Lesson 10

**Black Box test design techniques practice. Pt.1: equivalence partitioning, boundary value analysis, pairwise testing**

Level 1:

**1. The speed control system has the following characteristics:**

- at a speed of 50 km/h or less — the system does not respond

- at a speed of more than 50 but less than 55 km/h — the system issues a warning

- at a speed of more than 55, but less than 60 km/h — the system will issue a fine

- at a speed of more than 60 km/h — the driver will receive a fine and a penalty point in

the driver's license

The speed in the system is measured in integer values. Which of the test data sets can be

used to test all the boundary values of the equivalence classes?

A. 0, 49, 50, 54, 59, 60

B. 50, 55, 60

C. 49, 50, 54, 55, 60, 62

D. 50, 51, 55, 56, 60, 61

**2. A fitness app counts the number of steps and sends messages encouraging users to move. Depending on the number of steps, the feedback will be as follows:**

- up to 1000 inclusive – “Couch potato”

- from 1000 to 2000 inclusive – “Bit lazy, huh”

- from 2000 to 4000 inclusive – “Keep moving!”

- from 4000 to 6000 inclusive – “Nice!”

- over 6000 – “Amazing job!”

Which test data set will provide the best coverage of equivalence classes?

A. 0, 1000, 2000, 3000, 4000

B. 1000, 2001, 4000, 4001, 6000

C. 123, 2345, 3456, 4567, 5678

D. 666, 999, 2222, 5555, 6666

Level 2

**1.** **A device that measures the time and intensity of sunlight received by a plant counts a**

**combination of parameters: time in the sun (less than 3 hours, 3 to 6 hours, and more than 6 hours) and light intensity (very low, low, medium, high).**

There is the following set of tests:

|  | Hours | Intensify | Index of exposure |
| --- | --- | --- | --- |
| Test 1 | 1,5 | Very Low | 10 |
| Test 2 | 7 | Medium | 60 |
| Test 3 | 0’5 | Very Low | 10 |

What is the minimum number of additional test cases required to ensure that all valid

equivalence classes are covered?

A. 1

B. 2

C. 3

D. 4

Explanation:

The provided test cases covered:

Time in the Sun: Less than 3 hours and More than 6 hours

Light Intensity: Very Low

To ensure all valid equivalence classes are covered, adding test cases for the missing combinations is necessary.

The missing combinations are:

3 to 6 hours (Time in the Sun) with Light Intensity levels 2 (Low) and 4 (High).

The minimum number of additional test cases required is 2, covering these missing combinations.

**2. The video playback application has requirements. The application will work on devices**

**with this resolution**:

1. 640x480

2. 1280x720

3. 1600x1200

4. 1920x1080

What test case is the result of applying the equivalence partitioning technique? Support

your answer.

A. Check that the application plays video on a 1920x1080 display (1 test case).

B. Check that the application plays video on 640x480 and 1920x1080 displays (2 test

cases)

C. Check that the application plays video on displays of all sizes specified in the

requirements (4 test cases)

D. Check that the application plays video on any display size specified in the

requirements (1 test case).

Explanation:

We should create test cases representing each equivalence class to apply Equivalence Partitioning. Each resolution represents a separate equivalence class in this scenario because the application may behave differently on displays with different resolutions.

So, the answer that represents the result of applying the Equivalence Partitioning technique is C: "*Check that the application plays video on displays of all sizes specified in the requirements (4 test cases).*" This ensures that each resolution is tested to see if the application works correctly on displays of all specified sizes.

Level 3

**Write requirements for the app to regulate the minimum and maximum size of photos the users can upload to the system. Also, mention the following parameters: minimum length of comments under photos and the maximum length of comments under photos (the more parameters you come up with, the better).**

**Write test cases incorporating equivalence partitioning and boundary value analysis, allowing you to verify these requirements.**

Photo upload requirements:

**Minimum Photo Size:** Photos uploaded to the system must have a minimum dimension of 640x480 pixels.

**Maximum Photo Size:** Photos uploaded to the system must be at most 10 MB.

Comment Length Requirements:

**Minimum Comment Length:** Comments under photos must be at least five characters long.

**Maximum Comment Length:** Comments under photos must be at most 200 characters.

Additional Parameters:

**Supported Photo Formats:** The system must support commonly used image formats, including JPG, PNG, and GIF.

**File Type Validation:** The system should validate file types to ensure that only valid image formats are accepted.

**File Size Validation:** The system should perform file size validation to reject photos exceeding the maximum size.

**Error Messages:** When users attempt to upload photos or comments that don't meet these requirements, the system should provide clear, user-friendly error messages explaining the issue.

**User Feedback:** The system should provide feedback when the users successfully upload photos and comments, confirming that they meet the requirements.

Photo Upload Test Cases:

**Equivalence Class for Photo Size:**

Test Case 1: Upload a photo with dimensions 640x480 (minimum size).

Test Case 2: Upload a photo with dimensions 1280x720 (within the acceptable range).

Test Case 3: Upload a photo with dimensions 1600x1200 (within the acceptable range).

Test Case 4: Upload a photo with 1920x1080 (maximum size) dimensions.

Test Case 5: Attempt to upload a photo with dimensions below 640x480 (below the minimum).

Test Case 6: Attempt to upload a photo with dimensions above 1920x1080 (above the maximum).

**Equivalence Class for File Size:**

Test Case 7: Upload a photo of 1 MB (within the acceptable range).

Test Case 8: Upload a photo of 10 MB (maximum size).

Test Case 9: Attempt to upload a photo below 1 MB (below the minimum).

Test Case 10: Attempt to upload a photo above 10 MB (above the maximum).

Comment Length Test Cases:

**Equivalence Class for Comment Length:**

Test Case 11: Post a five-character comment (minimum length).

Test Case 12: Post a comment with 100 characters (within the acceptable range).

Test Case 13: Post a comment with 200 characters (maximum length).

Test Case 14: Attempt to post a comment with four characters (below the minimum).

Test Case 15: Attempt to post a comment with 201 characters (above the maximum).

These test cases cover different scenarios and boundaries to ensure that the requirements for photo size and comment length are met.