|  |
| --- |
|  |

|  |
| --- |
| **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** |
|  |
|  |
|  |

Table of Contents

[Summary of Changes 2](#_Toc55252561)

[CASE STUDY 3](#_Toc55252562)

[Assignment 1 and 2 Contents 4](#_Toc55252563)

[Test Cases Function 1 4](#_Toc55252564)

[Test Cases Function 2 5](#_Toc55252565)

[Test Cases Function 3 6](#_Toc55252566)

[Strong Robust equivalence class;- 7](#_Toc55252567)

[Test Cases Function 1 7](#_Toc55252568)

[Test Cases Function 2 7](#_Toc55252569)

[Test Cases Function 3 8](#_Toc55252570)

[Assignment 3 Contents 9](#_Toc55252571)

[Function 1 Requirements 9](#_Toc55252572)

[Causes Effects 9](#_Toc55252573)

[Function 1 Graph: 10](#_Toc55252574)

[Decision Table Function 1 10](#_Toc55252575)

[Test Cases Function 1 10](#_Toc55252576)

[Test cases can either be generated by EQP or BVA. Justify your chosen option (between BVA or EQP) with rationales 11](#_Toc55252577)

[Function 2 Requirements 11](#_Toc55252578)

[Causes: Effects 11](#_Toc55252579)

[Graph 12](#_Toc55252580)

[Decision TableF2 12](#_Toc55252581)

[Test CasesF2 12](#_Toc55252582)

[Function 3 Requirements: 13](#_Toc55252583)

[Causes: Effects 14](#_Toc55252584)

[GraphF3 14](#_Toc55252585)

[Decision TableF3 14](#_Toc55252586)

[Test CasesF3 15](#_Toc55252587)

# 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 | |
|  |  |  |  |  |
|  |  | **(Problem Statement)** | | |

Each year many people apply to join the Army as an  [**Officer**](https://www.how2become.com/army-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** |

1. **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** |

1. **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** |

1. **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** |

1. **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 AND E1 C1,C4=E1**

**C2 AND C3,C6=E1**

**C3 C1,C5=E2**

**C4 AND C2,C4=E2**

**C5 E2**

**C6 AND**

## 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: Effects

C1=Age>=18 E1=Clear

C2=Age<18 E2=Not clear

C3=Age>=18 and Age <=24

C4=Height>=5.6

C5=Height<5.6

C6=Height>=5.6 and Height <=7.0

## Graph

**C1 AND E1 C1,C4=E1**

**C2 AND C3,C6=E1**

**C3 C1,C5=E2**

**C4 AND C2,C4=E2**

**C5 E2**

**C6 AND**

## 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: Effects

C1: Nationality=Pakistani E1: Clear

C2: Nationality=Not Pakistani E2: Not clear

C3: Criminal Rec=Yes

C4: Criminal Rec =No

C5: Married=Yes

C6: Married=No

## GraphF3

**C1 AND E1 C1,C4,C6=E1**

**C2 AND C1,C3,C6=E2**

**C3 C1,C4,C5=E2**

**C4 AND C2,C4,C6=E2**

**C5 E2**

**C6 AND**

## 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** |