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|  | **CS 213: Object Oriented Programming**  **Lab Exercise 1 (Friday 20th January 2023)**  **[40 Points]** |

**Instructions**

You are advised to work in your teams of twos (“Pair Programming”) or three for this lab. Here, you and your partner(s) will take turns to answer questions. For every question, think through the question and then in turn you provide how you will answer the question. That said, submit individual work. Full participation is expected.

*Submission*: Submit your work (i.e., **this file**) to a slot on CANVAS by 11:55 pm today, Friday 20th January 2023.

**PART 2 – CHALLENGE [35 Points]**

1. [**5 points**] From Python programming, you would have **indirectly** worked with data types. In contrast, Java is strict on the declaration of data types for member variables and constants. You must have read of and used a few in class.
2. [**2.5 points**] Provide five (5) data types in Java.
   1. Int
   2. Byte
   3. Char
   4. Bool
   5. Double
3. [**2.5 points**] Declare and initialise a variable for each of the data types mentioned in (i) above.

int ageNumber = 2;

byte ageNumber2 = 23;

char myName = Favour;

bool javaTough = True;

double cameraSize = 38;

[**Hint**: Your variable names should be meaningful and camel-cased]

1. [**30 points**] For each python program given below,
2. [**10 points**: 5 points for each program] Briefly explain what it does.

**For program 1:** The program displays the instruction for the user to follow to achieve output. For each number the user enters, the number is checked under a while loop function block to see if it is an odd or even number, together with the number of zeros. The count is kept for each loop and the number of count is computed until the user enters a negative number for the loop to break. Finally, an output is displayed for the total number of even, odd, and zeros the user entered with a thank you message.

**For program 2:** The program asks the user for the number of classes they take per semester, the credit unit, and the letter grade. Using this information, the program computes for GPA and displays it together with the total credits and total points.

1. [**20 points**: 10 points for each program] By referring to Chapters 3 and 4 of the textbook, create a Java version of the two programs below:

**Program 1**

print("Enter a list of positive numbers, one per line.")

print("Use a negative number to indicate the end of input")

num = int(input())

even, odd, zeros = 0, 0, 0

while num >= 0:

if num == 0:

zeros += 1

elif num % 2 == 0:

even += 1

else:

odd += 1

num = int(input())

print("Thank you!")

print("You entered", even, "even numbers and",odd,  
"odd numbers and ",zeros,"zeros")

**Program 2**

n = int(input("How many classes did you take last semester? "))

total\_points = 0

total\_credits = 0

for i in range(1,n+1):

credits = float(input("How many credits was course #"+str(i)+"? "))

letter\_grade = input("What was your letter grade? ")

if letter\_grade == 'A':

points = 4.0

elif letter\_grade == 'B+':

points = 3.5

elif letter\_grade == 'B':

points = 3.0

elif letter\_grade == 'C+':

points = 2.5

elif letter\_grade == 'C':

points = 2.0

elif letter\_grade == 'D+':

points = 1.5

elif letter\_grade == 'D':

points = 1.0

else:

points = 0

total\_credits += credits

total\_points += points\*credits

gpa = total\_points / total\_credits

print("You took",total\_credits,"credits.")

print("Your semester GPA was",gpa)