

Objective

In order to gauge programming ability, all students wishing to progress onto the A Level GCE in Computer Science in September are mandated to undertake a small programming project in the Summer. All students wishing to take the A Level in Computer Science are expected to achieve at least a Grade 7 at GCSE.

This will both support the A Level coursework in September 2021 and more importantly provide the Head of Computer Science an accurate insight into student capability and suitability.

It is anticipated that the project will benefit prospective students in the following ways.

1. GCSE Computer Science Skills to demonstrate from prior knowledge
 - 1.1. Requirements Analysis skills
 - 1.2. Design skills – problem decomposition, flowcharts/pseudo-code
 - 1.3. Coding skills
 - 1.4. Testing skills – Unit, System and User
2. GCE Computer Science Skills to practice
 - 2.1. Research skills
 - 2.2. Conceptual Thinking skills
 - 2.3. Analytical and Critical Thinking skills
 - 2.4. User Features
 - 2.5. User Interface Requirements and Design skills
 - 2.6. Project Planning skills
 - 2.7. Stakeholder Analysis skills
 - 2.8. All of 1.1 to 1.4

Technical Guidelines

Effort

Students are expected to commit at least 30 hours to complete the project. All Code will be inspected for originality and an A level grade will be awarded in accordance with the level of aptitude and technical ability demonstrated.

Language Choice

Students may choose any modern programming language such as Python, C#, Java, JavaScript – but make sure to justify your choice.

Project Brief

Students must research, analyze, design, code and test how to provide a solution to the following problem.

Document all assumptions and assertions.

Design a solution that provides a means to validate a 16 digit Credit Card number from Visa or Mastercard only. The solution must validate a Credit Card number that has been entered by the user through a simple Graphical User Interface and provide specific responses as to what is wrong with the Credit Card number.

The Luhn's algorithm should be used.

Extension

Provide a feature to validate a set of Credit Card numbers that are held in a Comma Separated Value (CSV) file.