**Problem 1**

if the number is even and less than 15, print a

if the number is even and more than 15, print b

if the number is odd and less than 10, print c

if the number is odd and more than 10, print d

We need to solve this using two methods

**i.using nested if else**

*const* number = 23;

if (number % 2 == 0) {

  if (number < 15) {

    console.log("a");

  }

  if (number > 15) {

    console.log("b");

  }

} else {

  if (number < 10) {

    console.log("c");

  }

  if (number > 10) {

    console.log("d");

  }

}

**ii.using logical operators**

number % 2 == 0 && number < 15 && console.log("a");

number % 2 == 0 && number > 15 && console.log("b");

number % 2 != 0 && number < 10 && console.log("c");

number % 2 != 0 && number > 10 && console.log("d");

**Problem 2**

**Result**

**answer should be: "Hi, my name is Farheena"**

**we need to solve this using for loop**

**Solved using three methods**

**First Method:**

*//Printing using For loop and Arrays*

*const* arr = ["Hi,", "my", "name", "is", "deepak"];

*const* newArr = [];

for (i = 0; i < arr.length; i++) {

  newArr.push(arr[i]);

}

console.log('"', ...newArr, '"');

**Second Method:**

*// Printing using for loop and global variable var*

for (*let* i = 0; i < 5; i++) {

  if (i < 1) {

*var* a = "Hi,";

  } else if (i < 2) {

*var* b = "my";

  } else if (i < 3) {

*var* c = "name";

  } else if (i < 4) {

*var* d = "is";

  } else if (i < 5) {

*var* e = "Deepak";

    console.log('"', a, b, c, d, e, '"');

  }

}

**Third Method:**

*//printing using local variable let*

*let* a, b, c, d, e;

for (*let* i = 0; i < 5; i++) {

  if (i < 1) {

    a = "Hi,";

  } else if (i < 2) {

    b = "my";

  } else if (i < 3) {

    c = "name";

  } else if (i < 4) {

    d = "is";

  } else if (i < 5) {

    e = "Deepak";

    console.log('"', a, b, c, d, e, '"');

  }

}

**Problem 4**

**create a variable called myName and store your name inside it.**

**then, add Mr./Miss. before it and store the result in**

**a new variable with the same name i.e. myName.**

{

*const* myName = "deepak";

*var* name = "Mr " + myName;

}

{

*const* myName = name;

  console.log(myName);

}

**Problem 5**

**Find sum and multiplication of all natural numbers from 10 to 20**

*// Find sum and multiplication of all natural numbers from 10 to 20*

*let* multAnswer = 1;

for (*let* i = 10; i <= 20; i++) {

  multAnswer \*= i;

}

console.log(multAnswer);

**Problem 6**

**Check whether a given year is a leap year**

**create a variable and store a random year in it**

**now write code, which should return true or false, depending whether the value in the above variable is leap year or not**

**First Method: Using if else**

*const* year = 2100;

if (year % 4 == 0) {

  if (year % 100 == 0) {

    if (year % 400 == 0) {

      console.log(true);

    } else {

      console.log(false);

    }

  } else {

    console.log(true);

  }

} else {

  console.log(false);

}

**Second Method: Using logical operators**

*const* isLeapYear = (year % 4 == 0 && year % 100 != 0) || year % 400 == 0;

console.log(isLeapYear);

**Problem 7**

**find the area of a triangle. Lengths of its sides are 5, 6, 7**

*function* findAreaOfTriangle(*a*, *b*, *c*) {

*const* semiPerimeter = (a + b + c) / 2;

*const* areaOfTriangle = Math.sqrt(

    semiPerimeter \*

      (semiPerimeter - a) \*

      (semiPerimeter - b) \*

      (semiPerimeter - c)

  );

  console.log(areaOfTriangle);

}

findAreaOfTriangle(5, 6, 7);

**Problem 8**

**create two variables and store numbers in them.**

**Now, write code, which return true if one of the variable is 50 or if their sum is 50.**

**Otherwise, you need to return false.**

**Also handle edge cases**

**(in real world, these two numbers will be supplied by the users.**

**Now think what if they supply something which is not a number ?)**

*const* num1 = 10;

*const* num2 = 50;

if (typeof num1 == "number" && typeof num2 == "number") {

  if (num1 == 50 || num2 == 50 || num1 + num2 == 50) {

    console.log(true);

  } else {

    console.log(false);

  }

} else {

  console.log("Please type a number");

}

**Problem 9**

**create a variable and store a number inside it**

**write program to check whether a given variable is between 100 and 200**

**write program to check whether a given variable is between 100 and 200 or 400 and 500**

**handle edge cases**

*const* number = 450;

if (typeof number == "number") {

  if (number > 100 && number < 200) {

    console.log("Number is between 100 and 200");

  } else {

    if (number === 100) {

      console.log("number is 100");

    }

    if (number < 100) {

      console.log("number is less than 100");

    }

    if (number === 200) {

      console.log("number is 200");

    }

    if (number > 200) {

      console.log("number is greater than 200");

    }

  }

} else {

  console.log("Not a Number");

}

if (typeof number == "number") {

  if (number > 100 && number < 500) {

    if (number < 200) {

      console.log("number is between 100 and 200");

    }

    if (number > 400) {

      console.log("number is between 400 and 500");

    }

  }

} else {

  console.log("not a number");

}

**Problem 10**

**you have 3 numbers.**

**write a program which can find the largest number**

**First Method:**

*function* findLargestNumber(*a*, *b*, *c*) {

  if (a > b && a > c) {

    console.log(a, "is largest number");

  } else if (b > a && b > c) {

    console.log(b, "is largest number");

  } else if (c > a && c > b) {

    console.log(c, "is largest number");

  }

}

findLargestNumber(5, 15, 20);

**Second Method:**

*function* findLargestNumber(*a*, *b*, *c*) {

  a > b && a > c ? console.log(a, " is largest") : false;

  b > a && b > c ? console.log(b, " is largest") : false;

  c > a && c > b ? console.log(c, " is largest") : false;

}

findLargestNumber(5, 15, 20);

**Third Method:**

*function* findLargestNumber(...*a*) {

  for (*let* i = 0; i < a.length; i++) {

    if (a[0] < a[i]) {

      a[0] = a[i];

    }

  }

  console.log(a[0]);

}

findLargestNumber(5, 10, 20);

**Fourth Method:**

*function* findLargestNumber(...*a*) {

*const* sort = a.sort(*function* (*a*, *b*) {

    return a - b;

  });

  console.log(sort[sort.length - 1]);

}

findLargestNumber(5, 10, 20, 9, 5, 8);

**Problem 11**

**create two variables and assign numbers to them**

**now write a code which returns true if one of them is 8 or their sum or difference is 8. Otherwise**

**it should return false**

*const* num1 = 8;

*const* num2 = 18;

*const* check =

  num1 == 8 ||

  num2 == 8 ||

  num1 + num2 == 8 ||

  num1 - num2 == 8 ||

  num2 - num1 == 8;

console.log(check);