

COSC 1437 – PROJECT

# TITLE

File access – Array Access – User-defined function - Student Grading

# HOW TO DO PROJECT

\*From now and on yourLastName will be changed to your last name.

\*Your program should change White to your last name.

\*Your program should change JAMES SMITH to your name.

\*Change Mary Lane to the name of user who is using the Investment Application entered from the keyboard*.*

\*Write the file name as the first comment line at the top of the program*.*

\*After running your program, get the picture of the output window from your program with your name on to paste at the bottom of the pseudo-code to turn in.

\*Step1: Read the requirement of each part; create the UML of data type class, write the pseudo-code of driver class in a word document by listing the step by step what you suppose to do in main() and then save it with the name as Project\_pseudoCode\_yourLastName*.*

\*Step2:

-start editor (for example eclipser) create the project with the following project name:

FA2022\_PROJECT\_yourLastName

-add data type class:

FA2022\_Student\_yourLastName

-add a driver class (that contain main()

FA2022\_16WeeksGradingApplication\_yourLastName

\*Step3: follow step by step in the pseudo-code (or the flowchart) to write the java codein main() or driver class.

\*Step:4 compile and run the program*.*

\*Step5: debug if there are any errors to complete the program.

# PROJECT requirement

Use Java to provide the application that helps to calculate the numeric grade and determine the letter grade of students based on the scores of 7 assignment types: quizzes, homework, labs, project, discussion topic, teamwork, tests, and policy quiz is an extra credit.

The project focuses on the information of students; therefore, we can select the data type class about Student.

**DATA TYPE CLASS**

Class FA2022\_Student\_yourLastName.java

-The class should hold the information relating to this project: course name, student name, student id, extra credit score, total max score.

And the following arrays:

* String array assignment\_names with size 7
* float array **studentScores** with size 7 that stores the total scores of 7 assignment types of the student.
* String array studentScoreString with size 7 that stores the list of scores of 7 assignment types of student

The index of these arrays will store the following:

Index 0: store information of quizzes

Index 1: store information of homework

Index 2: store information of labs

Index 3: store information of project

Index 4: store information of teamwork

Index 5: store information of topics

Index 6: store information of tests

Also, the data type class will include:

-no-argument constructor, parameterized constructor: the course name, student name, student id, extra credit score, array assignmentNames, array studentScores and studentScoreString will be read from the main().

total max score = sum of all values in 7 elements in7 elements of the max score array

-method to calculate the total of student scores by using the following formula:

total student scores = sum of all values in 7 elements of the student scores array + extra credit

-method to calculate numeric grade with the following formula:

Numeric grade = 100 \* total scores of student / total max score

-method to determine letter grade based on the following table

| Letter Grade | Numeric grade |
| --- | --- |
| A | Numeric grade >= 90 |
| B | Numeric grade >= 80 |
| C | Numeric grade >= 70 |
| D | Numeric grade >= 60 |
| F | Numeric grade < 60 |

-method toString() to create the output string in the following format:

FA2022\_16WeekGradingApplication\_Smith.java

FINAL GRADE OF STUDENT - JAMES SMITH

--------------------------------------------------------------------------------------

COURSE NAME: COSC1437

STUDENT ID: 1122334

NAME: Mary Lane

--------------------------------------------------------------------------------------

POLICY QUIZ 5.0

Quiz 4.5 3.25 2.75 5.0 5.0 4.25 5.0 2.25 4.5 5.0 2.5 3.5 4.0 4.5

Homework 7.5 8.0 9.5 10.0 10.0 7.5 9.25 9.0 8.75 10.0

Lab 27.0 25.5 22.5 28.0 22.25 25.5 30.0

Project 65.0

Teamwork 20.0

Topic 20.0

Test 75.0 82.5 78.25

--------------------------------------------------------------------------------------

Total STUDENT Score: 672.00

Total MAX core: 800.00

Numeric Grade: 84.00

Letter Grade: B

--------------------------------------------------------------------------------------

-**method toFile()** to create the string to write the output file in the following format:

courseName, studentID, student name, numeric grade, letter grade, 1 policy score, 14 quizzes scores, 10 homework scores, 7 lab scores, 1 project score, 1 teamwork score, 1 topic score, 3 assess scores

For example:

COSC1436,1234567,Mary Lane**,**84.00,B,5.0 ,4.5 3.25 2.75 5.05.0 4.25 5.0 2.25 4.5 5.0 2.5 3.5 4.0 4.5 ,7.5 8.0 9.5 10.010.0 7.5 9.25 9.0 8.75 10.0 ,27.0 25.5 22.5 28.022.25 25.5 30.0 ,65.0 ,20.0 ,20.0 ,75.0 82.5 78.25

**-method shortOutput()** to create the output string in the following format:

STUDENT: 1111111

NAME: Isra Ahmed

Numeric Grade: 78.76

Letter Grade: C

**DRIVER CLASS**

Class FA2022\_16WeeksGrading\_yourLastName.java

Provide the pseudo-code and the application to help users to calculate the numeric grade and determine letter grade of students.

**FIRST, declare** the following array with size 7 to hold the information

* String[ ] assignmentNames = {“Quiz”, “Homework”, “Lab”, “Project”, “Teamwork”, “Topic”, “Test”}
* array assignmentSizes of int to store the how many scores of each assignment
* array maxScores of float to store total max score or each assignment

Where:

The index of these arrays will store the following:

Index 0: store information of quizzes

Index 1: store information of homework

Index 2: store information of labs

Index 3: store information of project

Index 4: store information of teamwork

Index 5: store information of topics

Index 6: store information of tests

**THEN, use the for loop that iterates 7 times to do the following**:

\***display the list** of the assignment names as below and ask users to enter the number to select the names of the assignments that participate in grading.

FA2022\_16WeeksGradingApplication\_Smith.java

LIST OF ASSIGNMENTS – JAMES SMITH

--------------------------------------------------------------------

1.QUIZ

2.HOMEWORK

3.LAB

4.PROJECT

5.TEAMWORK

6.TOPIC

7.TEST

0.EXIT

**Read the number** that users type in:

-If the number is 0 then quit the for loop

-If the number is not 0 then continue read the following information:

\***How many scores of the selected assignment**?

For example: if users select number = 1 that means QUIZ, then ask: How many QUIZ scores? The answer will be stored in the array assignmentSizes at index = (number – 1) = 0

\***Continue ask: What is max score**?

For example, if users select number = 1 that means QUIZ, then ask: What is the max score of one QUIZ? The answer **max** will be used to calculate as follows: max = max \* assignmentSize at index = (number -1) = 0 and store max at the index = 0 of the array maxScores

**NEXT,** display the Menu to allow users to select a task:

FA2022\_16WeeksGradingApplication\_Smith.java

TASK OF GRADING – JAMES SMITH

--------------------------------------------------------------------

1.Grading One Student

2.Printing The Grade of One Student from input file

3.Printing The Grades of Class

0.Exit

## TASK1: GRADING ONE STUDENT

-**Read information and scores** from the keyboard for the following information:

\*The course name,

\*student id,

\*student name

\* all the scores of 7 assignment types and extra credit (POLICY QUIZ) of one student are provided from the keyboard.

-**Create the object** of data type class FA2022\_Student\_yourLastName

-Use the object to access the method toString() to display the grade of the student

-**WRITE TO FILE studentGrade.txt:** open file, use the object to access the method toFile() of data type class to

Get the string to write one line in the file. Close file

## TASK2: DISPLAYING THE GRADE OF ONE STUDENT FROM FILE

-Ask the ID that users want to read the grade that is entered from the keyboard

-Read from the input file studentGrades.txt;

-for each line, split information to get student id then Compare student id to ID read from the keyboard above

If it matches, split the information on that line into courseName, studentId, studentName, numeric grade, letter grade, policy score, quizzes scores, homework scores, lab scores, project score, teamwork score, topic score, test scores

-create the object of class FA2022\_Student\_yourLastName to pass all these information in

-use the object to access the method in class FA2022\_Student\_yourLastName to print the grade of student with ID in the following format:

FA2022\_16WeekGradingApplication\_Smith.java

FINAL GRADE OF STUDENT - JAMES SMITH

--------------------------------------------------------------------------------------

COURSE NAME: COSC1437

STUDENT ID: 1122334

NAME: Mary Lane

--------------------------------------------------------------------------------------

POLICY QUIZ 5.0

Quiz 4.5 3.25 2.75 5.0 5.0 4.25 5.0 2.25 4.5 5.0 2.5 3.5 4.0 4.5

Homework 7.5 8.0 9.5 10.0 10.0 7.5 9.25 9.0 8.75 10.0

Lab 27.0 25.5 22.5 28.0 22.25 25.5 30.0

Project 65.0

Teamwork 20.0

Topic 20.0

Test 75.0 82.5 78.25

--------------------------------------------------------------------------------------

Total STUDENT Score: 672.00

Total MAX core: 800.00

Numeric Grade: 84.00

Letter Grade: B

--------------------------------------------------------------------------------------

## TASK3: DISPLAYING THE GRADES OF ONE CLASS

-Read the grades stored in the file studentGrades.txt at TASK1

-For each line, split information to courseName, studentId, last name, first name, numeric grade, letter grade, policy score, quizzes scores, homework scores, lab scores, project score, teamwork score, topic score, test scores

-create the object of class FA2022\_Student\_yourLastName to pass all these information to the object

-use the object to access the method to print class grades in the following format:

FA2022\_16WeeksGradingApplication\_Smith.java

LIST OF STUDENTS' GRADES - JAMES SMITH

---------------------------------------------

STUDENT: 1111111

NAME: Isra Ahmed

Numeric Grade: 78.76

Letter Grade: C

---------------------------------------------

STUDENT: 2222222

NAME: Jawad Ahmed

Numeric Grade: 79.57

Letter Grade: C

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STUDENT: 3333333

NAME: Adje Akoi

Numeric Grade: 79.74

Letter Grade: C

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# HOW TO TURN IN THE LAB

The UML of data type class, the pseudo-code of main(), output pictures

Following files:

FA2022\_Student\_yourLastName.java

FA2022\_16WeeksGradingApplication\_yourLastName.java

FA2022\_Student\_yourLastName.class

FA2022\_16WeeksGradingApplication\_yourLastName.class

# HOW TO GRADE THE PROJECT

| TURN IN ON TIME | 10 |
| --- | --- |
| Submit all the requested files, with correct names |  |
| Compile success – qualify the requirements | 10 |
| Write comments in the program | 4 |
| UML and Pseudo-code or flowchart in the file named project\_yourLastName.doc | 6 |
| Having at least 3 user-defined functions | 6 |
| Class F2021\_Student\_LastName |  |
| data members | 2 |
| No-argument Constructor – parameter constructor | 4 |
| Method toString() | 2 |
| Method to calculate sum of assignments scores, sum of max scores | 3 |
| Method to calculate the percentage and determine the letter grade | 3 |
| Method to create output of task1 | 2 |
| Method to create output of task2 | 2 |
| Method to create output of task3 | 2 |
| Class FA2021\_CSGradingStudentsApplication |  |
| Create 5 arrays – read information – Read information to fill out the arrays | 2 |
| Menu - handle to allow users to continue selecting tasks until they choose exit | 2 |
| **TASK1**: read information from keyboard, create object, access method in data type class,  write to file | 8 |
| **TASK2:** read id, open file, compare id, read, and split information, create object, access method of data type class to display the output | 6 |
| **TASK3:** Open file to read, close file, read file, split information, create the object, access method of data type class to display the grades of all students in requested format | 6 |
| Project Scores | 80 |