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| Capital university of science and technolgy |
| Software Testing A2 |
| Black box testing |
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1. **Choose any problem statement of your choice and do following.**
   1. **Explain the case study of the problem (minimum 400 words)**
   2. **Identify the functions (at least 3) from the case study and there must me at least one function that takes 3 parameters**
   3. **Black box Testing**
      1. **Using worst case BVA, identify test cases of the program**
      2. **Implement 50% of test cases of each function**
      3. **Using strong robust equivalence classes, identify test cases of the program and number of reduced test cases as compare to robust worst case BVA.**

**Part A**

University management system that allow university to manage university activities easily. Such as admission, fee system, attendance system etc. In university different activities occur, at the time of admission university have to calculate aggregate of student and prepare merit list. University have admission criteria student must be fulfill these admission criteria. AL teat 50% marks in Matric, FSC marks and in admission test. Student must be 50% marks in on order to pass the subject. Student can pay fee and fine at the start of semester. University Management system have student portal system that allow student to view their education record of semester and it allow student to view their fine, course, payments etc. This system also have teacher portal that allow teacher to marks attendance of students, upload assignments, quizzes marks etc. There is examination system that manage the exam in university.

University has admission criteria. AL teat 50% marks in Matric, FSC marks and in admission test are required in order to get admission in university. University prepare merit list by calculating student aggregate. Student must be 50% marks in on order to pass the subject. There is midterm of weightage 20%, final term of weightage 40%, and other 40% number contain quizzes, assignments, project depend upon courses and teachers. Normally quizzes contain 20% and assignment contain 20% of marks. University have attendance criteria. Maximum 8 leave allow per subject. There is no fine in first your leave and 200 hundred rupee fine per leave.

**Part B**

**F1**

int calculateAggeagate( matricMarks, fscMarks, admissionTestMarks)

MatricMarks range 50%-100% 20% consider

fscMarks range 50%-100% 30% consider

admissionTestMarks range range 50%-100% 50% consider

**F2**

int calculateFinalResult(mid, final, others)

mid range 0-20

final range 0-40

others range 0-40

**F3**

int fineCalculate(leave)

leave range 0-8

**Part C**

**Black box testing**

**Function 1**

int calculateAggeagate( matricMarks, fscMarks, admissionTestMarks)

**testcase 5^3=125**

admissionTestMarks

min = 50 min+=51 normal=75 max-=99 max=100

fscMarks

min = 50 min+=51 normal=70 max-=99 max=100

admissionTestMarks

min = 50 min+=51 normal=76 max-=99 max=100

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| --- | --- | --- | --- | --- |
| **Case** | **matricMarks** | **fscMarks** | **admissionTestMarks** | **Expected Output** |
| 1 | 50 | 50 | 50 | 50 |
| 2 | 50 | 50 | 51 | 50.5 |
| 3 | 50 | 50 | 76 | 63 |
| 4 | 50 | 50 | 99 | 74.5 |
| 5 | 50 | 50 | 100 | 75 |
| 6 | 50 | 51 | 50 | 50.3 |
| 7 | 50 | 51 | 51 | 50.8 |
| 8 | 50 | 51 | 76 | 63.3 |
| 9 | 50 | 51 | 99 | 74.8 |
| 10 | 50 | 51 | 100 | 75.3 |
| 11 | 50 | 70 | 50 | 56 |
| 12 | 50 | 70 | 51 | 56.5 |
| 13 | 50 | 70 | 76 | 69 |
| 14 | 50 | 70 | 99 | 80.5 |
| 15 | 50 | 70 | 100 | 81 |
| 16 | 50 | 99 | 50 | 64.7 |
| 17 | 50 | 99 | 51 | 65.2 |
| 18 | 50 | 99 | 76 | 77.7 |
| 19 | 50 | 99 | 99 | 89.2 |
| 20 | 50 | 99 | 100 | 89.7 |
| 21 | 50 | 100 | 50 | 65 |
| 22 | 50 | 100 | 51 | 65.5 |
| 23 | 50 | 100 | 76 | 78 |
| 24 | 50 | 100 | 99 | 89.5 |
| 25 | 50 | 100 | 100 | 90 |
| 26 | 51 | 50 | 50 | 50.2 |
| 27 | 51 | 50 | 51 | 50.7 |
| 28 | 51 | 50 | 76 | 63.2 |
| 29 | 51 | 50 | 99 | 74.7 |
| 30 | 51 | 50 | 100 | 75.2 |
| 31 | 51 | 51 | 50 | 50.5 |
| 32 | 51 | 51 | 51 | 51 |
| 33 | 51 | 51 | 76 | 63.5 |
| 34 | 51 | 51 | 99 | 75 |
| 35 | 51 | 51 | 100 | 75.5 |
| 36 | 51 | 70 | 50 | 56.2 |
| 37 | 51 | 70 | 51 | 56.7 |
| 38 | 51 | 70 | 76 | 69.2 |
| 39 | 51 | 70 | 99 | 80.7 |
| 40 | 51 | 70 | 100 | 81.2 |
| 41 | 51 | 99 | 50 | 64.9 |
| 42 | 51 | 99 | 51 | 65.4 |
| 43 | 51 | 99 | 76 | 77.9 |
| 44 | 51 | 99 | 99 | 89.4 |
| 45 | 51 | 99 | 100 | 89.9 |
| 46 | 51 | 100 | 50 | 65.2 |
| 47 | 51 | 100 | 51 | 65.7 |
| 48 | 51 | 100 | 76 | 78.2 |
| 49 | 51 | 100 | 99 | 89.7 |
| 50 | 51 | 100 | 100 | 90.2 |
| 51 | 75 | 50 | 50 | 55 |
| 52 | 75 | 50 | 51 | 55.5 |
| 53 | 75 | 50 | 76 | 68 |
| 54 | 75 | 50 | 99 | 79.5 |
| 55 | 75 | 50 | 100 | 80 |
| 56 | 75 | 51 | 50 | 55.3 |
| 57 | 75 | 51 | 51 | 55.8 |
| 58 | 75 | 51 | 76 | 68.3 |
| 59 | 75 | 51 | 99 | 79.8 |
| 60 | 75 | 51 | 100 | 80.3 |
| 61 | 75 | 70 | 50 | 61 |
| 62 | 75 | 70 | 51 | 61.5 |
| 63 | 75 | 70 | 76 | 74 |

**Function 2**

int calculateFinalResult(mid, final, others)

**testcase 5^3=125**

mid

min = 0 min+=1 normal=10 max-=19 max=20

final

min = 0 min+=1 normal=20 max-=39 max=40

others

min = 0 min+=1 normal=20 max-=39 max=40

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Case** | **mid** | **final** | **others** | **Expected Output** |
| 1 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 1 | 1 |
| 3 | 0 | 0 | 20 | 20 |
| 4 | 0 | 0 | 39 | 39 |
| 5 | 0 | 0 | 40 | 40 |
| 6 | 0 | 1 | 0 | 1 |
| 7 | 0 | 1 | 1 | 2 |
| 8 | 0 | 1 | 20 | 21 |
| 9 | 0 | 1 | 39 | 40 |
| 10 | 0 | 1 | 40 | 41 |
| 11 | 0 | 20 | 0 | 20 |
| 12 | 0 | 20 | 1 | 21 |
| 13 | 0 | 20 | 20 | 40 |
| 14 | 0 | 20 | 39 | 59 |
| 15 | 0 | 20 | 40 | 60 |
| 16 | 0 | 39 | 0 | 39 |
| 17 | 0 | 39 | 1 | 40 |
| 18 | 0 | 39 | 20 | 59 |
| 19 | 0 | 39 | 39 | 78 |
| 20 | 0 | 39 | 40 | 79 |
| 21 | 0 | 40 | 0 | 40 |
| 22 | 0 | 40 | 1 | 41 |
| 23 | 0 | 40 | 20 | 60 |
| 24 | 0 | 40 | 39 | 79 |
| 25 | 0 | 40 | 40 | 80 |
| 26 | 1 | 0 | 0 | 1 |
| 27 | 1 | 0 | 1 | 2 |
| 28 | 1 | 0 | 20 | 21 |
| 29 | 1 | 0 | 39 | 40 |
| 30 | 1 | 0 | 40 | 41 |
| 31 | 1 | 1 | 0 | 2 |
| 32 | 1 | 1 | 1 | 3 |
| 33 | 1 | 1 | 20 | 22 |
| 34 | 1 | 1 | 39 | 41 |
| 35 | 1 | 1 | 40 | 42 |
| 36 | 1 | 20 | 0 | 21 |
| 37 | 1 | 20 | 1 | 22 |
| 38 | 1 | 20 | 20 | 41 |
| 39 | 1 | 20 | 39 | 60 |
| 40 | 1 | 20 | 40 | 61 |
| 41 | 1 | 39 | 0 | 40 |
| 42 | 1 | 39 | 1 | 41 |
| 43 | 1 | 39 | 20 | 60 |
| 44 | 1 | 39 | 39 | 79 |
| 45 | 1 | 39 | 40 | 80 |
| 46 | 1 | 40 | 0 | 41 |
| 47 | 1 | 40 | 1 | 42 |
| 48 | 1 | 40 | 20 | 61 |
| 49 | 1 | 40 | 39 | 80 |
| 50 | 1 | 40 | 40 | 81 |
| 51 | 10 | 0 | 0 | 10 |
| 52 | 10 | 0 | 1 | 11 |
| 53 | 10 | 0 | 20 | 30 |
| 54 | 10 | 0 | 39 | 49 |
| 55 | 10 | 0 | 40 | 50 |
| 56 | 10 | 1 | 0 | 11 |
| 57 | 10 | 1 | 1 | 12 |
| 58 | 10 | 1 | 20 | 31 |
| 59 | 10 | 1 | 39 | 50 |
| 60 | 10 | 1 | 40 | 51 |
| 61 | 10 | 20 | 0 | 30 |
| 62 | 10 | 20 | 1 | 31 |
| 63 | 10 | 20 | 20 | 50 |

**F3**

int fineCalculate(leave)

**testcase 5^1=5**

min = 0 min+=1 normal=5 max-=7 max=8

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| --- | --- | --- |
| **Case** | **leave** | **Expected Output** |
| 1 | 0 | 0 |
| 2 | 1 | 0 |
| 3 | 5 | 200 |
| 4 | 7 | 600 |
| 5 | 8 | 800 |

**Part C**

**Using strong robust equivalence classes, identify test cases of the program and number of reduced test cases as compare to robust worst case BVA.**

**Function 1**

**Test case 15**

**Condition**

MatricMarks range 50%-100% below 40 above 120

fscMarks range 50%-100% below 40 above 120

admissionTestMarks range range 50%-100% below 40 above 120

**Function 2**

**Test case 15**

**Condition**

Mid range 0-20 below -3 above 25

final range 0-40 below -6 above 75

others range 0-40 below -6 above 75

**Function 3**

**Test case 3**

**Condition**

Leave 0-8 below -5 above 9

**comparison**

**function 1 and 2**

**15 test cases of** strong robust equivalence class and **test cases 7^3=243** robust worst case BVA