**CS111 Assignment 1 – Write Up**

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**Exercise 1: Organize & Manage**

**(a) Write a pseudocode for your program**

Start program

🡪Variables had been declared

🡪A do while loop was created to loop input and output as long as user

enters “C” (CONTINUE), if not program is ended.

🡪Requests for input from the user in the do while loop.

🡪Validation was done for the input statements.

🡪If else structure was done to calculate and determine the users gross

pay, annual salary and tax amount.

🡪End of do while loop.

End of Program

**Exercise 2: Find and Generate**

**1) Which variables do you need?**

* First name, Last name, ID, gender, year of birth, age, normal pay, overtime pay, double time pay, total pay, tax rate, tax amount, hours worked, annual salary, user input “i”
* Constants – pay rate, overtime rate, double time rate, current year, normal hours, weeks in year

**2) Which variables do you use for input?**

* fname, lname, id, gender, yob, i.

**3) Which types do you use for which variable. Explain why?**

* String – fname, lname, id, i // (since all of the variables require user to enter **text-based** input, the best type for these variables would be **strings**)
* Char – gender // (since the user may only enter a **single character**, the best type for the gender variable would be **char**)
* Double – normal pay, overtime pay, double time pay, total pay, tax rate, tax amount, hours worked, annual salary // (since these variables may contain values in **decimals** and they **require calculations** to be done on them the best type for them would be **double**)
* Integer – yob // (since the value of this variable will always be a **whole number** the best type for this would be **int**)
* Constant double – pay rate, overtime rate factor, double time rate factor // (since there values will **remain unchanged**, they are constants and their type is double because they are **decimals**.)
* Constant integer – YEAR // (the current year will be a constant integer because it is a **whole number** and it will **remain unchanged**)

**4) What type of loop is best to validate the input? What is the loop condition?**

* The best type of loop to validate an input would be a **while loop**, as it will repeat the program until the user enters the correct (required) input. The loop condition will be “**cin.fail()**” as this function will check to see if the correct data type has been entered i.e. validate the input. As long as the condition is true, meaning the wrong input is entered, the code will loop until the correct data type is entered.

**Exercise 3: Evaluate and Reflect**

* **Test case for a male who is born in the year 2000 and worked 60 hours a week**
* Input: gender = “m”, year of birth = 2000, hours worked = 60
* Expected output: age = 23, Gross Pay Week = $1550, Annual Salary = $80600, Tax Amount: $16130
* **Test case for female of the same age and same hours worked**
* Input: gender = “f”, year of birth = 2000, hours worked = 60
* Expected output: age = 23, Gross Pay Week = $1550, Annual Salary = $80600, Tax Amount: $16120
* **Test case for someone of over 80 years of age**
* Input: gender = “M”, year of birth = 1940, hours worked = 70
* Expected output: age = 83, Gross Pay Week = $1950, Annual Salary = $101400, Tax Amount: $0

**After testing, all of the above cases were satisfied and the correct results were produced.**

**Exercise 4: Communicate and Apply**

Yes, it is unethical and it is against the laws of integrity, honesty, and duty of care in the **Austrian Computer Society** to produce or provide a biased report that intentionally misinterprets user input. Programmers have a responsibility to conduct themselves in an ethical and honest manner while at work, and deliberately mis representing data is a violation of these principles.

**Exercise 5: Embark and Clarify**

1. **Please answer the following:**
2. **Did you copy from other groups, other students, or public sources?**

* NO

1. **Did you let other students copy from you?**

* NO

**2)**

* Did you put your name and student number on the first page? **YES**/NO
* Did you put your name and student numbers into the program? **YES**/NO
* Will you upload a write-up for Sections 2 & 4? **YES**/NO
* Did you upload the program for section 3? **YES**/NO
* Did you submit before the deadline? **YES**/NO