PROGRAMMING CHALLENGE 14: SOFTWARE LICENCE

When buying software, the purchaser is issued with a licence key. The product licence can be purchased for either one or three computers. A file is maintained of all the licence keys currently active and whether the licence was for a single-user or 3-users.

The licence key is a 10 character code as follows:

CCCCCCCCCD

- C = a randomly generated upper-case letter.
- D = a check digit character calculated from the preceding nine letters.

A new licence key is generated for each purchase.

An example key is produced as follows:

- randomly generated letters: FGKWRDFTA
- a set of products is calculated as shown:

Randomly generated letter	ASCII code	Multiplier	Product
F	70	1	70
G	71	2	142
K	75	3	225
W	87	4	348
R	82	5	410
D	68	6	408
F	70	7	490
T	84	8	672
A	65	9	585

- Then the total of the products is calculated:

Total	3350

- The total 3350 is then divided by 11 to give remainder 6 which becomes the check digit character.
- This gives the complete licence key: FGKWRDFTA6
- If the calculation gives remainder 10, the check digit character used is X.

Task 1

Design a function `LicenceKey` to generate a new licence key.

Write program code to implement the function.
Test the function for **three** new licence keys.

Evidence 1

- Program code for the `LicenceKey` function.
- Screenshot(s) showing the generation of the three new licence keys. **[10]**

Task 2

A file `LICENCE-KEYS.TXT` is maintained storing all licence keys which are currently active. This test file has 20 licence records. You will need this file for the programming which follows.

Typical data for two licences are shown:

`SYNCTKMMF8 1`
indicates this is a single-user licence.

`SNPHHUATV7 3 1`
purchased as a 3-user licence, but currently has only one registered user.

Write program code for a menu with the following options:

1. Purchase of a new licence for either a single-user or 3-user licence
2. Register an additional user to an active 3-user licence
3. End

Task 3

Write code as a procedure for menu option 1.

The requirement will be

- Input from the user the type of licence.
- Generate the new licence key.
- Display licence key issued.
- Save the data as a new record in the `LICENCE-KEYS.TXT` file.
- Display final contents of `LICENCE-KEYS.TXT` file.

Evidence 2

- Program code for menu option 1.
- Screenshot(s), showing evidence for the issue of the two types of licence, displaying:
  - the licence key issued
  - the final contents of `LICENCE-KEYS.TXT` file. **[6]**

Task 4

Program menu option 2.
Carry out **three** relevant tests.

Evidence 3

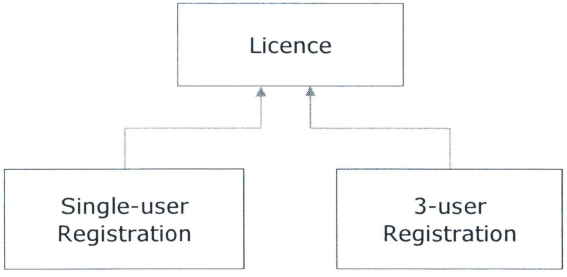
- Program code for menu option 2.
- Screenshot evidence of three test cases. **[5]**

When a licence is purchased, the licence key, licence type (single-user or 3-user), purchase date and name of the purchaser are recorded.

A registration process then follows for each computer.

- The computer to which a licence is registered has its MAC address and the date of registration recorded.

The program design to manage purchases and registrations is to be implemented with object-oriented programming with the following three classes:



Task 5
Write program code only for the three classes shown.
Do not attempt to develop the application further.

Evidence 4
- Program code for the three classes. **[9]**