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Software Testing – Foundation Level Exercises

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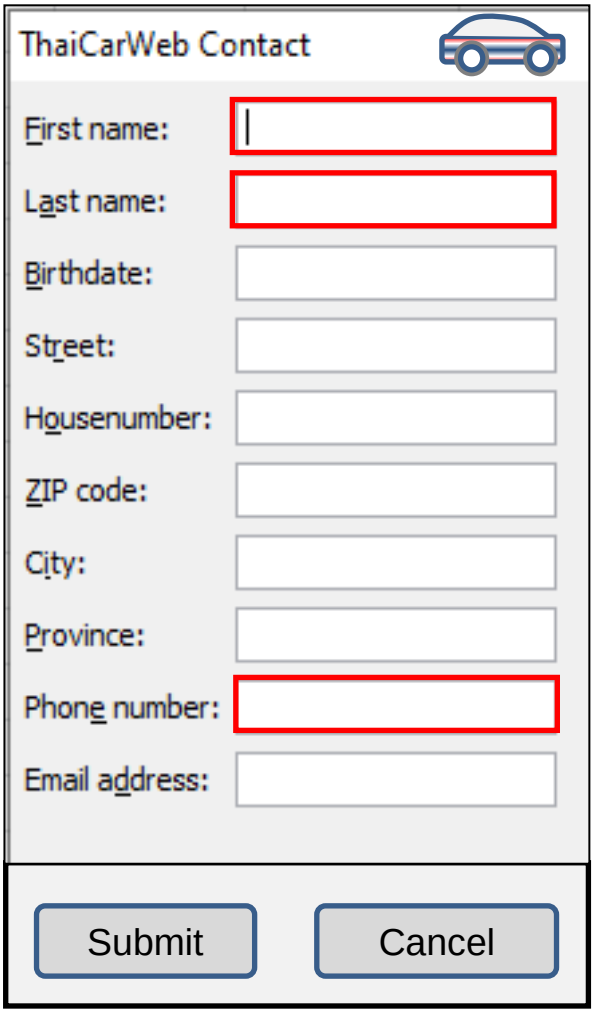
Exercise 1. Review of a specification

Specification for contact module of "ThaiCarWeb"

The contact module allows for all interested user worldwide to enter fast and user friendly their contact data to get in contact with the ThaiCar company.



The ThaiCarWeb Contact page and every related page of the contact module contain the "ThaiCar" logo.

The mandatory fields should be highlighted with a red frame.

Mandatory fields are:

1. First name
2. Last name
3. Phone number

The ZIP code can contain 5 digits.

First name and last name can contain up to 100 characters.

The birthdate is stored as date.

All other fields can contain up to 50 alphanumeric characters.

After the customer pressed the Submit button, ThaiCarWeb checks the entries. If all entries are okay, they will be transferred to the ThaiWeb database.

The email address entry is mandatory and must contain a '@' character and at least 5 characters.

If the birthdate has not been entered, an error window pops up until the birthdate is entered. The error window must contain the "ThaiCar" logo.

The transferred data will be mapped to corresponding attributes of the ThaiCarWeb database. Each could contain up to 50 alphanumeric characters. The TCWEB table contains:

TCWEB_CON_FIRSTNAME,	VARCHAR(50)	TCWEB_CON_ZIP CODE,	VARCHAR(50)
TCWEB_CON_MIDDLENAME,	VARCHAR(50)	TCWEB_CON_CITY,	VARCHAR(50)
TCWEB_CON_LASTNAME,	VARCHAR(50)	TCWEB_CON_PROVINCE,	VARCHAR(50)
TCWEB_CON_BIRTHDATE,	VARCHAR(50)	TCWEB_CON_PHONE NUMBER,	VARCHAR(50)
TCWEB_CON_STREET,	VARCHAR(50)	TCWEB_CON_EMAIL ADDRESS,	VARCHAR(50)
TCWEB_CON_HOUSENUMBER,	VARCHAR(50)		

Check the specification concerning inconsistencies, ambiguities, contradictions, omissions, inaccuracies, and redundancies.

Exercise 2. Equivalence Partitioning

ThaiCarWeb contains a used car module, offering used cars. The current stock in the test environment contains as test data 16 used cars.

1. 2009 ThaiCar 9 C, 60 hp, coupé, 4 doors, mileage: 350,000 km, ฿59,000,
2. 2008 ThaiCar 9 S, 95 hp, sedan, 4 doors, mileage: 189,000 km, ฿64,000,
3. 2006 ThaiCar 9 TLS, 95 hp, sedan, 3 doors, mileage: 270,000 km, ฿66,000,
4. 2009 ThaiCar 9 CL, 60 hp, coupé, 2 doors, mileage: 220,000 km, ฿89,000,
5. 2010 ThaiCar 9 T, 60 hp, hatchback, 5 doors, mileage: 177,000 km, ฿99,000,
6. 2012 ThaiCar 9, 60 hp, sedan, 2 doors, mileage: 65,000 km, ฿109,000,
7. 2014 ThaiCar 9 CS, 95 hp, coupé, 4 doors, mileage: 104,000 km, ฿159,000,
8. 2011 ThaiCar 9 TS, 95 hp, hatchback, 3 doors, mileage: 123,000 km, ฿200,000,
9. 2016 ThaiCar 9 L, 60 hp, sedan, 4 doors, mileage: 85,000 km, ฿253,000,
10. 2015 ThaiCar 9 TL, 60 hp, hatchback, 5 doors, mileage: 76,000 km, ฿289,000,
11. 2015 ThaiCar 9 S, 95 hp, sedan, 4 doors, mileage: 41,000 km, ฿320,000,
12. 2018 ThaiCar 9 T, 60 hp, hatchback, 3 doors, mileage: 34,000 km, ฿321,000,
13. 2017 ThaiCar 9 CL, 60 hp, coupé, 4 doors, mileage: 52,000 km, ฿322,000,
14. 2019 ThaiCar 9 LS, 95 hp, sedan, 4 doors, mileage: 13,000 km, ฿499,000,
15. 2019 ThaiCar 9 CLS, 95 hp, coupé, 2 doors, mileage: 1,000 km, ฿500,000,
16. 2019 ThaiCar 9 TLS, 95 hp, hatchback, 3 doors, mileage: 4,500 km, ฿609,000,

A financing module offers credits, if a customer would like to buy a used car. Credits are only offered, if the car costs ฿100,000 or more. The interest rate is 2.0 %, but there are some exceptions. If the car costs ฿200,000 or less, the interest rate is 4.5 %. If the car costs more than ฿200,000 but less than ฿321,000, the interest rate is 3.5 %.

For all cars that cost ฿500,000 or more, the interest rate is 0.5 %.

a) How many tests must be executed for Equivalence Partitioning?
b) Define the partitions that should be tested.
c) Which test data would you use for testing?

d) Write the corresponding test cases.

Exercise 3. Boundary Value Analysis

Based on Exercise 2:

a) How many tests must be executed for Boundary Value Analysis?
Hints: Please consider for each partition class minimum and maximum value.
All prices are multiples of ฿1,000, this means every price is step up with ฿1,000.
For example there is no price possible like ฿99,999 or ฿105,550.

b) Which test data would you use for testing?

c) Propose test data to be added.

d) Write all required additional test cases

Exercise 4. Decision Table Testing

ThaiCarWeb contains a configuration module, for a new ***ThaiCar 9***. A user could configure a ***ThaiCar 9*** and gets finally – after the configuration is finished – the price.

ThaiCar 9 is offered with either a basic engine with 60 horse power, or with a sport version with 95 horse power. The basic price is ฿495,000, the basic price for the sport version ***ThaiCar 9 S*** (S is added at the end of the type name) is ฿545,000.
The car body is available in three variants: sedan, coupé, or hatchback, where the sedan version is standard. The extra charge compared to the sedan version for the coupé version is ฿40,000, the extra charge compared to the sedan version for the hatchback version is ฿85,000.
The Coupé type name starts with 'C', like for example ***ThaiCar 9 C*** or ***ThaiCar 9 CS.***
The hatchback type name starts with 'T', like for example ***ThaiCar 9 T*** or ***ThaiCar 9 TS.***
Every ***ThaiCar 9*** has 2 doors (sedan, coupé) or rather 3 doors (hatchback) as standard equipment. 2 more doors could be ordered for ฿35,000.
Luxury equipment for every ***ThaiCar 9*** could be ordered for ฿100,000. To be able to recognize the luxury version, in the type name 'L' is listed, for example ***ThaiCar 9 CL*** or ***ThaiCar 9 TLS.***

a) Crate a decision table for all combinations. How many combinations are possible?

b) How much costs the cheapest, and how much costs the most expensive version of ***ThaiCar 9?***

The management decided to offer the ***ThaiCar 9*** coupé version only with 2 doors, and only with luxury equipment.

c) What are the consequences concerning the decision table created?
How many combinations are possible now?

The management decided to promote the hatchback versions of ***ThaiCar 9***: for a price for ฿555.000. Every hatchback version gets without extra charge the luxury equipment, sport version engine with 95 horse power, and 5 doors.

d) What are the consequences concerning the decision table created?
How many combinations are possible now?

e) List test cases with headlines for the decision table created with task d). Assign priorities to the test cases, either “critical”, “major”, or “minor”.

Exercise 5. State Transition Testing

Specification:

ThaiCarWeb contains a used car module, offering used cars. The initial state of a used car is “offer”. If a user is interested in a specific used car, he can click on it, and a detail page opens showing all details for the selected car. The car gets the state “interested”, including a counter, counting how often any user opened the detail page.

The detail page offers a “Reservation” button, where a user could reserve a car. After clicking the button, another page opens, where the user could enter his contact data and confirm the reservation. After confirmation the car gets the state “reserved”. If a user signs a contract with the related dealer to buy the car, the dealer updates the state of the car to “sold”. If there is no contract signed in 4 weeks, the reservation gets cancelled and the car gets the initial state again.

a) Crate a state diagram based on the information in the specification.

b) How many test cases should be created? Describe for all test cases the headline and a short description.

c) Determine which of the identified test cases to be created should get the highest priority. Add for this test case the required test steps.

Exercise 6. Use Case Testing

User Story: CC001: As a buyer of a “Thai Car” I want to pay with credit card.

Description:

Precondition is that the user has chosen a “Thai Car” to buy and already entered his contact data (*see specification for contact module of “**ThaiCarWeb**”*).
After the user clicked on a radio button “Want to buy with credit card”, a “credit card payment” side opens and the user may chose the credit card he would like to use.

It is expected that about 80 % of all buyers will use the “Thai Extend” credit card. Credit cards from “MainCard” and “SuperCisa” will be accepted as well.

After the user has chosen the type of credit card he enters his name. Then, he enters his credit card information: the credit card number, expiration date, and security code.

Finally the user clicks the [Buy now] button. A confirmation page opens, additionally a confirmation email is sent.

Acceptance criteria:

1. A user can buy a car with a credit card from “MainCard”, “SuperCisa” or “Thai Extend”.
2. An error message appears, if there is an issue with the credit card like wrong credit card number, expire date not correct, wrong security number, or credit not confirmed by credit card company.
3. System documentation is updated.

Tasks:

a) How many test cases should be created? Describe for all test cases the headline and a short description.

b) Determine which of the identified test cases to be created should get the highest priority “critical”. Add for this test case the required test steps.

Exercise 7. Regression Testing

After refactoring ***ThaiCarWeb***, regression tests should be executed to ensure that the application is still working as before. The regression tests should cover test cases of the areas.

1. Financing module (Exercises 2 and 3)
2. Configure module (Exercise 4)
3. Buy used car module (Exercise 5)
4. CreditCard module (Exercise 6)

There is a capacity of 10 test cases to be executed. The management asked for advice, when you could give a first impression of the quality of the system.

a) Write a test execution schedule. Which test cases would you propose to execute for a regression test in which order? Which priority you would assign? Please explain.

   Criteria:
   * All modules should be covered
   * All critical test cases should be covered.
   * Most important variants should be covered.

b) After execution of which test cases would you give a feedback to the management of a first impression?

Exercise 8. Defect Management

After delivery of ***ThaiCarWeb*** v2.1 by the lead of development, Mr. Pan Flee, testing started on 16.02.2020. Two failures were reported by business users.

1. Mr. Joe Tom

   With ThaiExtend no paying is possible no more!
   Data:
   Ben Thai-Tester"
   Credit card number "4716 3445 6991 1778"

   Expiration date 11/2024 was not accepted! No more proceeding!
   Who developed such 💣&☹☠§! Software??
   Screenshot1.jpg and Screenshot2.jpg are attached.

2. Mrs. Noo Yang

   The developers did a wrong deployment! It is still the old code! When configuring our famous ThaiCar 9 GTS it still shows the standard price, and not the offer of ฿555,000. I do not understand how this could be possible.

   Screenshot3.jpg and Screenshot4.jpg are attached.

a) Write formal defect reports for the reported failures.