**Scenario 1:**

Consider the scenario of processing marks of a student John for a course as part of a student management system. The assumption is that John takes exams in five different subjects. Find out the grade scored by John as per the table given below.

| **Module Test Marks** | **Grade** |
| --- | --- |
| >= 80 | A |
| >= 73 and < 80 | B+ |
| >= 65 and < 73 | B |
| >= 55 and < 65 | C |
| < 55 | D |

**Scenario 2 :**

The finance department of a company wants to calculate the monthly pay of one of its employees. Monthly pay should be calculated as mentioned in the below formula and display all the employee details.

**Monthly Pay** = Number of hours worked in a week \* Pay rate per hour \* No. of weeks in a month

**Note**:

* The number of hours worked by the employee in a week should be considered as 40,
* Pay rate per hour should be considered as Rs.400 and
* Number of weeks in a month should be considered as 4

**Scenario 3:**

The retail store management wants to automate the process of generating the bill amount for its customers.

* Assume that there is only one customer and one item purchased by the customer.
* The item ids of the items sold by the retail store are 5001, 5002, 5003, 5004, and 5005.
* Quantity purchased by the customer must be greater than 0 and less than 5.
* Item Price must be a minimum of Rs.5.

If the constraints mentioned above are satisfied, the bill amount must be calculated based on the quantity purchased and item price. Otherwise, an error message should be displayed Appropriate error message(s) must be displayed and the bill amount must be considered as 0 if any constraints are violated.

The retail store also wants to give some discount for some of the item ids. The discount has to be identified as per the table given below:

|  |  |
| --- | --- |
| ItemId | Discount in % |
| 5001 | 10 |
| 5002 | 15 |
| 5003 | 12 |
| Others | 0 |

Customer Id, Bill Id, Item Id, Item Price, and Quantity purchased by the customer can be assumed to be as mentioned below:

Bill Id: 1001

Customer Id: 101

Item Id: 5002

Item Price: Rs. 55.0

Quantity purchased: 4

The retail store wants to calculate the discount percentage and bill amount for the customer based on the details given above and display all the details of the customer.

**Scenario 4:**

The billing department of an electricity company wants to develop a system to calculate the monthly electricity bill for its customers. The business rules/constraints are given below:

1. The billing rates are based on the number of units consumed:
   * First 100 units: Rs. 1.5 per unit
   * Next 200 units: Rs. 2.5 per unit
   * Above 300 units: Rs. 4 per unit
2. A fixed charge of Rs. 50 is added to every bill.
3. If the total bill amount exceeds Rs. 1000, a discount of 10% is applied.
4. If the number of units consumed is negative, display an error message.

Example:

* Units Consumed: 350

**Scenario 5:**

The academic department of a university wants to develop a grading system for students. The system should calculate the final grade of a student based on their scores in assignments, mid-term exams, and final exams. The business rules/constraints are given below:

1. Each student has scores for assignments, mid-term exams, and final exams.
2. The weightage for calculating the final score is as follows:
   * Assignments: 30%
   * Mid-term Exams: 30%
   * Final Exams: 40%
3. The grading criteria are:
   * Final Score >= 90: Grade A
   * Final Score >= 80 and < 90: Grade B
   * Final Score >= 70 and < 80: Grade C
   * Final Score >= 60 and < 70: Grade D
   * Final Score < 60: Grade F
4. If any score is negative or greater than 100, display an error message.

**Example**:

* Assignment Score: 85
* Mid-term Exam Score: 78
* Final Exam Score: 92

**Operator Precedence:**

**1.** int a = 5;

int b = 10;

int c = 15;

int result = a + b \* c / (a - b);

**2.** int x = 2; int y = 3; int z = 4;

int result = (x + y) \* z - y;

**3.** int a = 10;

int b = 20;

int c = 30;

boolean result = a < b && b < c || a == b;

**4.** int x = 5;

int y = ++x \* 10 / x-- + --x;

**5.** int a = 2;

int b = 3;

a += b \*= a + 5;