition and print the output

Steps -

1) Take input as three numbers A, B, and C
2) Calculate result = b*b - 4*a*c

Based on the result value, follow scenario points

Quadratic Equation

Code Link - https://jsfiddle.net/qk4m8j2w/

```
var a = 1;
var b = 5;
var c = 1;

var result = b * b - 4.0 * a * c;

if (result > 0.0) {
  var r1 = (-b + Math.pow(result, 0.5)) / (2.0 * a);
  var r2 = (-b - Math.pow(result, 0.5)) / (2.0 * a);
  console.log("The roots are " + r1 + " and " + r2);
} else if (result == 0.0) {
  var r1 = -b / (2.0 * a);
  console.log("The root is " + r1);
} else {
  console.log("no real roots.");
}
```

MCQ Questions

1) What is the conditional expression called?

A..Immediate if statement [Correct Answer]

B.If then else statement

C.Switch

D.None

2.) Let's say we want the printing of a word 15 times. Which for loop will help you achieve the same ?

A. for(int iterator = 1; iterator < 15; iterator++){}

B. for(int iterator = 0; iterator <=15; iterator++){}

C. for(int iterator = 0; iterator <15; iterator++){} [Correct Answer]

D. for(int iterator = 0; iterator >15; iterator++){}

3.) What is the output of below code?

```
int counter = 10;
 if(counter <= 5){
     System.out.println(counter);
     counter++;
 }else{
     System.out.println(counter);
     counter--;
 }
```

A. 10 [Correct Answer]

B. 11

C. 9

D. None

4) Which is a valid conditional statement?

A) else [Correct answer]
B) If else
C) elseif
D) None

5) What is the output of the following code snippet?

```
String s1 = "Hello";
String s2 = new String("Hello");
System.out.println(s1 == s2);
```

A) false [Correct Answer]
B) true
C) null
D) None

Practice Questions

1) Given a positive integer A, find a pair of integers a, b such that
   - a and b are positive
   - A <= B
   - a^2 + b^2 = A
   - 0<=A<=100000
1) Create a program to print all the palindromes under 50.

THANK YOU