Computer Science 3B

Practical Assignment 02

Assignment date: 2024-08-01

Deadline 2024-08-01 17h05

Marks: 70

This practical assignment must be uploaded to eve.uj.ac.za **before** 2024-08-01 17h05. Late[1] or incorrect submissions **will not be accepted**, and will therefore not be marked. You are **not allowed to collaborate** with any other student. Plagiarism is not tolerated. All submissions are tested for plagiarism.

Good coding practices include a proper coding convention and a good use of commenting. Marks will be deducted if these are not present.

The reminder page includes details for submission. Please ensure that **ALL** submissions follow the guidelines. The reminder page can be found on the last page of this practical.

BeatWatch is continuing with the next step to creating their system. Write an 80x86 assembly program that will calculate the *average heart rate* and *maximum heart rate*, given a set of **heart rates** (HR0, HR1, HR2, HR3, HR4).

BeatWatch want to avoid issues with decimal values and ask that you *round up* the average to the nearest whole number (e.g. 97.1 --> 98).

Your program must continually ask the user for the inputs (HR0, HR1, HR2, HR3, HR4) unless they choose to exit the program. You are only allowed to create global variables for inputs, average heart rate, and the maximum heart rate (as well as any string prompts). **Testing set** - Use these values to test your program:

HR0	HR1	HR2	HR3	HR4	Average	Rounded AVG	Maximum
144	86	172	124	121	129.4	130	172
111	102	166	118	125	124.4	125	166
62	111	94	63	155	97	97	155
150	137	165	82	160	138.8	139	165
76	157	157	106	149	129	129	157

[1] Alternate arrangements for exceptional circumstances will been posted on eve.

Bonus

Submit the bonus project as a separate ASM file with the practical number as `P02_B`. Failure to do so will result in issues with marking the normal practical and lead to a loss of marks!

Instead of just five heart rate readings, the user can provide a set of any amount of readings. Display the rounded average heart rate and the maximum heart rate for the set. The program must still continue to ask the user if they wish to enter another set.

Mark sheet

1.	Design	**[05]**
2.	Exit loop	**[05]**
3.	Calculate average with rounding	**[05]**
4.	Calculate maximum	**[05]**
5.	Display correct average and maximum	**[05]**
6.	Structure and layout (no temporary variables, correct data types)	**[05]**
7.	Commenting	**[05]**
8.	Correct execution	**[35]**
9.	Handle sets of heart rate readings of varying size	**[10 (bonus)]**
	Total	**[70]**

NB

Submissions which **do not assemble** will be capped at 40%!

Practical marks are awarded subject to the student's ability to explain the concepts and decisions made in preparing the practical assignment solution.

(Inability to explain code → inability to be given marks.)

Execution marks are awarded for a correctly functioning application and not for related code.

Reminder

Your submission must follow the naming convention below:

`SURNAME_INITIALS_STUDENTNUMBER_SUBJECTCODE_YEAR_PRACTICALNUMBER`

Example: `Berners-Lee_TJ_209912345_CSC03B3_2024_P02`

Surname	Berners-Lee	**Module Code**	CSC03B3
Initials	TJ	**Current Year**	2024
Student number	209912345	**Practical number**	P02

Your submission must be **a single zip (compressed) file**!

Your submission must include the following:

File	**Naming**	**Folder**	**Purpose**
`Design`	`STUDENTNUMBER_P02.pdf`	`docs`	Contains your program design. All files must be in **PDF** format. Your details must be included at the top of any **PDF** files submitted[0].
`Source`	`STUDENTNUMBER_P02.asm`	`src`	Contains all relevant source code. Your details must be included at the top of the source code[0].

Multiple uploads

Note that only **one** submission is marked. If you already have submitted once and want to upload a newer version then submit a newer file with the same name as the uploaded file in order to overwrite it.

[0] Failure to correctly indicate your details will result in a penalty.