ICT SBA title for HKDSE 2025

Multiple Choice Marking and Analysing System (MCMAS)

The MCMAS is an analysis tool used by teachers to mark multiple choice answer sheets and generate statistical information.

Some examples of statistical functions of system are shown below:

- Passing percentage of all students
- Average, maximum, minimum and standard deviation of the marks.
- percentage of response in each option in each question
- percentage of correctness in each question
- list of questions with low correct percentage (less than 50%).

Task 1 (Design & Implementation) (25 marks)

Part 1 (This part can be included in your main document to show how to break down the problem.)

- Create and define the following components of the problem-solving procedures of the above program.

(a) Select data types for two of the statistical functions mentioned above.

(b) By using stepwise refinement, describe your system.

(c) Use a flowchart to show algorithm of finding the percentage of correct responses for each student.

```
(1.structure of data file(s)and data types of global varaibes
 2. Main menu
 3. Flowchart of algorithm
   of finding the percentage of correct responses for each student)
```

Part 2

- Write a program to implement the **MCMAS** with not more than four statistical functions with a plain text format for input, an analysis report with mark list for output and samples of answers for program testing. You may consider some of the following key factors when designing the program:

Format of the data in the data file	program output
data structure	interface of the program
variable declaration and initialization	modularity
data collection, input and validation	error handling
data processing	reusability and portability

Part 3

- Create a presentation and/or documents to briefly describe the components involved in designing the program.

  In your document, you should include the following:

  - Flowcharts in part 1
  - global variables list
  - subprogram list with description
  - screen captures of sample runs
  - complete program list

Task 2 (Testing & Evaluation) (15 marks)

Referring to the program, complete the following tasks.

Conduct a test of the program. Collect and record the feedback and results of the test.

Either (i) make one major change in the program and illustrate the corresponding improvement,

or (ii) describe how the scope of the program could be extended.

Create a presentation and/or documents to illustrate the development of the program. You may want to consider some of the following:

- pros and cons of the program design
- test data and test cases
- unit test
- system test
- user acceptance test
- debugging
- algorithm optimisation