School Systems Update

Current Situation

Parkwood Vale is a small primary school that serves the local community. Parkwood Vale would like to begin storing data on a computerised system. Whilst the school could buy an off-the-shelf package, it had decided to commission a bespoke solution but the developer has changed role and they are left with an incomplete program.

You have been asked to finish the project. A partial design for the interface has been provided in the files you have been given access to in a GitHub repository, https://github.com/jerseyitguy/SchoolUpdate

- Run a virtual environment in Python 3.8
- Test the progress the developer made

Test

Test the previous developer has correctly completed the following:

Add Teacher

The school has decided that it would like to store the following staff details:

- TeacherID

- Firstname
- Surname
- Address
- Postcode
- Qualification (such as BSc (Hons) Physics).

The form should also include buttons that:

- save the details to a file on disk called TeacherDetails.txt
- return to the main menu.

The school has provided a partial design of the user interface they would like to use.

Payroll

Payroll Parkwood Vale would like to calculate the correct amount of pay for individual teachers. Users will enter the monthly salary (Gross Pay) and the system will calculate and display deductions (Tax, National Insurance and Pension Contribution), and the correct amount of take-home pay (Net Pay). The following calculations should be used for the prototype software:

- Tax = 20% (0.2) of Gross Pay
- National Insurance = 14% (0.14) of Gross Pay
- Pension Contribution = 8% (0.08) of Gross Pay
- Deductions = Tax + National Insurance + Pension Contribution
- Net Pay = Gross Pay – Deductions.

They have decided that currently there is no need to store the results of these calculations. A partial design for the user interface has been provided.

New Requirements

Student Loans

Park Wood School requires an additional feature that will calculate the student loan repayment amounts which need to be deducted from staff salaries. You may assume that student loan repayments are 10% of gross pay. Design an algorithm which:

- allows the user to input the employee’s gross pay;
- calculates the student loan repayment;
- calculates the net pay by deducting the student loan from the gross pay;
- outputs the result of the calculations.

Pupil information

Park Wood School would like to create a new form to store pupil details.

1. Create a new form.
2. Insert a title on the form “Add Pupil”.
3. Create a text box and provide appropriate labels to allow a user to input each of the following:
    a. Pupil ID
    b. First name
    c. Surname
    d. Form class
    e. Date of birth
4. Create a functioning “Back” button that returns the user to the main menu.
5. Add code to implement a presence check on Pupil ID.
6. Create a “Save” button and add code to the Python file to enable the saving of the above details in a file called “pupilDetails.txt” displaying a confirmation message.
7. Implement the validation check that you designed in question 4 to check that a pupils first name does not contain a numeric character.
8. Explain how all the new functionality works by annotating the code you have added within your Python file.

Enter your code in a new Python file called Pupils.py.

Testing

Park Wood School requires you to carry out the following tests on the program.

1. Test the functionality of the presence check on the Pupil ID field
2. The following pupil details are to be stored using your Python program:
    a. Pupil ID: 1101
    b. First name: Kwai
    c. Surname: Oer
    d. Form class: 4B
    e. Date of birth: 6/1/2015
3. Create a message confirming that the pupil details have been stored

Refinement

Park Wood School has asked you to carry out the following code refinements to change the function and improve the efficiency of their code.

Park Wood School is aware of changes to the tax system that they will have to implement. Refine the code within ParkWoodSchool.py to take account of the following changes.

1. Increase the Tax Rate from 20% to 22%.
   Describe the refinements you have made to your code for the increase in Tax Rate by annotating your code.
2. Change the National Insurance Rate to 8.5%
   Describe the refinements you have made to your code for the change in National Insurance Rate by annotating your code.

Enter your code in Payroll.py.

The code within the ParkWoodSchool.py program makes use of many nested if statements which are used to display an error.

1. Refine this code to make it more efficient.
2. Describe the refinements you made by annotating the code.

Enter your code in ParkWoodSchool.py.

Refinement testing

Test the Payroll form when a gross pay of £1,850.00 is input.