Validation Rules

1. **Pass Marks:**
    - All marks must be 40% or above to be considered a pass.
    - Validate that no marks fall below this threshold.
2. **Categorical Marks:**
    - Marks should be integers (e.g., 42, 44, 48).
    - Check for any non-integer or invalid marks.
3. **Credits Per Level:**
    - Total credits per level should add up to 120 despite credits per module could vary (e.g., 15, 20, 30, 40, 45).
    - Validate this for both levels.
4. **Module Codes:**
    - The first digit of the module code indicates the level (e.g., "5" for Level 5).
    - Ensure module codes align with their respective levels.

Research Tasks:

Explore Undergraduate (UG) Courses:

- Research and gather information about the list of undergraduate courses offered by the university.
- Allow the user to enter the module code unlike the current calculator and validate the input.
- Think about the best way of validating the module codes. You may need to store the module codes into a suitable data structure, such as an ArrayList in java or implement a DB with SQL tables if needed. E.g., COM5003 is a level 5 computer science module, BMM5312 is a level 5 business module, SOC6045 is a level 6 criminology module.

Implement Validation Tests:

- Apply the validation tests described earlier to ensure all data adheres to the specified rules.
- Validation checks include:
- Ensuring all marks are pass marks (≥40%).
- Verifying that marks are integers (categorical).
- Confirming that credits per level sum to the correct total (normally 120 per level).
- Ensuring module codes align with their levels (e.g., "1" for Level 1).

If you encounter challenges during the implementation process:

- Break down the issue into smaller components.
- Reach out to your tutor or peers with a clear explanation of the problem.

- Share your partial implementation or the specific area you're struggling with for targeted feedback.

Test Scenarios

Below are five test scenarios. Each one has been designed to check different aspects of the validation, with calculations provided for troubleshooting:

Scenario 1:

Student A is completing an Undergraduate Bachelor of Arts Degree in International Business. They will complete Level 5 and Level 6 modules. Here are their modules, their respective credits and their marks:

BMM5312	20	78
BMM5402	20	75
BMM5412	20	78
BMM5552	20	75
BMM5562	20	78
BMM5582	20	68
BMM6402	20	68
BMM6422	20	65
BMM6452	20	62
BMM6472	20	68
BMM6502	20	65
BMM6582	20	62

Method A - Average 1 (Level 5 + Level 6): 70.17 (1)

Method B - Average 2 (Level 5 + Level 6 x2): 68.44 (2.1)

Method D - Profile Mark Classification: 2.1

Resulting Classification: 1

Scenario 2:

Student B is completing an Undergraduate Bachelor of Science Degree in Computer Science. They will complete Level 5 and Level 6 modules. Here are their modules, their respective credits and their marks:

COM5003	30	68
COM5013	30	65

COM5023	30	62
COM5033	30	68
COM6003	30	78
COM6033	30	75
COM6013	30	68
COM6023	30	68

Method A - Average 1 (Level 5 + Level 6): 69.00 (2.1)

Method B - Average 2 (Level 5 + Level 6 x2): 70.08 (1)

Method D - Profile Mark Classification: 2.1

Resulting Classification: 1

Scenario 3:

Student C is completing an Undergraduate Bachelor of Arts Degree in Education Studies. They will complete Level 5 and Level 6 modules. Here are their modules, their respective credits and their marks:

CYP5005	15	55
CYP5015	15	52
CYP5023	30	55
CYP5053	30	52
CYP5063	30	55
CYP6005	15	55
CYP6015	15	52
CYP6033	30	68
CYP6073	30	65
CYP6083	30	62

Method A - Average 1 (Level 5 + Level 6): 58.00 (2.2)

Method B - Average 2 (Level 5 + Level 6 x2): 59.38 (2.2)

Method D - Profile Mark Classification: 2.1

Resulting Classification: 2.1

Scenario 4:

Student D is completing an Undergraduate Bachelor of Arts Degree in Sports Journalism. They will complete Level 6 modules. Here are their modules, their respective credits and their marks:

JOU6006	60	58
JOU6063	30	58
JOU6093	30	68

Method C - Average 1 L6: 60.50 (2.1)

Method D - Profile Mark Classification: 2.2

Resulting Classification: 2.1

Scenario 5:

Student E is completing an Undergraduate Bachelor of Science Degree in Sports Coaching. They will complete Level 6 modules. Here are their modules, their respective credits and their marks:

SHN6033	30	68
SHN6053	30	65
SHN6073	30	62
SHN6143	30	42

Method C - Average 1 L6: 59.25 (2.2)

Method D - Profile Mark Classification: 2.1

Resulting Classification: 2.1