



KING SAUD UNIVERSITY
COLLEGE OF COMPUTER AND INFORMATION SCIENCES
DEPARTMENT OF SOFTWARE ENGINEERING

Course Code / Title: SWE 434: Software Testing and Validation **Professor:** Prof. M. Shamim Hossain and M. Abdullah-Al-Wadud, Ph.D ✓ **TAKE HOME ASSIGNMENT** ☐ MIDETRM ☐ FINAL

TOTAL MARKS: 5

Semester / Year: 1st/2024-2025..... **Deadline:** Oct. 1, 2024..... **Duration:** N/A

Responsible TA/Lecturer: Mr. Muhammad Nasir Muhammad Sarwar

POLICY & ETHICS: [*Please read carefully*]

- No plagiarism- Copying others' work is not allowed
- Clarity, accuracy and justification of your answers are key elements in the evaluation.
- **No hard copy or email is accepted. If submitted or sent as a hard copy or email 50% marks will be deducted. ONLY through LMS.**
- **After the deadline for the 1st day 50%,** and the subsequent days extra 10% will be deducted such as the 2nd day 60%, 3rd day 70%, and so forth.
- TA and Professor are not responsible, if you are unable to submit before the deadline.

QUESTIONS / STUDENT OUTCOMES: This exam covers/targets the following student outcomes (SOs):

- **SO (2)-** an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- **SO(6)-** an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

			SO (2)	SO (6)	Marks
Q1.a (2.5 marks)		✓	/2		/2
Q1.b (1 marks)				✓ 1 /2	/2
Q1. c (1 marks)				✓ /1	/1
Total Marks			2	/3	/5

FEEDBACK SUMMARY:

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STUDENT IDENTIFICATION:

Name: **ID:** **Section:** **Signature:**

By signing this form, the student recognizes that he understands and accepts the exam policy and ethics. He/she recognizes also that if he/she does not respect these ethical rules, the professor will take the appropriate measures including exclusion from the exam.

Q1. Use the equivalence-class partitioning & boundary condition analysis strategy to derive use case data for a Login window of a system. After **Login**, you will be directed to pay in the 2nd window of the BOOKING.COM Payment Method.

Login

User ID

Password

If you have not yet registered, click [here](#).

(Note: Ten CONSECUTIVE logon failures will result in your account to be locked, if applicable)

Enter **User ID** (mandatory): 6 characters maximum, 4 characters minimum, no special character except # (number sign) characters are allowed

Enter **Password** (mandatory) 9 characters' maximum, at least one digit, but the first and the last characters cannot be digits

Concluding with one of the following, however, *in order to go to the 2nd screen, the user need to **Login**:*

L Login (only the first click has an effect)

R Reset (only the first click has an effect)

H Click "[here](#)" (only the first click has an effect)

For example, the Use Case Data: C00D01, P2345BX, L where **User ID** is entered as C00D01, **Password** is entered as P2345BX, **Login** button is clicked as L.

2nd Screen After Login

Use the boundary-interior analysis strategy to derive use-case data requirements for the BOOKING.COM Payment Method (the top 4 rows -boxes under the BOOKING.COM) shown below

Booking.com SAR

Title First name Last name *

Enter details to hold your booking

Credit/debit card type *
-- Select --

Card number *

Expiry date *
01 - Jan / 2017

No card?

No charge - only needed to reserve your room

As shown above, the customer has 4 drop-down menus and 3 input fields to fill in before submitting the payment. Some constraints are:

Title can be selected only Dr, Engg., and Prof.

CardHolder's **First Name** must be between 8 to 6 characters long.

Cardholder's **Last Name** must be no more than 9 characters in total.

Credit **Card Numbers** must be no more than 12 digits. However, the first digit of the Mastercard, Visa and Dinner Card should be 5, 4, and 3 respectively.

Credit/debit card types can have selected as V, M, and D

State all assumptions and fill in the tables below. Note that use case data includes strings built up out of the card numbers and cardholder names and the following abbreviations for drop-down menus.

Abbreviation	Meaning	Abbreviation	Meaning
V	Select Visa	M	Select Mastercard
D	Select Dinner	09-Sep	Select September
10-Oct	Select October	01-Jan	Select Jan
2017	Select Year 2017	2022	Select Year 2022
2019	Select Year 2019	2024	Select Year 2024

For example, the Use Case Data:

Dr SultanAlahmadi V423546789009-Sep2022 means:

Choose Dr. as **Title**,

Type **First Name** as Sultan, Type **Last Name** as Alahmadi

Choose Visa **Credit/debit card type**

Enter **Card Number** of 4235467890

Choose Sep as **Month**, Choose 2022 as **Year of Expiry**

Question 1. (continued)

- (a) Table 1: Equivalence Classes of Requirements (Number each equivalence class distinctly for future reference) [2 marks] Give each input condition, and for each one, give at least two (2) valid equivalence classes (if possible), and two (2) or more invalid equivalence classes in the table below. The 1st input is written for you.

Input Condition	Valid Equivalence Classes	Invalid Equivalence Classes
User ID	.....(1)	.....(3)
	.....(2)	
	.....(1)	
	.....(2)	.....(3)
	.....(1)	
	.....(2)	.....(3)
	.....(1)	
	.....(2)	.....(3)
	.....(1)	
	.....(2)	.....(3)
	.....(1)	
	.....(2)	

Question 1. (b) Table 2: Boundary-Interior Use-Case Data to cover Valid Equivalence Classes

[2 marks- total 4 cases]. 2 Sets of use Cases: Login Screen and Payment- [1 set for the Login screen, and 1 set for the 2nd /payment screen]. Please try to give different examples/use cases wherever applicable

Use Case No	Use Case Data	Class(es) Covered	Class(es) Boundaries Covered

Question 1. (c) Table 3: Boundary-Interior Use-Case Data for 8 Invalid Equivalence Classes

[1 marks] [4 for the 1st window/login window and 4 for the 2nd window/payment]

Use Case No	Use Case Data	Class(es) Covered	Test Purpose (briefly)