

ASSIGNMENT 1 FRONT SHEET

Qualification	BTEC Level 5 HND Diploma in Computing		
Unit number and title	Unit 0: Procedural Programming		
Submission date	04/09/2020	Date Received 1st submission	
Re-submission Date	12/09/2020	Date Received 2nd submission	
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Class	GCC0802	Assessor name	Nguyen Hung Dung
Student declaration <p>I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.</p>			
		Student's signature	CaoNguyen

Grading grid

P1	P2	P3	M1	M2	D1

<div style="display: flex; justify-content: space-between; margin-bottom: 10px;"> <input type="checkbox"/> Summative Feedback: <input type="checkbox"/> Resubmission Feedback: </div>		
Grade:	Assessor Signature:	Date:
Lecturer Signature:		

Unit Number and Title	Unit 0: Procedural Programming
Academic Year	2019
Unit Tutor	
Assignment Title	Assignment 1: Analysis and Design a solution for procedural programming problem
Issue Date	
Submission Date	
IV Name & Date	

Learning Outcomes and Assessment Criteria		
Pass	Merit	Distinction
LO1 Understand the principles of procedural programming LO2 Be able to design procedural programming solutions		
P1 Provide an introduction to procedural programming	M1 Discuss on characteristics and features of procedural programming	D1 Critically evaluate the design of your solution against the characteristics and features of procedural programming.
P2 Identify the program units and data and file structures required to implement a given design	M2 Review the design of a procedural programming solution.	
P3. Design a procedural programming solution for a given problem		

Assignment Brief

Scenario:

A math teacher wants to manage grades of a class. He asks you to help him to write a small application to do that. He needs to enter student IDs, student's grades and store these information into 2 separate arrays (integer array for IDs and float array for grades). Then he needs to print all student IDs together with their grades. Finally, he needs to know which student has highest grade and lowest grade. Your program should be menu based with the options above. When an option is done, the program should go back to the main menu so he can choose another option. There should be an option to quit program.

Task 1

To prove your programming ability to be appointed to this small project, please prepare an illustrated guide on programming in general and a particular emphasis on procedural programming. Here you will need to include introduction to computer programming languages and discuss key features of procedural programming.

Task 2

Your next task is to do the analysis for the scenario mentioned above by doing the following subtasks

- Identify the variables and data types required in the program.
- Identify and describe 2 different selection structures, including the condition(s) to check; state why they are needed and where they can be used in the context of the scenario.
- Identify and describe any iteration constructs.
- Split the program into functions (sub-functions) and draw a hierarchy diagram to illustrate the structure of your program.

Task 3

You need to use a drawing tool to draw design diagram for your program, includes:

- A use case diagram for actions required

- Flow chart diagrams for: menu operation, printing IDs and grades, finding max grade and finding min grade.
- Review / evaluate your design, state clearly pros vs cons and which needs to improve, using characteristics of procedural programming as bases to discuss.

Write a report for 3 tasks above and submit the report to CMS in PDF format.

Submission Format

The submission is in the form of an individual written report. This should be written in a concise, formal business style using single spacing and font size 12. You are required to make use of headings, paragraphs and subsections as appropriate, and all work must be supported with research and referenced using the Harvard referencing system. Please also provide a bibliography using the Harvard referencing system.

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P1: Provide an introduction to procedural programming.

- The programming language is a special category of computer language, it is a computer language subset, designed for transmitting instructions to processor (CPU) devices, such as computers or smartphones. The programming language is used for computer programming; Create machine control systems or describe algorithms so it can be interpreted and interpreted understanding both man and machine.

- Key programming features:

- + Include samples of code, including if, for, int, char, string, double, float, when do-while,...
- + Predefined functions are methods which are already specified or included in the software library they're using it.
- + Modularity: Massive software systems are inherently complex and difficult to construct, modularity breaks down the broad structure into individual physical entities that make it easier to use comprehend.
- + Procedures: Procedures are tiny programs that help a programmer avoid duplication. A procedure is a section of software that performs a given task.
- + Local variables: A local variable is a variable declared in the variable you create. You should do it just use the variable that you used during the program.

- + Global variables: global variables are known to be variables declared outside the chain. Global variables have software breadth, and, unlike local variables, variables declared can be reached anywhere in the network.

- + Parameter passing: The type of value that can be inserted through a parameter functionality. Variables are the parts listed in a declaration of methods. The parameter needs to have a specific name and a specified data type.

- + Programming libraries: the programming libraries are various. We do have a couple of different functions and subroutines for a particular program.

- Introduction:

- + Procedural programming is a term used to denote the way in which a computer programmer writes a program. This method of software creation, often called a script, focuses on keeping coding as succinct as possible.

- + It's all focused on reaching a very particular end goal. Procedural programming produces a step-by-step program that guides the application through an instruction series. They execute each instruction in sequence. Procedural programming is about processes.

- + Data and functions are stored in a separate memory location in procedural programming, while the data and functions are stored in the same memory location in OOP. Programs consist of modules that are parts of a program that can be individually coded and tested and then assembled to form a complete program. These modules are procedures in process languages, where a procedure is a sequence of statements.

+ For example, in C, procedures are a series of imperative statements, such as assignments, evaluations, loops, and subprocedure invocations. These are functions that map arguments to return statements. Top-Down Architecture is the modeling approach used in procedural programming. This is where you begin with a problem (procedure) and then systematically break down the problem into subproblems. This is called functional decomposition, which occurs before a subproblem is sufficiently straightforward to be solved by the accompanying subprocedure.

+ If changes to the main protocol (top) are made, those changes will ripple into main sub-procedures, and sub-sub-procedures, and so on,...

P2: Identify the program units and data and file

structures required to implement a given design.

Identify and describe 2 different selection structures:

- "if" structure is single selection structure, it selects or ignores a single action. An expression requires arithmetic, relational or logical operators; when the condition is valid, the expression is evaluated in the statement.

- The "if" statement, allows us to establish decision-making in the programs. Programs may require certain logical tests to be carried out at some particular points. The tests and subsequent decisions are made by evaluating a given expression as either True (non zero) or False (zero). An expression involves

arithmetic, relational, and/or logical operators. Depending on the result of the expression the statements are executed.

- Depending on the result of the expression the statements are executed. The if a declaration has three basic forms: Simple if-else, nested if, if-else if ladder I used ‘if’ statement to find max and min.

- “Switch”: This is a multiple selection structure; Every mixture of character constants (single character in quotes) and integer constants (integer value) can only be used for calculation of a fixed integral state. The consequence of the expression of the switch statement is compared with each case label; if a relation with the label is correct, the following statement is executed; if the comparison is false, the next case is evaluated and so on; if no match occurs, the default statement (optional) is executed; You can finish each case structure with a “break” statement that means only one sentence sequence is implemented. I used “switch” to made a main menu.

Identify and describe any iteration constructs:

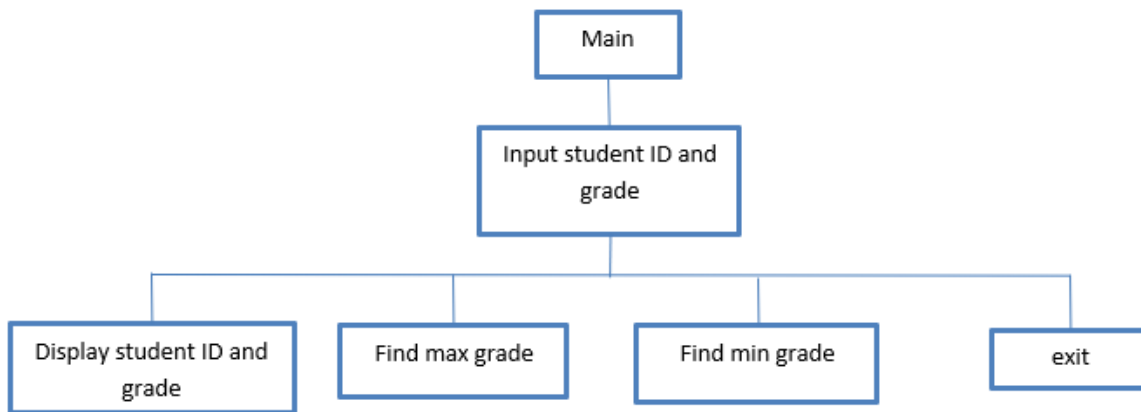
- “Do - while”: The do...while statement creates a loop that executes a specified statement until the test condition evaluates to false. The condition is determined after the statement has been executed, resulting in at least one implementation of the stated sentence. Declaration. A assertion that is executed at least once, and is re-executed if the condition is valid. To execute multiple statements within the loop, use a block statement ({ ... }) to group those statements. An expression evaluated after each pass through the loop. If condition evaluates to true, re-execute the argument. When condition evaluates to false, control passes to the statement following the do...while. Since the expression is tested at the end of the loop, the body of the loop is executed at least once. I used “do-while” to made a loop statement for main menu.

-Expression can be a constant value, variable or any expression. If the expression evaluates to True, the body of the loop is executed, otherwise statements after the while block is executed. After executing the body of the loop, the expression is checked again. The body of the loop is executed repeatedly until the expression is False. If the expression is initially False, the body of loop is not executed at all. (Programming, 2007)

The variables and data types:

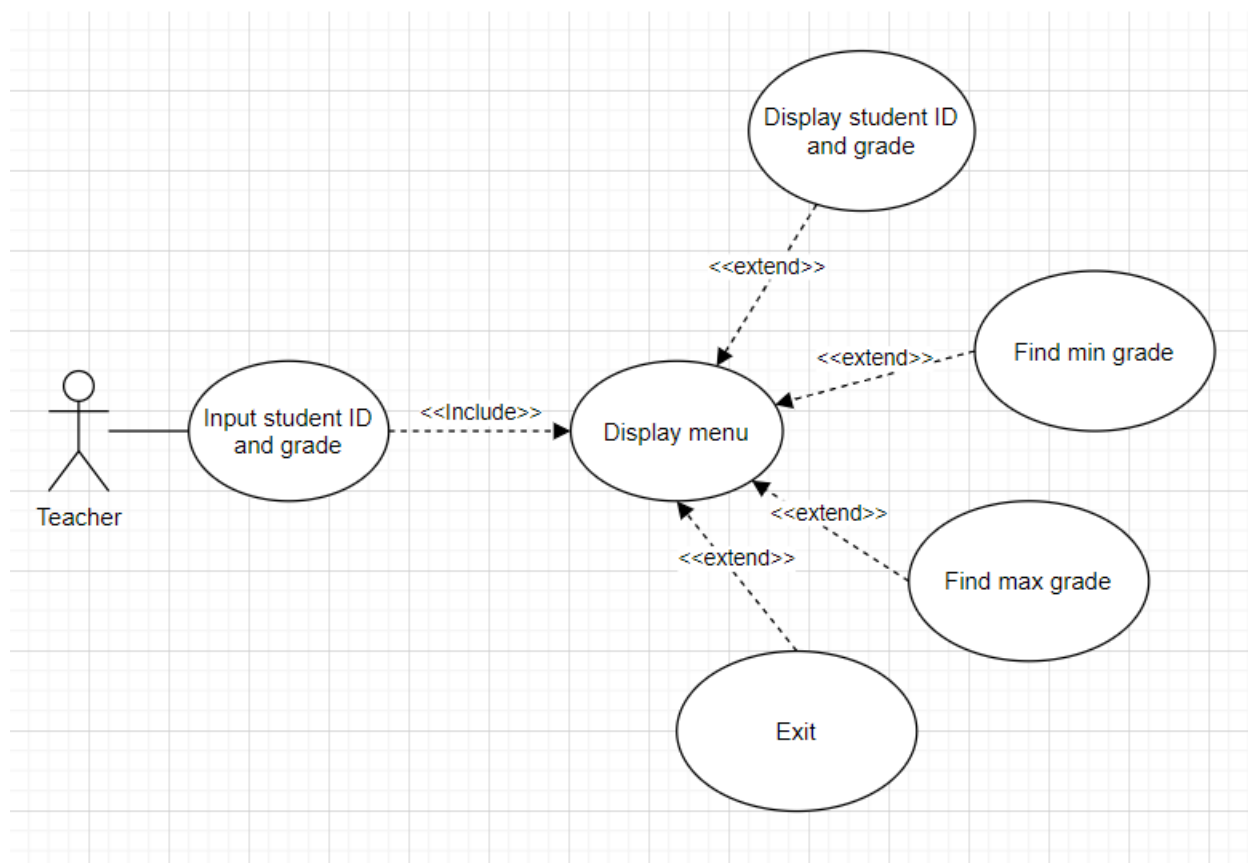
No	Variable	Data types	Describe
1	ID[]	Int	Store student ID
2	Grade[]	Float	Store student Grade
3	Max	Float	Store the maximum grade
4	Min	Float	Store the minimum grade
5	Another variable: I, n,..	Int	

Hierarchy diagram :

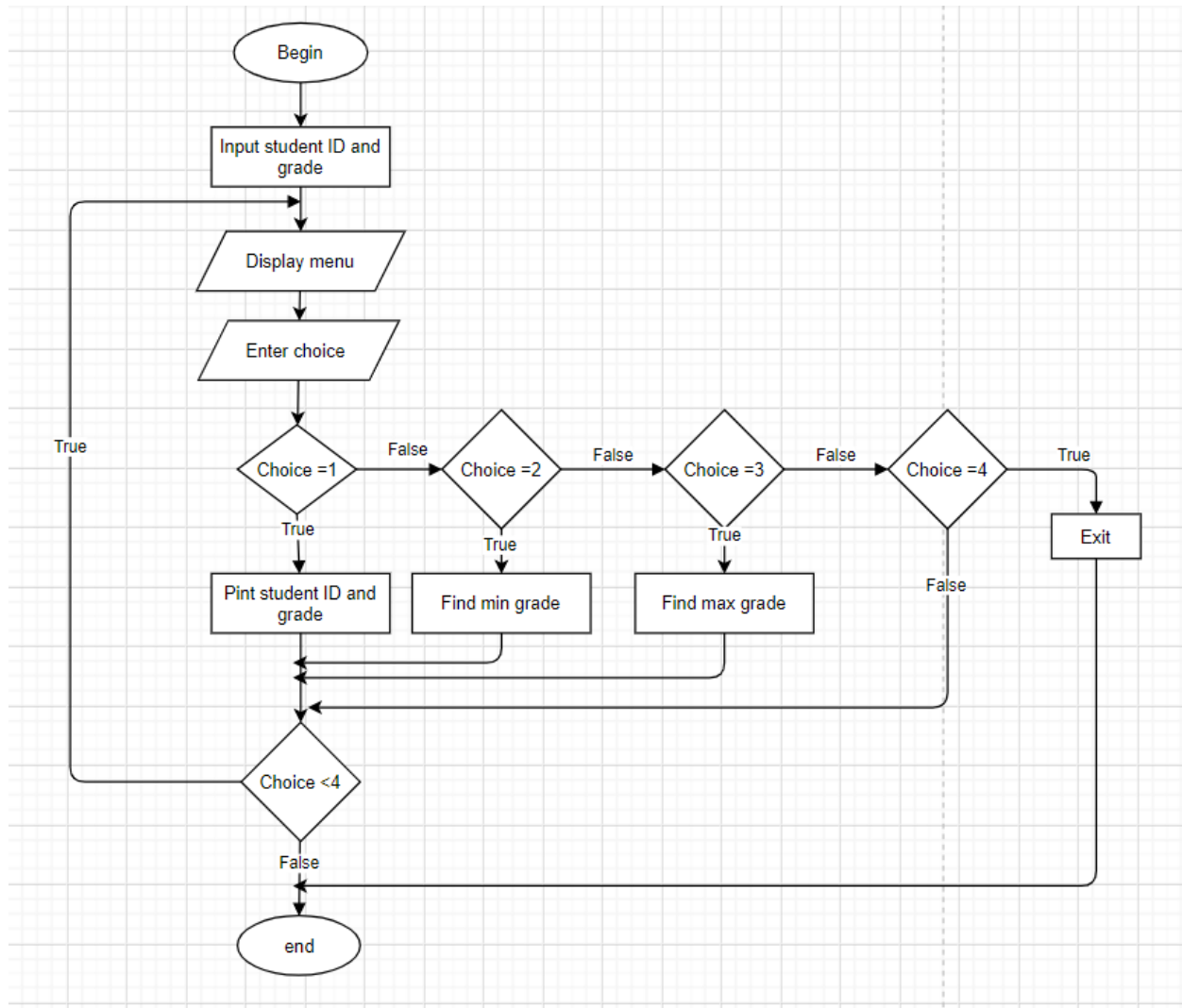


P3: Design a procedural programming solution for a given problem

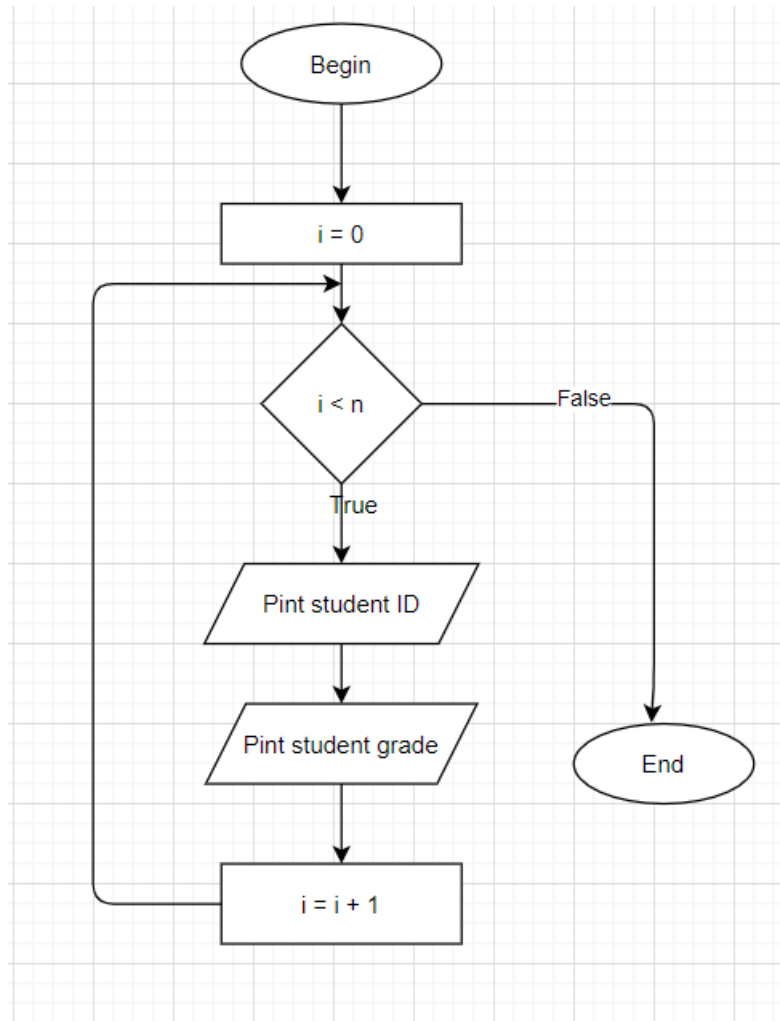
Using Diagram of Case:



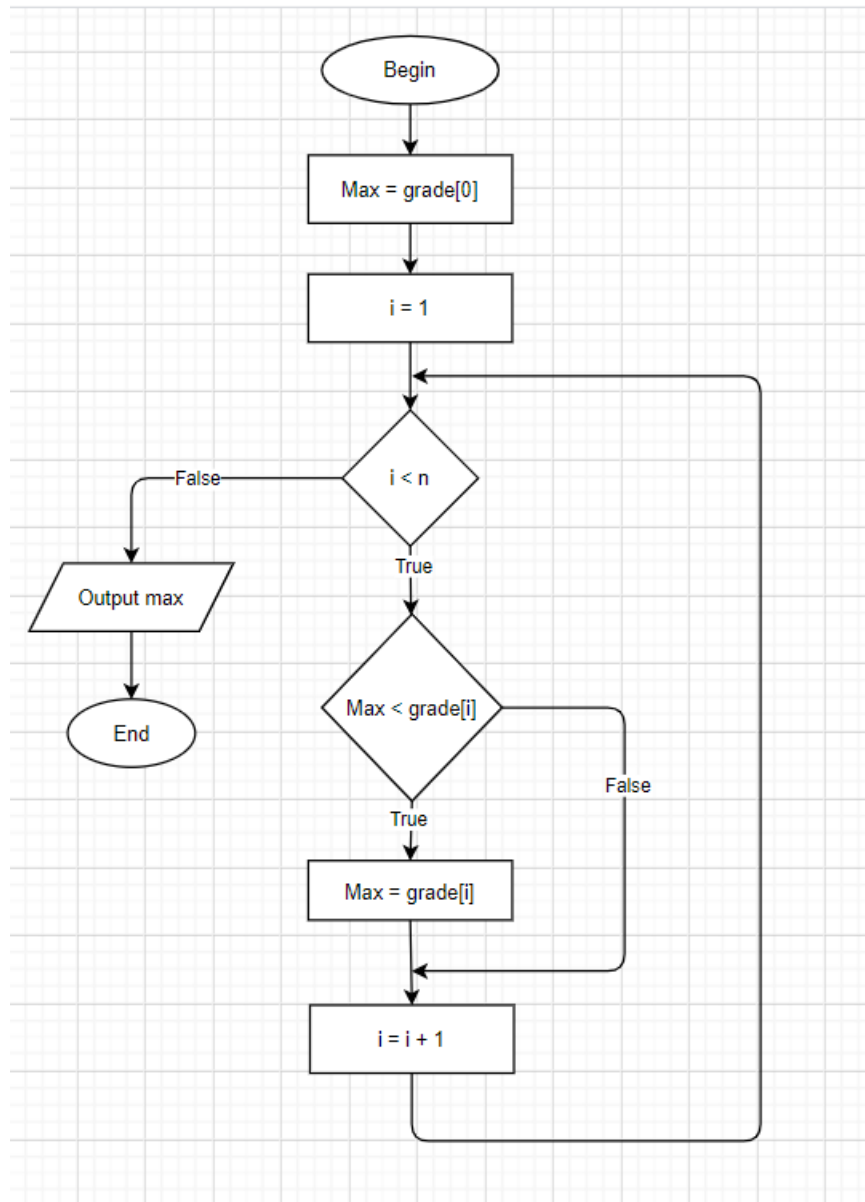
Menu operation:



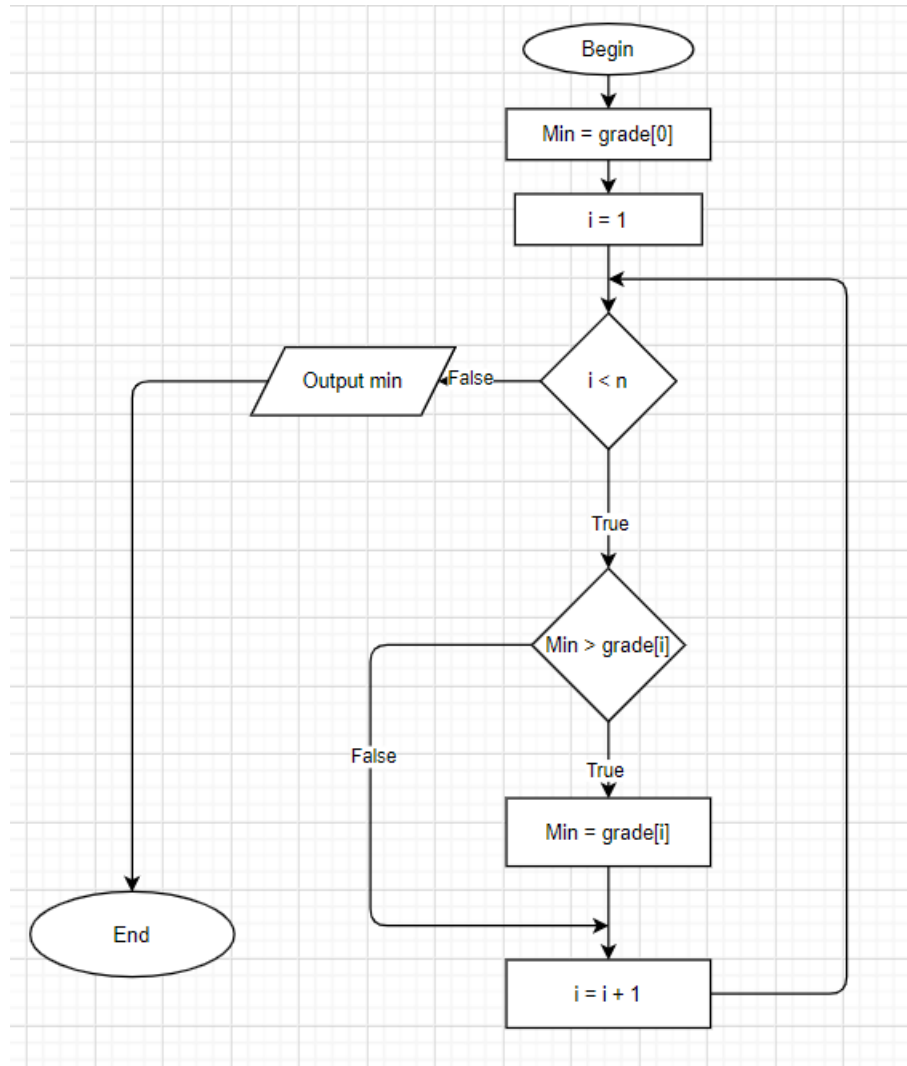
Printing IDs and grades:



Finding max grade:



Finding min grade:



References

Programming, P. S. a. C., 2007. *©Copyright 2007, Cognizant Technology Solutions, All Rights Reserved.*
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