**Pearson Edexcel Level 1/Level 2 GCSE (9–1)**

# Computer Science
**Paper 3: Computer Science project**

**The following is provided:**
SampleData2017.txt file
TestPlan_Template.rtf file

## Instructions to teachers

- Students should use one of the following programming languages:
  - (1CP1/3A) Python
  - (1CP1/3B) Java
  - (1CP1/3C) Pascal/Object Pascal
  - (1CP1/3D) Visual Basic.NET
  - (1CP1/3E) C-derived languages.
- You must adhere to the instructions for the conduct of NEA.
- Internet access is not allowed.
- The materials submitted for assessment must include:
  - evidence of the development of the solution
  - the program code
  - a completed Controlled Assessment Record and Authentication Sheet –
    available on the Pearson website.

## Information for students

- The total mark for this component is 60.
- The work you submit must be your own.

*Turn over* ▶

W57717A

P e a r s o n

**Customer Loyalty Scheme**

The managers of Crawdale Hotel Group have decided to update their customer loyalty scheme. Customers joining the scheme become silver members. Customers are upgraded to gold members when they have booked 30 nights' accommodation and to platinum once they reach 100 nights.

Silver members receive 2500 loyalty points per night booked, gold members receive 3000 points and platinum members 4000 points. The data is stored as a text file.

The data in this table is provided in the SampleData2017.txt file.

| Member ID | Surname | Year joined | Membership status | Nights booked | Points balance |
|-----------|---------|-------------|-------------------|---------------|----------------|
| Gri33415 | Griffiths | 2015 | Gold | 35 | 40000 |
| Smi22316 | Smith | 2016 | Silver | 3 | 7500 |
| Mia56213 | Miah | 2013 | Platinum | 140 | 165000 |
| All78915 | Allen | 2015 | Platinum | 120 | 145000 |
| Hug91714 | Huggett | 2014 | Platinum | 150 | 50000 |
| Sel77617 | Selby | 2017 | Gold | 40 | 45000 |
| San55614 | Santus | 2014 | Silver | 12 | 30000 |
| Lee44213 | Leewah | 2013 | Silver | 15 | 37500 |

The loyalty points can be redeemed for nights at the hotels. A night costs 25000 points.

**Requirements**

The managers want a computer program to help them operate the scheme efficiently. The program must allow hotel staff to add new members to the scheme, record nights booked and points redeemed. It must also update a member's points balance each time they book nights or redeem points, upgrade their membership status when appropriate and allow the number and status of the members to be monitored.

The number of nights in a single booking must be limited to a maximum of 14.

The program must allocate a unique ID to each new member consisting of the first three letters of their surname, plus a three-digit number, followed by the last two digits of the current year.

Your task is to analyse these requirements and to design, implement, test and evaluate a solution. You will need to make some assumptions and decisions of your own.

**The Report**

Create a folder called Report. Save all your evidence for assessment in this folder. Save your evidence as instructed at each stage.

**Stage 1 Analysis (6 marks)**

You should include an introduction summarising the overall problem.

The problem should be broken down into sub-problems. You should write a description of each of the sub-problems you identify and explain your selection of sub-problems. State any assumptions you have made.

Save your work in the Report folder as a file called Analysis.

**Stage 2 Design (18 marks)**

**Algorithms (12 marks)**

Design algorithms, using pseudo-code or flowcharts, which show a logical solution to each sub-problem. You should include inputs, processes, outputs, validation checks and the programming constructs that you will use when you produce your program.

You should show how the algorithms will link together and lead to an overall solution.

Save your algorithms in the Report folder as a file called Design.

**Initial test plan (6 marks)**

You should complete the relevant sections of the test plan template provided to produce an initial test plan that will demonstrate your strategy for testing your solution.

Save your initial test plan in the Report folder as a file called TestPlan.

Save a copy of TestPlan in the Report folder as a file called TestTable, to be used in stages 3 and 4.

**Stage 3 Implementation (24 marks)**

You should translate your design into a program. Ensure that your program is clear and easy to understand.

Add the results of any tests carried out during the implementation stage to the TestTable file.

Save the updated TestTable file.

You should provide evidence showing how you debugged your program. Save your evidence in the Report folder as a file called Debugging.

Create a subfolder called Implementation in the Report folder. Save your source code and all the files required to execute the program in the subfolder.

**Stage 4 Testing, Refining and Evaluation (12 marks)**

You should complete the TestTable file by adding any further tests carried out at this stage, including the results of re-testing following the correction of any errors.

Save the completed TestTable file.

Evaluate your solution by explaining how well your program meets each of the requirements that you identified in your analysis and describing any refinements that you made to your program during design and implementation.

Save your evaluation in the Report folder as a file called Evaluation.