BMI

Write a Java program that calculates and classifies the Body-Mass-Index (BMI).

Introduction

The BMI is an attempt to quantify the amount of tissue mass (muscle, fat, and bone) in an individual, and then categorize that person as underweight, normal weight, overweight, or obese based on that value.The BMI is defined as the body mass (m) divided by the square of the body height (h), and is universally expressed in units of kg/m^2, resulting from mass in kilograms and height in meters.

$BMI = m/h^2$

Your program shall treat heights below 1.6m and weights below 40kg as invalid.

Table 1: BMI categories and numbers

BMI $[kg/m^2]$	**Category**	**Category-Number**
< 15.00	Very severely underweight	10
>=15.00 and <16.00	Severely underweight	11
>=16.00 and <18.50	Underweight	12
>=18.50 and <25.00	Normal	20
>=25.00 and <30.00	Overweight	30
>=30.00 and <35.00	Moderately obese	40
>=35.00 and <40.00	Severely obese	41
>= 40.00	Very severely obese	42

Implement the following functions in class `BMI.Main`:

1. `public static double bmiCalc(double height, double weight)`

   calculates the BMI for given height and weight. Height is assumed to be in meters and weight in kilograms, the returned BMI is in kg/m^2. For invalid arguments (too low) the function returns -1.

2. `public static int bmiCategory(double bmi)`

   calculates BMI category for given bmi according to above table. For invalid arguments (negative bmi) the function returns -1.

3. `public static void bmiMessage(int bmiCategory)`

   outputs the category name of given bmiCategory according to above table. For invalid arguments the function outputs `invalid`.

The main functions prompt the user for weight and height, displays the BMI and the category name (see Examples).

Console Example

(text in red is user input)

```
weight [kg]: 121.5
height [m]: 1.96
m=121.50kg h=1.96m -> BMI=31.63 (Moderately obese)
```

```
weight [kg]: 25
height [m]: 1.16
m=25.00kg h=1.16m -> BMI=-1.00 (invalid)
```

Hint

use the `main` function in the provided `Main` class for testing (see and rename file `Main.use_this`):

```
public static void main(String[] args) {
    double weight, height, bmi;
    System.out.printf("weight [kg]: ");
    weight = sc.nextDouble();
    System.out.printf("height [m]: ");
    height = sc.nextDouble();
    System.out.printf("m=%.2fkg h=%.2fm -> BMI=%.2f (", weight, height, bmi = bmiCalc(height, weig
    bmiMessage(bmiCategory(bmi));
    System.out.printf(")\n");
}
```