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Software Quality Assurance
(WS 08/09)

Problem Set 4

Due Thursday, December 18th, 2008

Problem 1: Functional Test: Equivalence Class Partitioning

A booking system processes incoming payment and payout of business customers and private customers according to transaction principles. For this processing, the system requires the account number as well as **the amount posted**. A **payout** is valid if it does not exceed the limit of the maximum amount of 5000€. A business account number begins with a G. A private account number begins with a P.

a) Please determine the equivalence class partitions for the given functionalities.
b) Please determine the test cases for all the equivalence classes.

Problem 1 (Variant 2)

A booking system processes incoming payment and payout of business customers and private customers according to transaction principles. For this processing, the system requires the account number as well as **the booking amount**. A **booking** is valid if it does not exceed the limit of the maximum amount of 5000€. A business account number begins with a G. A private account number begins with a P.

a) Please determine the equivalence class partitions for the given functionalities.
b) Please determine the test cases for all the equivalence classes.

Problem 2: Equivalence Class Partitioning with Boundary Value Analysis

A student data management program processes registration number, name, major, and mark (on average) of every single student. The student registration number is a five-digit integer that is not smaller than 10000. The program knows the majors Mathematics, Computer Science (CS), Philosophy, and English. The program knows the marks 1.0, 2.0, 3.0, 4.0, and 5.0. A valid name has at least 3 and at most 20 characters.

a) Please determine the equivalence class partitions for the given functionalities.
b) Please determine the test cases for all the equivalence classes using the procedure of boundary value analysis.

Problem 3 State-based Test

Given is the specification of a digital watch software.

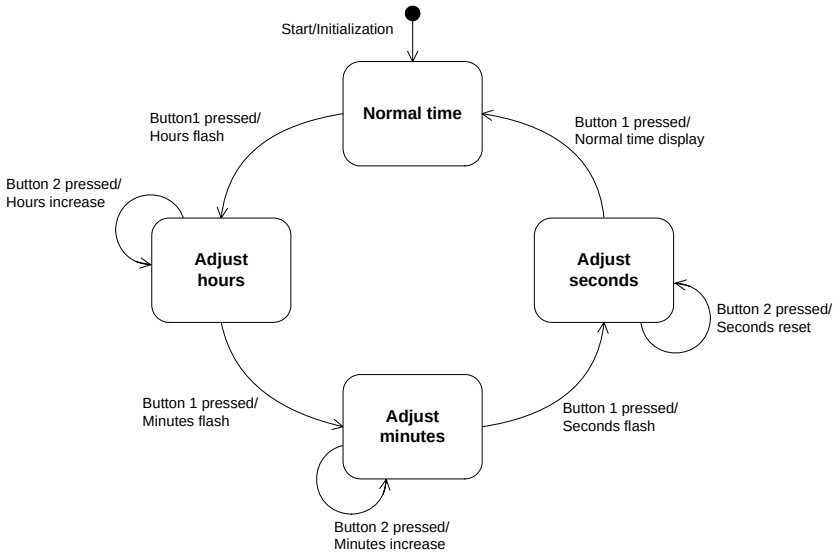
For adjustment of a digital watch, the following states are to be considered:
Normal time: State after inserting the battery
Adjust Hours: Hours can be adjusted
Adjust Minutes: Minutes can be adjusted
Adjust Seconds: Seconds can be adjusted

The following events could occur:
Start signal: Battery inserted
Button 1 pressed
Button 2 pressed
The two buttons must not be pressed simultaneously.

The following outputs could happen:

Hours flash:	The operator is currently in the hour editing mode.
Minutes flash:	The operator is currently in the minute editing mode.
Seconds flash:	The operator is currently in the second editing mode.
Hours increase:	The hour display has increased by 1 hour.
Minutes increase:	The minutes display increases by 1 minute.
Seconds reset:	00 displays as second display.
Initialization:	Display of 00:00:00

State chart "Watch adjustment"



a) Please determine the test data for the program execution that traverses every state. Please select the simplest test cases.
b) Please determine the test data for the program execution that traverses every transition. Please select the simplest test cases.