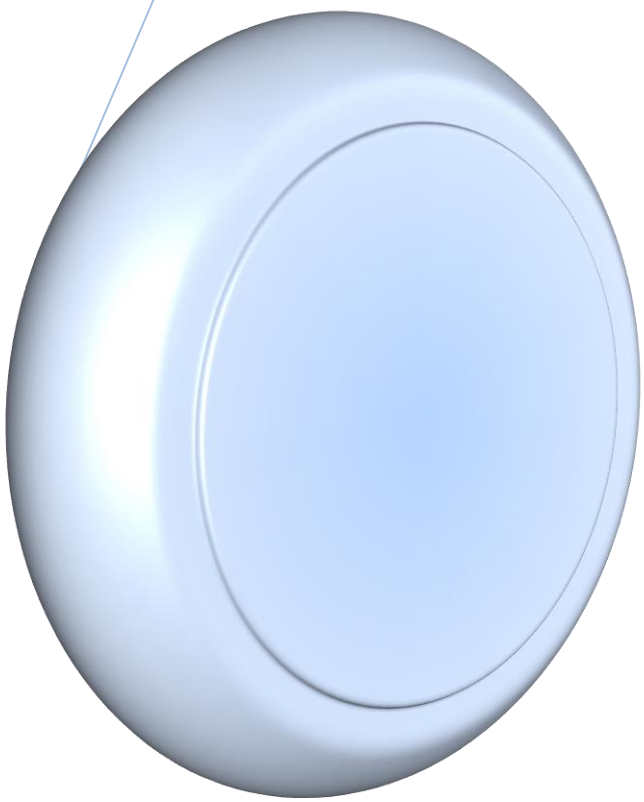

Software Quality Engineering

Assignment 3 Submitted To: Sir SamirObaid

Github Link:
https://github.com/UsamakhanBSE181015/SQEAssignment-Quickupdate/commits/main

Usama khan (BSE181015) M. Hamza Rasheed (BSE181020)

11/1/2020

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Summary of Changes

Change No 1	**Function 3:** Is changed in this Assignment according to feedback of assignment 1.	Changed
Change No 2	**Changed Assignment according to feedback of assignment 2 .**	**Changed**

-

CASE STUDY

[redacted]

(Problem Statement)

Each year many people apply to join the Army as an **Officer** – as part of the tough selection process they are required to fill a form and army officer briefing and also a main board. For the board the applicant will be required to fill a form for the registration for initial test. Entry requirement is Intermediate. There are again few categories in Regular Commission. Those who join for the battlefield and pure armed forces services go through **PMA** Course. While there are other who provide support services to those engaged in the battlefield **I.e.** Engineering services, these enter through this form.

Those having FSC Pre-engineering or ICS with Physics can apply for Cadet Course. ISSB Selected candidates are required to complete four years engineering degree in Electrical, Civil, Computer, Software, Mechanical, Telecom, Mechatronics or Aeronautical Engineering from Military colleges. Studies are financed by Pakistan Army. One Year Military Training is provided at Pakistan Military Academy Kakul, after the completion of four years Engineering Degree.

At very start of this form we will ask academics from the applicant if their education criteria occurs at the below of the required condition they cannot further fill the registration form, they will experience an eligibility error at that time.

After academics there will be another form which will ask the applicant for their physical condition. In case if their physical condition gets below the line for the requirement for this registration they still cannot be able to further fill the form. Moving on to the last page of the form, this form, Required the background information of the applicant to authenticate the applicant which includes the criminal record if the applicant has any kind of criminal record against him/her the applicant is not clear another information which is required is marital status of the applicant, the applicant should be unmarried to clear fulfil the requirement and the last thing is the most important aspect which is the nationality of the applicant, only Pakistani national are allowed to apply for the army test.

Assignment 1 and 2 Contents

For case study selected in Assignment 01

a. Write down test cases using strong robust equivalence class partitioning

i. Write down test cases for all three functions including a function having three parameters

1. **Void check Acadamics (double Mmarks, double Fmarks)**

Matric marks range = 50 >= Mmarks <= 100

Fsc marks range = 60 >= Fmarks <= 100

Boundary values for analysis

Matric marks = 50, 51,75,99,100

Fsc marks = 60,61,80,99,100

Total number of test cases:-

5n=> n=2 =>5^2=> 25

Test Cases Function 1

Test Cases	Mmarks	Fmarks	ExpectedOutPut
1	50	60	Clear
2	50	61	Clear
3	50	80	Clear
4	50	99	Clear
5	50	100	Clear
6	51	60	Clear
7	51	61	Clear
8	51	80	Clear
9	51	99	Clear
10	51	100	Clear
11	75	60	Clear
12	75	61	Clear
13	75	80	Clear
14	75	99	Clear

15	75	100	Clear
16	99	60	Clear
17	99	61	Clear
18	99	80	Clear
19	99	99	Clear
20	99	100	Clear
21	100	60	Clear
22	100	61	Clear
23	100	80	Clear
24	100	99	Clear
25	100	100	Clear

2. **Void check physique (int Age, double Height)**

Age Range = 18>=Age<=24
Height Range = 5.6>=Height<=7.0

Boundary value for analysis.

Age = 18, 19,21,23,24

Height= 5.6, 5.7,6.3,6.9,7.0

Total number of test cases.

5^n=>n=2=>5^2=>25

Test Cases Function 2

Test Cases	Age	Height	ExpectedOutPut
1	18	5.6	Clear
2	18	5.7	Clear
3	18	6.3	Clear
4	18	6.9	Clear
5	18	7.0	Clear
6	19	5.6	Clear
7	19	5.7	Clear
8	19	6.3	Clear
9	19	6.9	Clear
10	19	7.0	Clear
11	21	5.6	Clear
12	21	5.7	Clear

13	21	6.3	Clear
14	21	6.9	Clear
15	21	7.0	Clear
16	23	5.6	Clear
17	23	5.7	Clear
18	23	6.3	Clear
19	23	6.9	Clear
20	23	7.0	Clear
21	24	5.6	Clear
22	24	5.7	Clear
23	24	6.3	Clear
24	24	6.9	Clear
25	24	7.0	Clear

3. **Void Check_background(String Nationality, String Criminal_Rec., String Married)**

   Boundary values for Analysis cannot be performed for the String values so here we defined some test cases using the EQP.

   Nationality = Pakistani, Not Pakistani

   Criminal Rec = Yes, No

   Married = Yes, No

Test Cases Function 3

Test Cases	Nationality	Criminal Rec	Married	Expected Output
1	Pakistani	No	No	Clear
2	Pakistani	Yes	Yes	Not Clear
3	Not Pakistani	Yes	No	Not Clear
4	Pakistani	No	Yes	Not Clear
5	Not Pakistani	No	No	Not Clear
6	Not Pakistani	Yes	Yes	Not Clear
7	Pakistani	Yes	No	Not Clear
8	Not Pakistani	No	Yes	Not Clear

Strong Robust equivalence class;-

1. **Void check Acadamics (double Mmarks, double Fmarks)**

   Mmarks Class: (50 to 100)
   Fmarks Class: (60 to 100)

   <60,95>|Clear

Test Cases Function 1

Test Cases	Mmarks	Fmarks	ExpectedOutPut
1	60	105	Not Clear
2	70	48	Not Clear
3	110	85	Not Clear
4	35	66	Not Clear
5	102	103	Not Clear
6	40	20	Not Clear
7	115	30	Not Clear
8	10	118	Not Clear
9	75	65	Clear

2. **Void Check Physique (int Age, double Height)**

Age class = 18 to 24

Height class = 5.6 to 7.0

<20,5 .87>|Pass

Test Cases Function 2

Test Cases	Age	Height	ExpectedOutPut
1	23	5.9	Clear
2	20	7.2	Not Clear
3	22	5.3	Not Clear
4	28	5.8	Not Clear
5	15	6.0	Not Clear

6	30	7.9	Not Clear
7	13	4.8	Not Clear
8	35	5.8	Not Clear
9	10	8.8	Not Clear

3. **Void Check_background (String Nationality, String Criminal_Rec., String Married)**

   Nationality = Pakistani, Not Pakistani

   Criminal Rec = Yes, No

   Married = Yes, No

Test Cases Function 3

Test Cases	Nationality	Criminal Rec	Married	Expected Output
1	Pakistani	No	No	Clear
2	Pakistani	Yes	Yes	Not Clear
3	Not Pakistani	Yes	No	Not Clear
4	Pakistani	No	Yes	Not Clear
5	Not Pakistani	No	No	Not Clear
6	Not Pakistani	Yes	Yes	Not Clear
7	Pakistani	Yes	No	Not Clear
8	Not Pakistani	No	Yes	Not Clear

Assignment 3 Contents

For case study selected in Assignment 01

a. List down requirements in form of causes and effects

b. Draw app possible cause effect graphs (can be more than 1 cause-effect graphs)

c. Draw decision table (Tables)

d. Identify test cases

e. Draw a table to mention test case number, test data and expected output

i. Test cases can either be generated by EQP or BVA. Justify your chosen option (between BVA or EQP) with rationale

Function 1 Requirements:

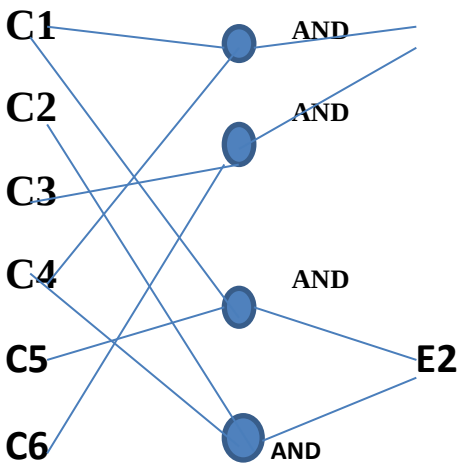
Void check Academics(double Mmarks, double Fmarks)

- If marks of metric are equal to 50% and marks of FSC are equal to 60% then person is clear.
- If marks of metric are greater than 50% and less than 100% and marks of FSC are greater than 60% and less than 100% the person is clear.
- If marks of metric are equal to 50% and marks of FSC less then 60% then person is not clear.
- If marks of metric of person are less than 50% and marks of FSC are 60% then person is not clear.

Causes	Effects
C1: Mmarks = 50%	E1:Clear
C2: Mmarks <50%	E2:Not Clear.
C3: Mmarks>50% and Mmarks <=100%	
C4: Fmarks = 60%	
C5: Fmarks<60%	

C6: Fmarks>60% and Fmarks <=100%

Function 1 Graph:



C1,C4=E1

C3,C6=E1

C1,C5=E2

C2,C4=E2

Decision Table Function 1

		1 2 3 4
Condition/Cause	C1: (Mmarks=50%)	1 0 1 0
Condition/Cause	C2: (Mmarks<50%)	0 0 0 1
Condition/Cause	C3:(Mmarks>50%andMmarks<=100%)	0 1 0 0
Condition/Cause	C4: (Mmarks=60%)	1 0 0 1
Condition/Cause	C5: (Fmarks<60%)	0 0 1 0
Condition/Cause	C6:(Fmarks>60%andFmarks<=100%)	0 1 0 0
Action/Effort	E1: Clear	X X - -
Action/Effort	E2: Not Clear	- - X X

Test Cases Function 1

Test Cases	Mmarks	Fmarks	ExpectedOutPut
1	60	105	Not Clear
2	70	48	Not Clear
3	110	85	Not Clear
4	35	66	Not Clear
5	102	103	Not Clear
6	40	20	Not Clear
7	115	30	Not Clear

8	10	118	Not Clear
9	75	65	Clear

Test cases can either be generated by EQP or BVA. Justify your chosen option (between BVA or EQP) with rationales

- **We used the EQP technique to find out the test cases because in EQP we can guess the input by knowing the output of the cause we can test the every possible output of corresponding input as in this case we applied the strong robust EQP technique to find every possible teat case to test the function properly.**
- **While in BVA we do not have any idea that if we give input than what will be the output of that we provided, We cannot guess the expected output in this case.**

Function 2 Requirements

Void Check Physique (int Age, double Height)

- If Age of a Person is greater than equal to 18 and height is greater than equal to 5.6 than person is clear.
- If age of a person is greater than equal to 18 and less than equal to 24 and height is greater than equal to 5.6 and less than equal to 7.0 then person is clear.
- If age of a person is greater than equal to 18 and Height is less than 5.6 the person is not clear.
- If age of a person is less than 18 and Height is greater equal to 5.6 the person is clear.

Causes:

C1=Age>=18

C2=Age<18

C3=Age>=18 and Age <=24

C4=Height>=5.6

C5=Height<5.6

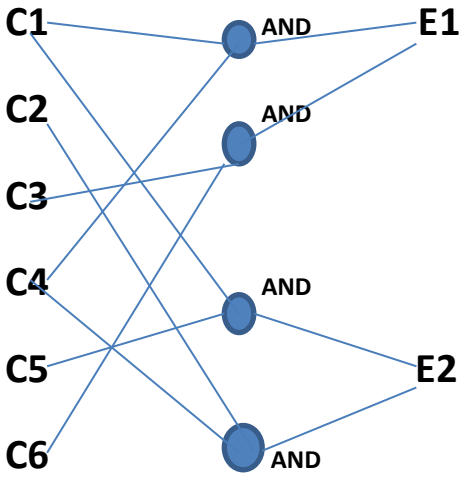
C6=Height>=5.6 and Height <=7.0

Effects

E1=Clear

E2=Not clear

Graph



C1,C4=E1

C3,C6=E1

C1,C5=E2

C2,C4=E2

Decision TableF2

		1 2 3 4
Condition/Cause	**C1:** (Age>=18)	**1 0 1 0**
Condition/Cause	**C2:** (Age<18)	**0 0 0 1**
Condition/Cause	**C3:** (Age>=18 and Age <=24)	**0 1 0 0**
Condition/Cause	**C4:** (Height>=5.6)	**1 0 0 1**
Condition/Cause	**C5:** (Height<5.6)	**0 0 1 0**
Condition/Cause	**C6:** (Height>=5.6 and Height <=7.0)	**0 1 0 0**
Action/Effort	**E1: Clear**	**X X - -**
Action/Effort	**E2: Not Clear**	**- - X X**

Test CasesF2

Test Cases	Age	Height	ExpectedOutPut
1	23	5.9	Clear
2	20	7.2	Not Clear
3	22	5.3	Not Clear
4	28	5.8	Not Clear
5	15	6.0	Not Clear
6	30	7.9	Not Clear
7	13	4.8	Not Clear
8	35	5.8	Not Clear
9	10	8.8	Not Clear

Function 3 Requirements:

Is changed in this Assignment according to feedback of assignment 1.

Void Check_background(String Nationality, String Criminal_Rec., String Married)

- If a person is holding Pakistani nationality with no criminal record
  And the person is unmarried then the person is clear.
- If the person is holding Pakistani nationality with any criminal record (minor or major) and is unmarried, then person is not clear.
- If the person is holding Pakistani nationality with no criminal record (minor or major) and is married the person is not clear.
- If the person is not holding Pakistani nationality with no criminal record (minor or major) and is unmarried the person is not clear.

Causes:

C1: Nationality=Pakistani

C2: Nationality=Not Pakistani

C3: Criminal Rec=Yes

C4: Criminal Rec =No

C5: Married=Yes

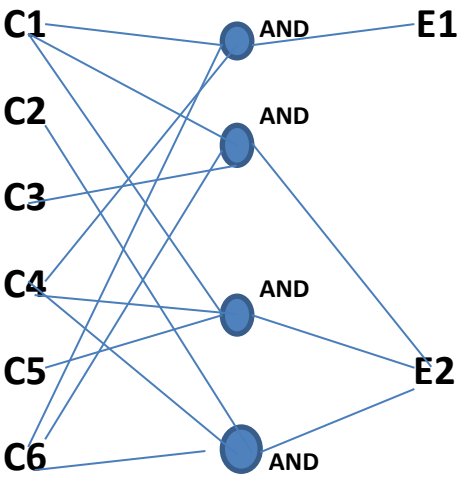
C6: Married=No

Effects

E1: Clear

E2: Not clear

GraphF3



C1,C4,C6=E1

C1,C3,C6=E2

C1,C4,C5=E2

C2,C4,C6=E2

Decision TableF3

		1 2 3 4
Condition/Cause	**C1: (**Nationality=Pakistani)	**1 1 1 0**
Condition/Cause	**C2: (**Nationality=Not Pakistani)	**0 0 0 1**
Condition/Cause	**C3: (Yes)**	**0 1 0 0**
Condition/Cause	**C4: (No)**	**1 0 1 1**
Condition/Cause	**C5: (Yes)**	**0 0 1 0**
Condition/Cause	**C6: (No)**	**1 1 0 1**
Action/Effort	**E1: Clear**	**X - - -**
Action/Effort	**E2: Not Clear**	**- X X X**

Test CasesF3

Test Cases	Nationality	Criminal Rec	Married	Expected Output
1	**Pakistani**	**No**	**No**	**Clear**
2	**Pakistani**	**Yes**	**Yes**	**Not Clear**
3	**Not Pakistani**	**Yes**	**No**	**Not Clear**
4	**Pakistani**	**No**	**Yes**	**Not Clear**
5	**Not Pakistani**	**No**	**No**	**Not Clear**
6	**Not Pakistani**	**Yes**	**Yes**	**Not Clear**
7	**Pakistani**	**Yes**	**No**	**Not Clear**
8	**Not Pakistani**	**No**	**Yes**	**Not Clear**