Assignment 1
Task 8

Author Details

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Identify the most appropriate black box testing strategy for each piece of functionality, and justify your answer.

Write 2 paragraphs of justification per answer, and mention at least one alternate strategy and why it would not work as well as your chosen strategy.

Functionality 1: Whether an item is overdue. The input for this functionality would be the item's due date and the current date. The output would be true if the item is overdue, and false if it is not.

Testing strategy:

Boundary Value Analysis and Equivalence Paritioning

Justification:

A multi-faceted approach of Boundary Value Analysis and Equivalence Patitioning offers a comprehensive and effective testing strategy to determine whether an item is overdue with the knowledge of item's due date and the current date. Boundary Value Analysis is highly effective in making key decision of whether an item is before or after the due date, by comparing the current date with the exact boundary of the due date. With the adoption of Boundary Value Analysis technique, the testing assures to handle the key transitions correctly , with testing critical boundaries like the upper boundary of the on-time dates and the lower boundary of the overdue dates, which involves significant state shifts from on-time to be overdue.

Combining Equivalence Partitioning, it essentially broadens the testing coverage by dividing the input dates into equivalence classes of on-time dates and overdue dates. Equivalence Partitioning is highly useful in covering a wide range of input dates with sample representative dates from each equivalence class, assuring cases of well before or far after the due date, such as items due months ago or due far a year ago, are tested correctly without exhaustively testing each individual date. Alternatively, Decision Table testing can be applied but particularly a less suitable approach in this case. A Decision Table testing adopted in this scenario will result in a long and elaborated decision making as it involves a direct comparison of the two dates to determine if the item is on-

time or overdue. As far as our functionality is concerned, where it has a clear and straightforward simplicity of "on-time or overdue", Decision Table testing would unnecessarily complicate the test design for this simple scenario, albeit the testing is still accurate, but not necessary, thus the multi-faceted approach of Boundary Value Analysis and Equivalence Partitioning is employed to test this functionality in an optimised manner.

Functionality 2: The calculation of fees owed. The input for this functionality would be a patron's age, and their outstanding fees. The output would be an amount of money owed, based on their fees and what discount they're eligible for.

Testing strategy:

Decision Table and Equivalence Partitioning

Justification:

A multi-faceted approach of Decision Table and Equivalence Partitioning offers a comprehensive and ideal testing strategy to determine the calculation of fees owed by what discount to be applied to patron's fee based on their age. Decision Table testing is highly effective in making decision based on multiple conditions and scenarios to consider, such as different age groups and varying fee amounts. With the adoption of Decision Table testing, all possible combinations of input ages and fee amounts are mapped to their respective expected outputs, effectively capturing all permutations of age groups and their enjoyed discounts to their fee payment.

Combining Equivalence Partitioning, it optimises the testing procedures by categorising different input ages into its respective equivalence classes for testing. Equivalence Partitioning is highly useful in testing only the sample representative ages from each equivalence class, which are patrons under or exactly the age of 50, patrons between the ages of 50 and 65, patrons over the ages of 65 but under the ages of 90 and patrons over the age of 90, where to ensure the functionality behaves correctly with the respective applied discount of 0%, 10%, 15% and 100% to the fee calculation. Hence, the combination of Decision Table and Equivalence Partioning techniques assures a thorough and rigorous validation across all potential input combinations while also effectively testing by representative group data in a more optimised manner. Alternatively, Boundary Value Analysis and Equivalence Partioning can be applied but particularly less effective approach for this case. The combination of Boundary Value

Analysis and Equivalence Partitioning adopted in this scenario can be applied when the input ranges and critical boundaries are direct and simple but do not comprehensively cover the complex interactions between multiple inputs of age and outstanding fees, compared to Decision Table testing, all possible combinations are tested and not overlooked.

Functionality 3: Whether a person is allowed to use the makerspace facilities. The input for this functionality would be a person's age, and whether they have completed the appropriate training or not. The output would be true if they can use the makerspace facilities, and false if they can not.

Testing strategy:

Decision Table and Equivalence Partitioning

Justification:

A multi-faceted approach of Decision Table and Equivalence Partitioning offers a robust and comprehensive testing strategy to determine the patron's eligibility to enjoy the makerspace service based on their age and the completion of required training. Decision Table testing is highly effective in making decision based on multiple conditions and scenarios to consider, such as different age groups, where some ages are restricted for this service, and the training completion, where the specific training must be completed first. With the adoption of Decision Table testing, all possible combinations of input ages and training completion are mapped to their respective expected outputs, ensuring thorough and accurate validation across all conditions.

Combining Equivalence Partitioning, it optimises the testing procedures by categorising different input ages and training completion into its respective equivalence classes for testing. Equivalence Partitioning is highly useful in testing only the sample representative ages from each equivalence class, which are elderly patrons and non-elderly patrons for age class, as well as complete and incomplete training for training class, where to ensure the functionality behaves correctly where elderly patrons will not enjoy the makerspace service and patrons with incomplete training will not be allowed to the makerspace service. Hence, the combination of Decision Table and Equivalence Partioning techniques assures a thorough and rigorous validation across all potential input combinations while also effectively testing by representative group data in a more optimised manner. Alternatively, Boundary Value Analysis and Equivalence Partioning

can be applied but particularly less effective approach for this case. The combination of Boundary Value Analysis and Equivalence Partitioning adopted in this scenario can be applied when the input ranges and critical boundaries are direct and simple but do not adequately cover the full logic interactions between inputs of age and training status, compared to Decision Table testing, all possible combinations are tested and not overlooked.