Computer Science 3B

Practical Assignment 03

Assignment date:	2025-08-07
Deadline	2025-08-07 17h00
Marks: 70	

This practical assignment must be uploaded to eve.uj.ac.za **before** 2025-08-07 17h00. 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 assignment.

Dystopian Factory Conglomerate is moving forward with their plans for factory production. The last step in the process is dealing with inputs. Previously we have only discussed outputs. Each product will require multiple inputs.

Write an **80x86** assembly program that will calculate the required inputs for a given production line:

$$\texttt{numberOfLines} = \frac{\texttt{requiredAmount}}{\texttt{outputPerMin}}$$

$$\vec{\texttt{requiredInput}} = \texttt{numberOfWholeLines} \times \vec{\texttt{inputPerMin}}$$

where

requiredAmount	- Required amount of products	- integer	- **INPUT**
outputPerMin	- Products output per minute	- integer	- **INPUT**
$\vec{\texttt{inputPerMin}}$	- Required input per minute	- array	- **INPUT**
numberOfLines	- Number of production lines required	-	- **CALCULATED**
numberOfWholeLines	- numberOfLines rounded up	-	- **CALCULATED**
$\vec{\texttt{requiredInput}}$	- Input required for production	- array	- **OUTPUT**

The program must display the following:

- The input values that were provided by the user.
- The required total input based on the number of lines.

Your program must continually ask the user if they want to process another product. You are only allowed to create global integer variables for **requiredAmount**, **ouutputPerMin**, and $\vec{\texttt{inputPerMin}}$. Any number of global string prompts can be used.

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

Testing set - Use these values to test your program:

Required Amount	Output per minute	Input per minute	Production Lines		Required input
			Fractional	Whole	
60	12	[1, 1, 0, 0, 0]	5	5	[5, 5, 0, 0, 0]
60	60	[2, 2, 1, 0, 0]	1	1	[2, 2, 1, 0, 0]
120	24	[3, 3, 3, 2, 2]	5	5	[15, 15, 15, 10, 10]
100	24	[3, 3, 3, 2, 2]	$4.1\overline{66}$	5	[15, 15, 15, 10, 10]
2000	72	[10, 3, 2, 0, 2]	$27.\overline{77}$	28	[280, 84, 56, 0, 56]

Mark sheet

1. Design **[05]**
2. Exit loop **[05]**
3. Fill array **[05]**
4. Modify array **[05]**
5. Display array **[05]**
6. Structure and layout (no temporary variables, correct data types) **[05]**
7. Commenting **[05]**
8. Correct execution. **[35]**

NB

Submissions that **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_2025_P03`

Surname	Berners-Lee	**Module Code**	CSC03B3
Initials	TJ	**Current Year**	2025
Student number	209912345	**Practical number**	P03

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

Your submission must include the following:

File	**Naming**	**Folder**	**Purpose**
`Design`	`STUDENTNUMBER_P03.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_P03.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.