VAAL UNIVERSITY OF TECHNOLOGY

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Faculty of Applied and Computer Sciences

ICT Department

ASDSY2A / EIENP4A – Java Programming

Unit2: GA Assignments Practical

Examiner: RT Mngoma **Moderator:** Mr M Kies

Due Date: 10 October 2022 **Time:** 23h00

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1. Write a program that will do the following:
   # A program that reads a sequence of numbers
   # and counts how many numbers are even and how many are odd.
   # The program terminates when zero is entered.
   # Use a while loop and if statements accordingly

   SAMPLE OUTPUT
   Enter a number or type 0 to stop: 5
   Enter a number or type 0 to stop: 2
   Enter a number or type 0 to stop: 9
   Enter a number or type 0 to stop: 1
   Enter a number or type 0 to stop: 12
   Enter a number or type 0 to stop: 15
   Enter a number or type 0 to stop: 0
   Odd numbers count: 4
   Even numbers count: 2

2. Write a program to create function **perfect_number()** to check whether a number is perfect or not, it must passes **n value** as parameter.

   a perfect number is a number that is half the sum of all of its positive divisors (including itself).

Example : The first perfect number is 6, because 1, 2, and 3 are its proper positive divisors, and 1 + 2 + 3 = 6.
Equivalently, the number 6 is equal to half the sum of all its positive divisors: (1 + 2 + 3 + 6) / 2 = 6.
The next perfect number is 28 = 1 + 2 + 4 + 7 + 14.

SAMPLE OUTPUT
Enter Perfect No:28
28 is perfect number

if not

Enter Perfect No:36
36 is not perfect number

3. Write a program to create function countString_Words( )that accepts a string var as parameter and calculate the number of words in a string sentence. And also create a function to countAllChars()that accepts a string var as parameter and calculate the number of all characters in a string sentence, excluding empty spaces.
   It must get string value from user. Invoke your functions accordingly.
   SAMPLE OUTPUT
   Input the string: Java String provides various methods to perform different operations on strings
   Number of words in the string: 11
   Number of chars in the string: 69

4. Write a code using a for loop from a range between 1 and 10 that will print only even numbers
   SAMPLE OUTPUT
   2
   4
   6
   8

5. Write a code to find the smallest number, use while loop and if statements accordingly. it must get number from the user, and the loop can only stop when user enter -1
   SAMPLE OUTPUT
   Enter a number or type -1 to stop: 5
   Enter a number or type -1 to stop: 15
   Enter a number or type -1 to stop: 3
   Enter a number or type -1 to stop: 95
   Enter a number or type -1 to stop: 8
   Enter a number or type -1 to stop: -1
   The smallest number is: 3

6. Create a java class called **Student** with the following:

- **Instance variables**: name, subjectcode, test1, test2, test3,
- Contructors: a default constructor and an overloaded parameterized constructor – it must call all the class setters (mutators) methods.
- Getters and Setters: code setter (mutators) and getter(accessors) methods for all class instance variables.

Raise/Throw exceptions for the following conditions:

- If name and subjectcode is less than 3 characters' long
- If test1, test2, test3 **are negative**.

- The function called calcSemesterMark() that receive test1, test2 and test3 as parameters and return calculated Semester mark. To calculate semester mark, you must divide the total of all 3 tests by 3
- The function called calcFinalMark() that receive examMark and semesterMark as parameters and return calculated FinalMark. To calculate final mark, you must divide the total of both examMark and semesterMark by 2
- A toString() method that returns all the instance variables in one line, separated by tabs.

- Create a JFrame class called **StudentForm** and design a form as shown **fig1**, populate the combobox items with the subject code:
  ASDSY2A
  EIENP4A
  AIBAY2A
  AIWMY2A
- The button Process Stud event should perform the following functionalities: Handle exception accordingly and error message must be displayed in a messagebox, see **fig5a** and **fig5b**
  - Get the inputs for all instance variables from their respective TextFields(textboxes) and combobox, and some input must be converted accordingly, see screenshot from **fig2 .**
  - Instantiate an object of the Student class - Invoke calcSemesterMark() function from Student class and pass correct parameters, it must validate semester mark to check if student qualify for exam: a student must have semester mark of 50 and above to qualify. If student qualify you must get exam mark input, using inputbox (**fig3**), then invoke calcFinalMark method to calculate final mark. If student don't qualify, it must display an error message with a student semester mark in a messagebox. **See fig2**
  - It must also validate final mark and assign mark status as follows:
  - If final mark is greater or equal to 75, status must be **PD**

- If final mark is greater or equal to 50 but less than 75, status must be **P**
- If final mark is less than 50, status must be **F**
- If final mark is greater or equal to 50 but exam mark is less than 40, status must be **FM**

- Display output in TextArea as shown in screenshot below. It must have correct headings with proper tabs, Invoke (call) the toString() method to display all class attribute, also display exammark, calculated semester mark, calculated final mark and mark status, make sure all your values are separated by tabs. **See fig4a** and **fig4b**

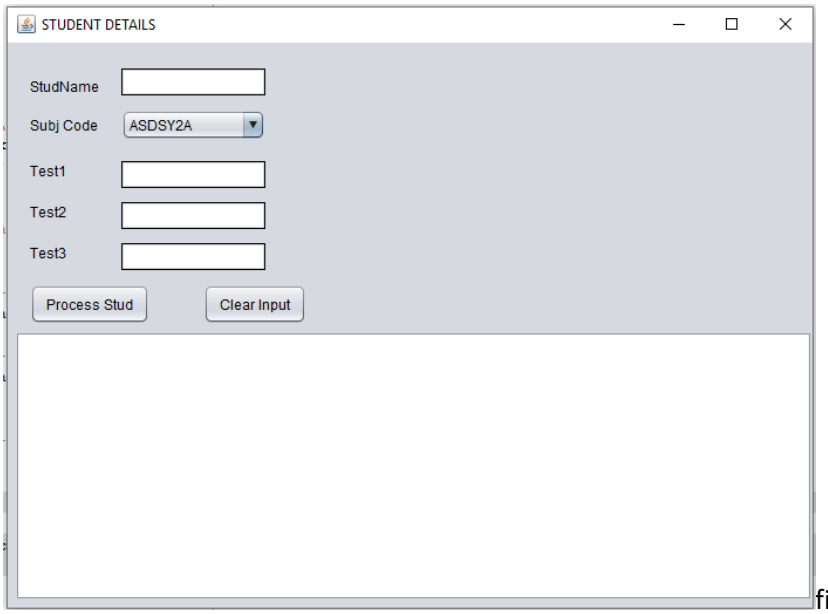


fig1

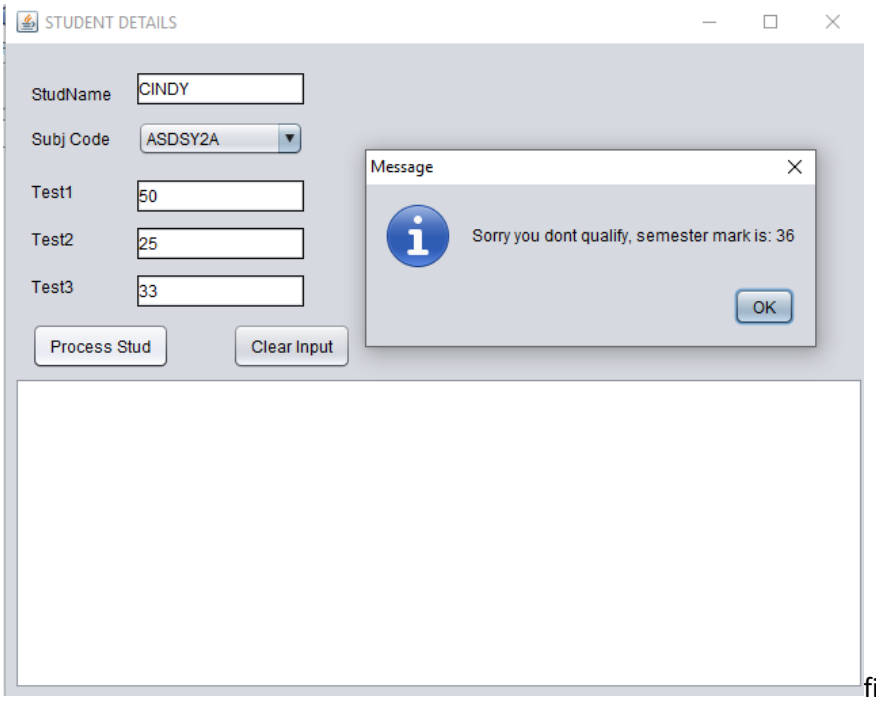
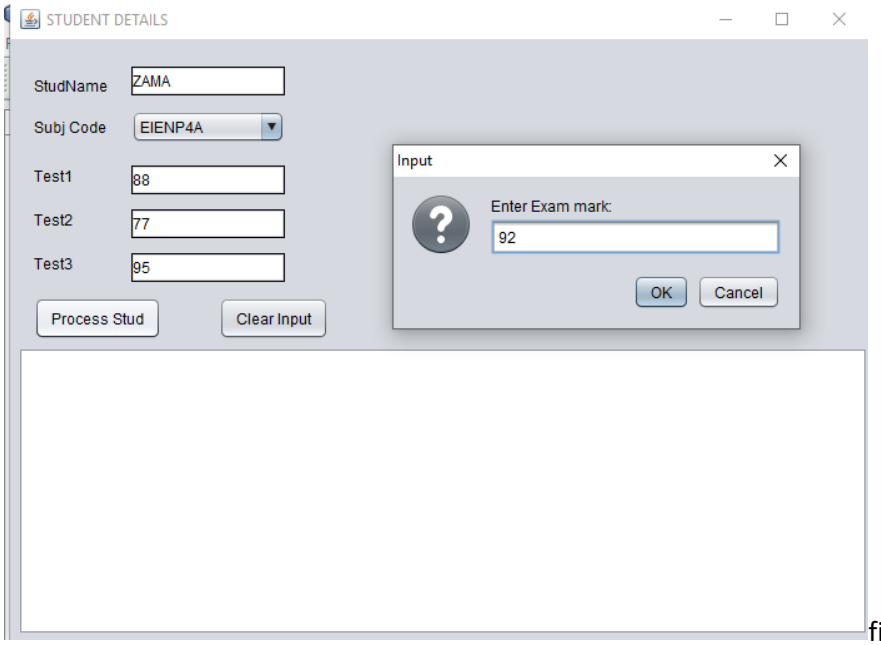
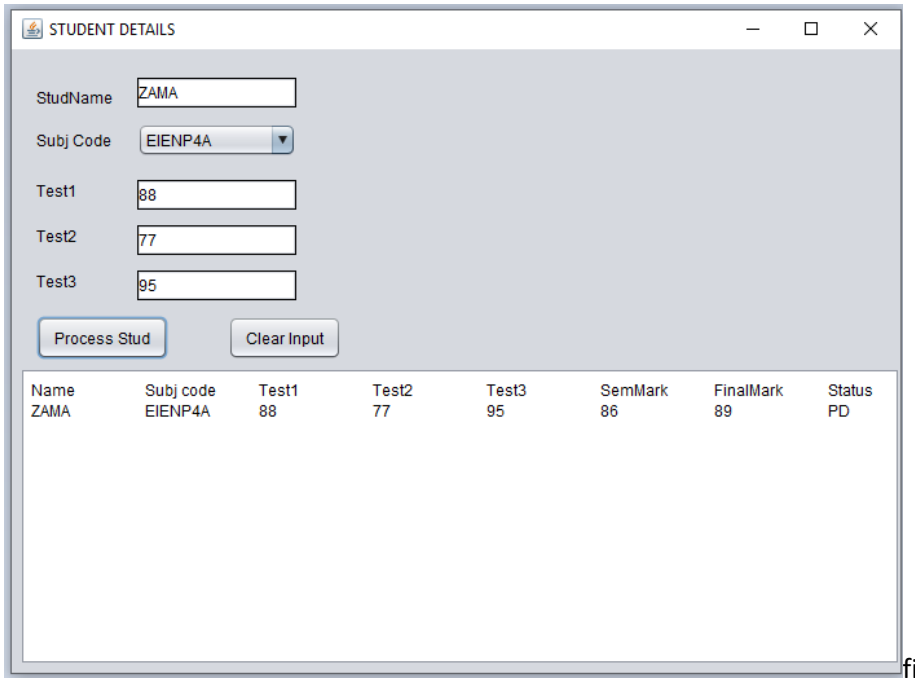
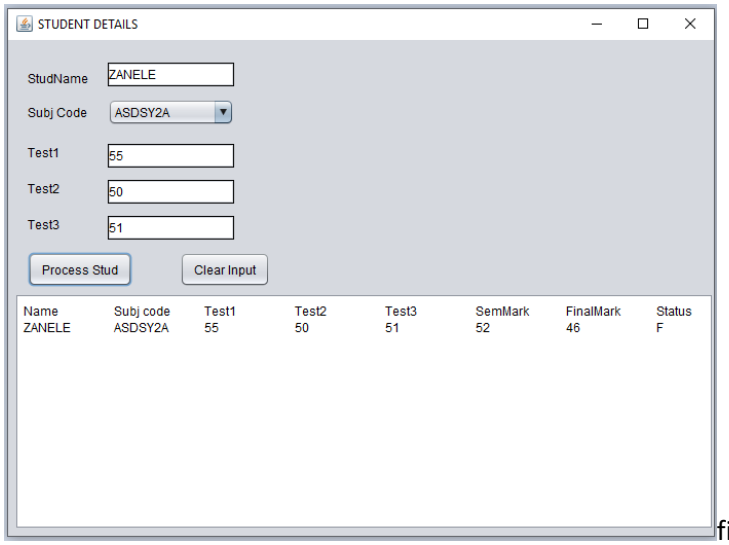
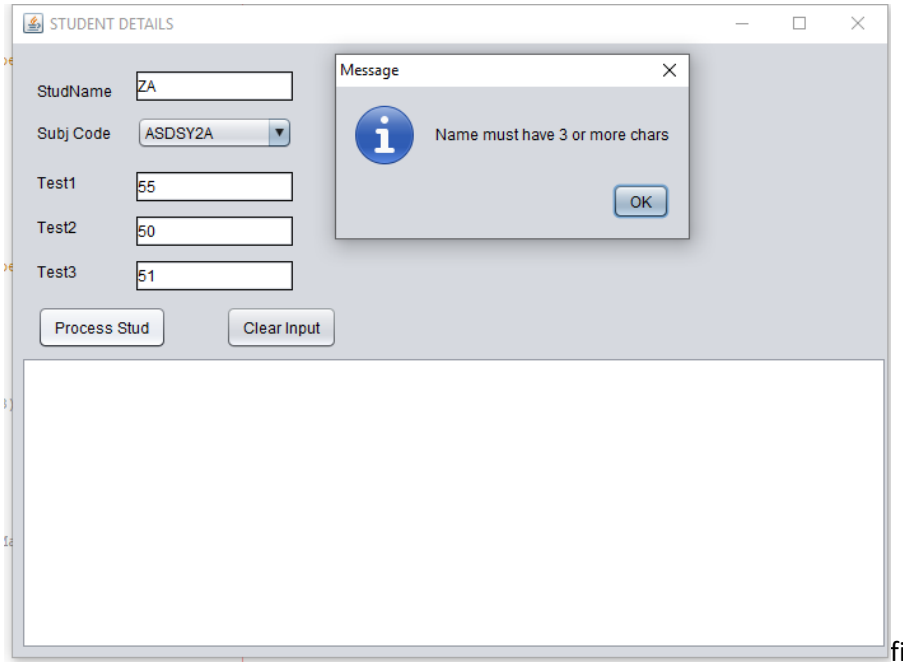


fig2


STUDENT DETAILS
StudName
ZAMA
Subj Code
EIENP4A
Test1
88
Test2
77
Test3
95
Process Stud
Clear Input
Input
Enter Exam mark:
92
OK
Cancel
fig3


STUDENT DETAILS
StudName
ZAMA
Subj Code
EIENP4A
Test1
88
Test2
77
Test3
95
Process Stud
Clear Input
Name Subj code Test1 Test2 Test3 SemMark FinalMark Status
ZAMA EIENP4A 88 77 95 86 89 PD
fig4a


STUDENT DETAILS
StudName
ZANELE
Subj Code
ASDSY2A
Test1
55
Test2
50
Test3
51
Process Stud
Clear Input
Name
Subj code
Test1
Test2
Test3
SemMark
FinalMark
Status
ZANELE
ASDSY2A
55
50
51
52
46
F
fig4b


STUDENT DETAILS
StudName
ZA
Subj Code
ASDSY2A
Test1
55
Test2
50
Test3
51
Process Stud
Clear Input
Message
Name must have 3 or more chars
OK
fig5a

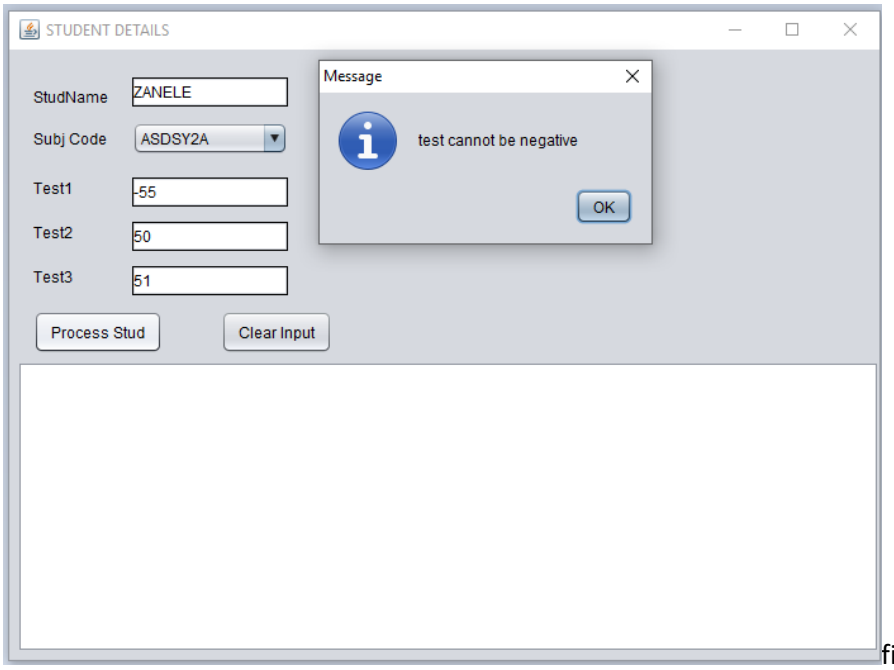


fig5b

**************END GA ASSIGNMENT – GOOD LUCK*************