Assignment 1 Pseudo Code

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Exercise 1:
Write a pseudocode for your program.

Program Start

Initialize integer variables for, employee id and year of birth.
Initialize string variables for gender, residential status, first name, surname.
Initialize constants for employee id limit, lowest year, and current year to calculate age.
Initialize double chargeable income.
Initialize char quit to close while loop.

While input is not 'Q' or input is not 'q',

Display welcome message.

Ask user to enter first name and then store first name.

Ask user to enter surname and then store surname.

Ask user to enter gender and then store gender.
While gender is not "M", "m", "F", "f", "O" or "o",
Clear the input.
Display error message.
Ask user to reenter gender.
Based on gender, reassign gender to "Mr.", "Ms." or "one".

Ask user to enter their year of birth and store year of birth.
While age is not a number or behind lowest year or ahead of current year,
Clear input.
Display error message.
Ask user to reenter year of birth.

Ask user to enter their employee id and store employee id.
While employee id is out of range or not a number,
Clear input.
Display error message.
Ask user to reenter employee id.

Ask user to enter residential status and store residential status.
While residential status is not "Y", "y", "N" or "n",
Clear input
Display error message.

Ask user to reenter residential status.
Based on residential status, reassign residential status to “a resident.” or “not a resident”.

Ask user for chargeable income and store chargeable income.
While chargeable income is not a number or out of range,
Clear input.
Display error message.
Ask user to reenter chargeable income.

Declare constant tax brackets minimums, tax bracket maximums tax percentages, residential sum amounts, non-residential sum amounts.
Calculate taxes based on residential status income:
If residential status = “not a resident”,

non-residential taxes = (chargeable income – tax bracket max) * tax percentages + non-residential sum amounts

If residential status = “a resident”,

residential taxes = (chargeable income – tax bracket max) * tax percentages + residential sum amount

Initialize double total tax.

If residential status is “a resident” then:
Residential taxes = total taxes.

Else if non-residential status is “not a resident” then:
Non-residential taxes = total taxes.

Display the gender title (Mr./Ms./one) followed by user’s first name and surname.
Use substring to split and display user’s first initial only.
Display user’s employee id with set width to 3 and set fill to ‘0’.
Display current year – year of birth.
Display residential status title (a resident/not a resident).
Display chargeable income and total taxes.

Ask user to input ‘Q’ or ‘q’ to leave program or any other key to restart and store value.
If input is ‘Q’ or ‘q’,
Break.

Display program end message.
Program end.

Exercise 2:

1. Which variables do you need?

- Needed variables include first name, surname, year of birth, gender, chargeable income, employee id, residential status, lowest entry year, highest employee id, tax brackets, tax percentages, total taxes and quit prompt.

2. Which variables do you need for input?
   - For input, needed variables are first name, surname, year of birth, gender, chargeable income, employee id, residential status and quit prompt.

3. Which types do you use for which variable. Explain why?
   - Year of birth, employee id, current year, lowest entry year, highest employee id and tax brackets will be of the integer type. These variables use numbers as input with no decimals.

   - Total tax, total chargeable income, tax percentages, residential tax, and non-residential tax will be of the double type. These variables deal with calculations that require decimals places to give precise results.

   - Gender, residential status, first name and surname use the string type. These variables have multiple alphabets/symbols and a combination of numbers. Gender and residential also deals with reassigning these variables with new input. The substr() function is also used by the first name to return the first initial only.

   - The char type is used for the while loops prompt. Once the char is entered, the loop will either end or restart. Quit is the only char used in this program.

This variable has a single alphabet prompt to exit loop as such char is used.

4. What type of loop is best to validate the input? What is the loop condition?
   - The best type of loop to validate the input are while loops as they are event based as opposed to for loops which are count based. In this program, we can use while loops to repeated ask the user to reenter inputs until the condition is satisfied and moves on to the next section to seek validation. The loop condition is this program is the “while(quit != ‘Q || quit != ‘q’)”. When the prompt is validated, the loop ends and program end message is shown.

Exercise 3:
Case Test 1:
First name: Rohan
Surname: Nandan
Gender: f
Year of birth: 2003
Employee ID: 23
Residential status: Y
Chargeable income: 60000

Expected Outcome 1:
Hello Ms. R. Nandan (Employee ID:023)
You are 21 years old and a resident of Fiji. Based on your provided income of $60000.00, you are requested to pay an income tax of $5600.00
Do you wish to leave this program? (Enter Q to leave or any other key to restart program)

Case Test 2:
First name: Indee
Surname: Nair
Gender: M
Year of birth: 1975
Employee ID: 009
Residential status: n
Chargeable income: 85000

Expected Outcome 2:
Hello Mr. I. Nair (Employee ID:009)
You are 49 years old and not a resident of Fiji. Based on your provided income of $85000.00, you are requested to pay an income tax of $17000.00
Do you wish to leave this program? (Enter Q to leave or any other key to restart program)

Case Test 3:
First name: Zhixian
Surname: Chen
Gender: o
Year of birth: 1955
Employee ID: 1
Residential status: N
Chargeable income: 230000

Expected Outcome 3:
Hello one. Z. Chen (Employee ID:001)
You are 69 years old and not a resident of Fiji. Based on your provided income of $230000.00, you are requested to pay an income tax of $46000.00
Do you wish to leave this program? (Enter Q to leave or any other key to restart program)

Exercise 4:
The program for this assignment is honest, in that it reports honestly what the user provides as input. Of course, rather than reporting what the user enters, your program could make a biased report - a preferred option – more income or less tax if it wants to.

Would this be ethical to do? Would this be in line with the ACS Code of Ethics and with basic Programming Ethics Explain. Please answer in less than 300 words.

Making a biased report that provides false information in relation to what the user provides as input would be extremely unethical. It would violate the ACS Code of Ethics.

Providing fraudulent report would violate the principles of the ACS Code of Ethics as well as ethics of basic programming. The objective of a program is giving honest, unbiased output depending on the user's input without inflating or deflating values, in doing so it breaks 3 fundamental principles of the ACS Code of Ethics, which are to "act with honesty, integrity and fairness, and in the best interests of the client". In doing this, it creates a veil on the transparency developers have with the user and the mishandling of their data.

Furthermore, breaking these principles bring forward legal ramifications of unethical pratices and exploitation of the user's data. It puts the user's financial and legal assets in danger as well as creates disillusionment with developers and the damages their reputation.

To conclude, it is incredibly unethical to use one's program for nefarious purposes outside of its unbiased, calculation-based motive. This action severely breaks the ACS Code of ethics as well as the ethics of basic programming as such must be avoided and those partaking this be punished.

Exercise 5:
1. Please answer the following:
(a) Did you copy from other groups, other students, or public sources? No

(b) Did you let other students copy from you? No

2.
• Did you put your name and student number on the first page? YES
• Did you put your name and student numbers into the program? YES
• Will you upload a write-up for Sections 2 & 4? YES
• Did you upload the program for section 3? YES
• Did you submit before the deadline? YES