Name and student number: _____

PSCB57. MIDTERM EXAM 21 OCT 2019 - PROBLEMS

Points in the square brackets give the idea of relative weight of problems. This part is worth **11% of the total course score**. *Please use left blank pages of the booklet as scratchpad, and write legibly a well commented Python program on the right, lined, pages. In the program header, please explain in words the scheme of your code, i.e., what your algorithm is doing step by step.*

For instance: "Program to find a maximum of (...). First reads the input from keyboard. Then it scans the values of unknown Z in (..) range, dividing search range into N equal intervals. Using a 'for' loop from 1 to N, program iteratively calls function (..) computing (..) and compares the returned value of variable (..) with the stored value in (..) to find a maximum of (..) etc.

You can describe the algorithm separately from the code if you wish, but the lines of code still must have brief comments on what they are supposed to do. Even if you get stuck somewhere, you may get a partial credit. We value the solution more for its clear and correct algorithm than for the Python syntax or style.

1 [7pts.] Problem 1 (example from preparation set)

Write an interactive program that asks for the weight in ounces and returns the corresponding number of grams. The program needs to detect the wrong negative input, and ask again. It should not print irrelevant distant decimals - round the result to reasonable accuracy before printing.

2 [13 pts.] Problem 2 (example from preparation set)

Input from keyboard a floating point value of V, prompted by a message that it is expected to be in units of m/s.

Create a table of angles α in degrees (from 1 to 90) and the corresponding distance (range) that a stone will land at, on an planet identical to Earth, except for the fact that it has no atmosphere. Stone is thrown at initial speed V, and the angle w.r.t. horizon given in the table. In the loop creating the table, detect and store the maximum range and the corresponding angle α, and print them with some explanation immediately under the table.

This part of the final exam is worth up to **11%** of the total course score. Statements are sometimes be tricky, so read carefully. A sigle word or number may be incorrect. **Any "[N]" answer circled MUST have at least one wrong word circled for credit.** Please disregard typos. Raise you hand if you find something worrying in the of the midterm, we will try to answer your question during exam. Programming questions refer to Python ver.3. To account for unintended ambiguity of questions 1 point per approximately 15 questions will be added to your result. Good luck!

[Y, N] One byte has 8 bits and can hold one of 256 different values

[Y, N] 1 million of float numbers occupies 16 MB of RAM (assuming M means 1e6, not 1024**2)

[Y, N] A clock frequency of 3 GHz corresponds to 1 clock cycle time (1/3) ns.

[Y, N] ENIAC was a binary arithmetic computer built in Oak Ridge by the U.S. government in 1940s. It was long considered the first modern computer, but is not considered that any longer by historians of science.

(...)

About 16 other statements to classify as Y or N here...

(...)

[Y] I have signed the frnt of this sheet with my name and student number.