STAT2005 Programming Languages for Statistics
Assignment 4
Due: 18 April 2025

1. For each of the following expressions, determine the order of operations and the results.

(a) `-(2+3/2)*4`

(b) `Exp(-3**2/4-7)*2`

(c) `-2**4 + 4/2*9`

(d) `10*2 >< 3**2`

(e) `2 + 3 = 6 | 3 & 0`

(f) `3 gt 2 = 1`

(g) `^(-3) + 3`

(h) `4 in (1, 2, 3, 4, 5) and 2`

(i) `4 > 3 >= 2`

(j) `not ('ab ' = 'a' || "b")`

2. Write SAS statement(s) for each of the following tasks:

(a) Set X1 to be the number of days in YEAR, a numeric variable for year, e.g. If YEAR = 2000, X1 = 366.

(b) X2 is a character variable for name. It contains two to three words, with the first word being the last name. Define NAME to be the name with the given name presented by the initials, e.g. if X2 = 'Chan Tai Man', then NAME = 'Chan T. M.' and if X2 = 'Chan Keung', then NAME = 'Chan K.'.

(c) Set X3 to be the larger root of $ax^2 + bx + c = 0$ if the polynomial has real roots, and set X3 to a missing value otherwise.

(d) Consider ΔABC with $\angle ACB = 52^o$. Denote the length of BC by a, the length of AC by b, and the length of AB by c. Find c given the values of a and b.

(e) X4 is a character variable of length 1. Replace the last non-blank character of Y by X4; set Y = X4 if Y = "".

3. Run the program here to create a temporary SAS data set called school

```
data school;
input Age Quiz $1. Midterm Final;
/* Add you statements here */
datalines;
12 A 92 95
12 B 88 88
13 C 78 75
13 A 92 93
```

```
12 F 55 62
13 B 88 82
run;
```

Using IF-THEN-ELSE statements, compute two new variables as follows: `Grade` (numeric), with a value of 6 if `Age` is 12 and a value of 8 if `Age` is 13. The quiz grades have numerical equivalents as follows:

A = 95, B = 85, C = 75, D = 70, and F = 65.

Using this information, compute a course grade (`Course`) as a weighted average of the `Quiz` (20%), `Midterm` (30%) and `Final` (50%).

4. Consider the data file `Blood.sas7bdat`.

(a) Create two temporary SAS data sets called `Subset_A` and `Subset_B`. Include in both of these data sets a variable called `Combined` equal to .001 times WBC plus RBC. `Subset_A` should consist of observations from `Blood` where `Gender` is equal to `Female` and `BloodType` is equal to AB. `Subset_B` should consist of all observations from `Blood` where `Gender` is equal to `Female`, `BloodType` is equal to AB, and `Combined` is greater than or equal to 14.

(b) Create two temporary SAS data sets by selecting all subjects with cholesterol levels (`Chol`) below 100. Place the male subjects in `Lowmale` and the female subjects in `Lowfemale`. Do this with a single DATA step.

You should submit a file `asg4.sas` via Blackboard, which contains all the SAS codes you use to finish this assignment. The codes should be commented as clearly as possible. Written work (if any) should also be attached.