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Submission author: James Haddad
Assignment title: FINAL - Individual poster - (15%)
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Little Man Computer educational game
A game that teaches students how the Von Neumann architecture and assembly code works.

By: James Haddad
Email: jh1662@canterbury.ac.uk
Supervisor: Tina Eager

Canterbury Christ Church University

Problem:
Education is a vital necessity for one's path in the future; however, most people only do the bare minimum to pass each education stage (Sharpen, 2014; Mauliya et al., 2020). This is due to the fact that the education system not only discourages people from entering advanced education (Mauliya et al., 2020) beyond what is legally required, but also creates a sense of competition where the value for the individual is multiplied for the collective of society - causing academic stagnation (Sharpen, 2014).

Proposal:
The proposed product is an educational game, of a CPU simulator, in LMC standard. It is suited for the age range of teenagers and adults in the modern era. It can also be used by younger people and teachers. It will be a major improvement over the existing LMC simulators.

Agile Development
Image from shutterstock: <https://tinyurl.com/39yqycu>

LMC simulated architecture:
Figure 1: The original von Neumann architecture (Eigeman and Lipp, 1998).
Figure 2: The von Neumann architecture in modern computers (Eigeman and Lipp, 1998) comparing the original 1945 von Neumann architecture to it in modern computers. Diagrams copied and supported by Arikpo et al. (2007).

For making student learning of the processor more enjoyable.

For helping underqualified teachers.

For promoting learning by following the learning theories.

priorities:

	Offline (1 st)	Online (1 st)
In class (1 st)	Progressive Web App for Desktop (landscape)	Desktop webpage (landscape) - default
On the go (2 nd)	Progressive Web App for mobile (portrait)	Mobile webpage (portrait)

Timeline: (simplified from GANTT chart)

	January	February	March	April	May
Literature review and requirements analysis.					
1 st and 2 nd Sprints.					
3 rd sprint with volunteers testing.					
Porting to multiple app types and finish the dissertation.					
Spare time for inconsistencies.					

UK Secondary schools: (2023/24)
Data from gov.uk - <https://tinyurl.com/28m07yv>

	Hours taught	Specialised teachers
Computer Science	66,216 (1.08%)	7,862 (3.43%)
Total	3,768,681	232,765

Education by learning theories:

Behaviorism	Cognitivism
Humanism	Constructivism

More theories:

- Multiple Intelligences Theory
- Situated Learning Theory
- Mindset Theory

Frameworks:

References:

- Arikpo, I.I., Ogbu, F.U. and Eteng, I.F. (2007). Von Neumann architecture and modern computers. *Global Journal of Mathematical Sciences*. [online] doi:<https://doi.org/10.4314/gjms.v6i2.2145>.
- Eigeman, D. and Lipp, T. (1998). *Computer Architecture: From Von Neumann Computers*. Wiley Encyclopedia of Electrical and Electronics Engineering. [online] <https://publit.calithetron.edu/~reinhart/CS521/1998/vonNeumann.pdf>.
- Hossain, M. and Sharmin, S. (2015). *Analysis of Social Networks of Students From A University Program for Seniors*. *ScienceDirect*. [online] doi:<https://doi.org/10.1016/j.sbspro.2015.04.642>.
- Mauliya, R., Sharpen, R. and Rokhyati, U. (2020). Lack of motivation factors creating poor academic performance in the contexts of graduate English department students. *Linguists*. [online] <https://pdfs.semanticscholar.org/f94e/d63e2b7ea48885cbe3cb856ef172d589.pdf>.

72 /100

IS40/IP40 Poster Marking Scheme Feedback

* Delete as appropriate

Candidate: James Haddad

Title: Little Man Computer Educational Game

Supervisor: Tina Eager

2nd Marker: Vijay Sahota

	Weight %	Supervisor Rating/10*	2 nd Marker Rating/10*	1st Mark	2nd Mark	Weighted
Content - Items presented are related to the project; Highlight key issues/contribution; Use precise language;	33.333333	7	7	23.3333	23.33333	
Layout and Design - Graphical illustration, neat presentable (uncluttered) and aesthetically pleasing; Good presentation - Clear and logic.	33.333333	7.5	7	25	23.33333	
Presentation and Defending - Able to answer correctly to questions related to the presented facts, theories and process, Demonstrate knowledge gain from the project.	33.333333	8	7.5	26.6667	25	
Total %	100	75	71.666667	75	71.6667	

1st Marker Overall Mark 75

2nd Marker Overall Mark 71.666667

OVERALL MARK (ROUNDED): 73

* Rating Scale	
0	Non-existent
0.1 - 3.4	Poor
3.5	Narrow fail
4	Just Acceptable, but less than adequate
5	Adequate
6	Good
7	Very good

Supervisor's Report:

Clear uncluttered design and poster containing relevant sections. Good clean layout. Content sections clearly labelled and explained. Fluent discussion. Well prepared. Clear.

Alternative Criteria:

N/A' or Alternative Criteria Justification.

ASSESSMENT REQUIREMENTS

Course Name	Computing Suite		
Module Title	Individual Project		
Module Code	U10834		
Module Start Date / Cohort	September 2024/ Advent – Easter		
Module Level	6	Assessment Type(s)	CW (Poster)
Word Length / Duration	1500 equivalent	% weighting	15%
Deadline (date & time) for Submission	17 January 2025 (2pm deadline)	Format/Location of submission	<p><i>Electronic copy via Turnitin bucket</i></p> <p><i>FINAL Submission - Assessment 1, (electronic submission file naming requirements, etc are provided below).</i></p> <p><i>Presentation on 21 January 2025 at VH building in person</i></p>

Assessment Feedback

In this section include details of

- 7 February 2025 (14:00)
- ON BLACKBOARD

Detailed Assessment Guidance

The Individual Project module must be passed without compensation or condonement in line with the University regulations. This is also in line with requirements of relevant professional bodies.

Assessment 1 of the module is based on various criteria, including the following:

- have you achieved what you set out to achieve?
- has your work been organised sensibly?
- have your results been well presented?
- how well do you understand what you have done?
- do you have some critical perspective on your work?

Module Learning outcomes covered by this assessment:

1. demonstrate an ability to pursue a significant sized piece of academic study which is self- directed and meets a real need;
2. synthesise information, ideas and practices to provide quality products/solutions;
3. investigate an existing system, if any, (critically appraising its effectiveness, quality, usability, etc.), specify the requirements for a replacement system and then design, test and implement a fully documented, reliable and maintainable software artefact to meet those requirements, in a timely fashion;
4. recognise, critically discuss and demonstrate an understanding of and take appropriate action regarding social, professional, legal, ethical and risk/safety issues relating to the area of study as appropriate;
5. critically analyse, evaluate and discuss all aspects of their completed Individual Project including its theoretical, technological, financial, commercial and organisational context, along with any implications for future work, as appropriate.

Assessment 1 will require students to:

Submit a poster and deliver a poster presentation giving a short informal demonstration of their work to their supervisor, second marker and their peers.

The poster submission should report on the current stage of your work and include introduction, aim and objectives, methodology (e.g. systems analysis and design if relevant), expected outcomes, relevant previous

work, a plan of work etc. It should highlight key issues/contributions and use graphical illustrations to convey concisely and in an aesthetically pleasing way the main aspects of the work.

You are required to:

1. **Submit your Poster, by the submission deadline stated above, as a single PDF file via Turnitin using the following descriptor:**
 - Document Name: 2024-25_Assessment1_Poster_<Your Full Name>
2. **Print your Poster in A3 or A2 size and display it during the poster presentation day.**
3. **Deliver a presentation of your work, during the poster presentation day, to supervisor, second marker and answer their questions.**

Recommendations for the project presentation:

- Get your poster ready at least 1 week before deadline
- Print your poster at least 2-3 days before the poster presentation date
- Get feedback from your supervisor before your poster submission

The demonstration gives the student the opportunity to demonstrate their work in the best possible light. In addition, the demonstration will be used by the supervisor and second marker to seek clarification on students' work and related methodology and planning.

The Poster and Poster presentation will be marked on Content; Layout and Design; and Presentation and Defending. The marking scheme details can be found in the relevant Blackboard and at the end of this document.

Each submission is marked by two members of staff, namely your supervisor and another member of the staff (the second marker). The second marker's job is to provide a 'second opinion' on the work from the point of view of somebody who only sees the finished product and has no prior knowledge of it. In some cases, a submission will be marked by a third marker and all Individual Studies will, of course, be open to the scrutiny of the External Examiner.

Contact for Queries

If you need additional guidance or clarification, please check the module blackboard first before contacting the module team.

If you feel that you might miss a submission deadline, then you can apply for a short extension by making an "Extenuating Circumstances" claim. For details on how to do this, follow this link:

(<https://www.canterbury.ac.uk/our-students/ug-current/academic-services/assessments/extenuating-circumstances>).

For submission of extension:

<https://www.canterbury.ac.uk/guides/assessments/submit-an-exceptional-circumstances-request>

If you experience any problems with the system, please contact the Administration Team at:
computing@canterbury.ac.uk

For module-related queries please contact your module leader: Prof. Konstantinos Sirlantzis,
Konstantinos.Sirlantzis@canterbury.ac.uk

Confidentiality/Anonymity Requirements

This assessment is double marked (see [marking procedures \(canterbury.ac.uk\)](#) and it is exempt from anonymous marking (see [Anonymous-Marking-Policy-AB-approved-June-2023-Final.pdf \(canterbury.ac.uk\)](#)).

See also, <https://www.canterbury.ac.uk/our-students/ug-current/academic-services/assessments/exams-and-coursework-procedures>.

Ethical Requirements

All submissions must adhere to the Data Protection Act (1998). Adherence to this act is your responsibility. Your supervisor will provide guidance where appropriate. All personal data must be omitted and/or aggregated and/or anonymised, as appropriate, to ensure that no individual can be identified from it. The University will not, under any circumstances, accept any Individual Project submission that fails to comply with this requirement and will return such submissions to the candidate for amendment.

All submissions must adhere to the specified ethics requirements in particular those detailed in the University's Governance and Ethics information ([Governance and Ethics - Canterbury Christ Church University](#)) and Student Academic Integrity Policy ([Student-Academic-Integrity-Policy-2024.pdf \(canterbury.ac.uk\)](#)). Such adherence is **your responsibility**. Your supervisor will provide guidance where appropriate. ***The University will not, under any circumstances, accept any Individual Project module submission that falls foul of this requirement and will return such submissions to the candidate for amendment.***

Referencing

Your work must be adequately referenced throughout, using the Harvard referencing style. For the University guide to referencing use this link [Introduction to referencing](#).

Marking Criteria

Provided in the next page.

Further Information

State where additional assessment guidance/brief can be found, including in the Module Handbook.

Prepared by: Prof. K. Sirlantzis

Date last updated: Jan. 2025

Validity: valid for academic year 2024/25

Version number: 2

Marking Rubric

Assessment 1: Poster and Poster Presentation

Criteria:

1. Content (33.333%)

- **Very Good/Excellent (70-100%):** Comprehensive, accurate, and highly relevant. Well-organized with clear introduction, methodology, results, and conclusions.
- **Good (60-69%):** Thorough and relevant. Organized with introduction, methodology, results, and conclusions.
- **Satisfactory (40-59%):** Adequate and mostly relevant. Includes basic elements but may lack depth or clarity.
- **Fail (0-39%):** Inadequate and not relevant. Lacks essential elements and organization.

2. Layout and Design (33.333%)

- **Very Good/Excellent (70-100%):** Visually appealing and highly effective. Professional design with clear flow of information.
- **Good (60-69%):** Visually appealing and effective. Balanced design with clear flow of information.
- **Satisfactory (40-59%):** Adequate but may have readability or visual appeal issues. Somewhat balanced design.
- **Fail (0-39%):** Very poorly designed and not visually appealing. No clear flow of information.

3. Presentation and Defending (33.333%)

- **Very Good/Excellent (70-100%):** Clear, confident, and engaging presentation. Effectively uses visual aids. Answers questions confidently and accurately, demonstrating deep understanding.
- **Good (60-69%):** Clear and confident presentation. Uses visual aids effectively. Answers questions accurately, demonstrating good understanding.
- **Satisfactory (40-59%):** Adequate presentation but may lack confidence or clarity. Uses visual aids somewhat effectively. Answers questions adequately, demonstrating basic understanding.
- **Fail (0-39%):** Very unclear and lacks confidence. No use of visual aids. Unable to answer questions, demonstrating little to no understanding.

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Problem:

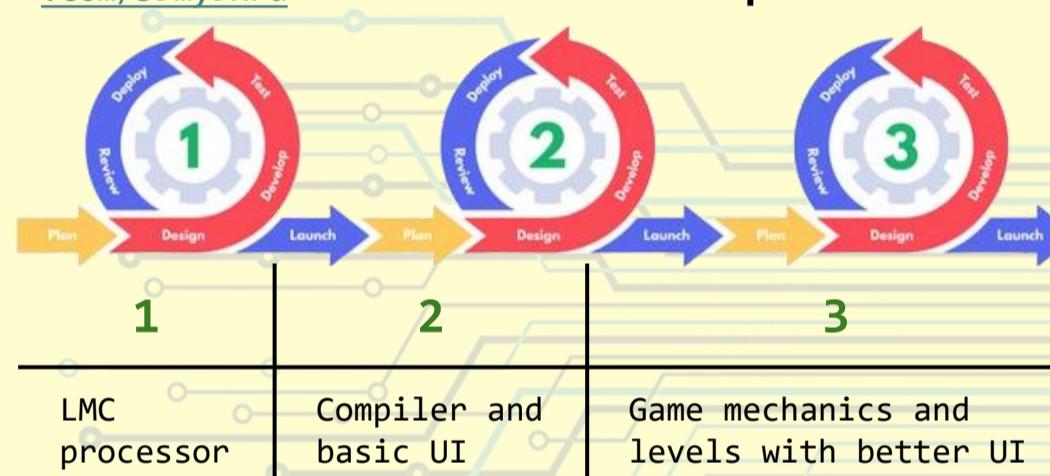
Education is a vital necessity for one's path in the future; however, most people only do the bare minimum to pass each education stage (Sharpes, 2014; Mauliya et al., 2020). Not only does this risk failing higher education but also discourages people from entering advanced education (Mauliya et al., 2020) beyond what is legally required or beyond living a good enough life. The problem for the individual is multiplied for the collective of society - causing academic stagnation (Sharpes, 2014).

Proposal:

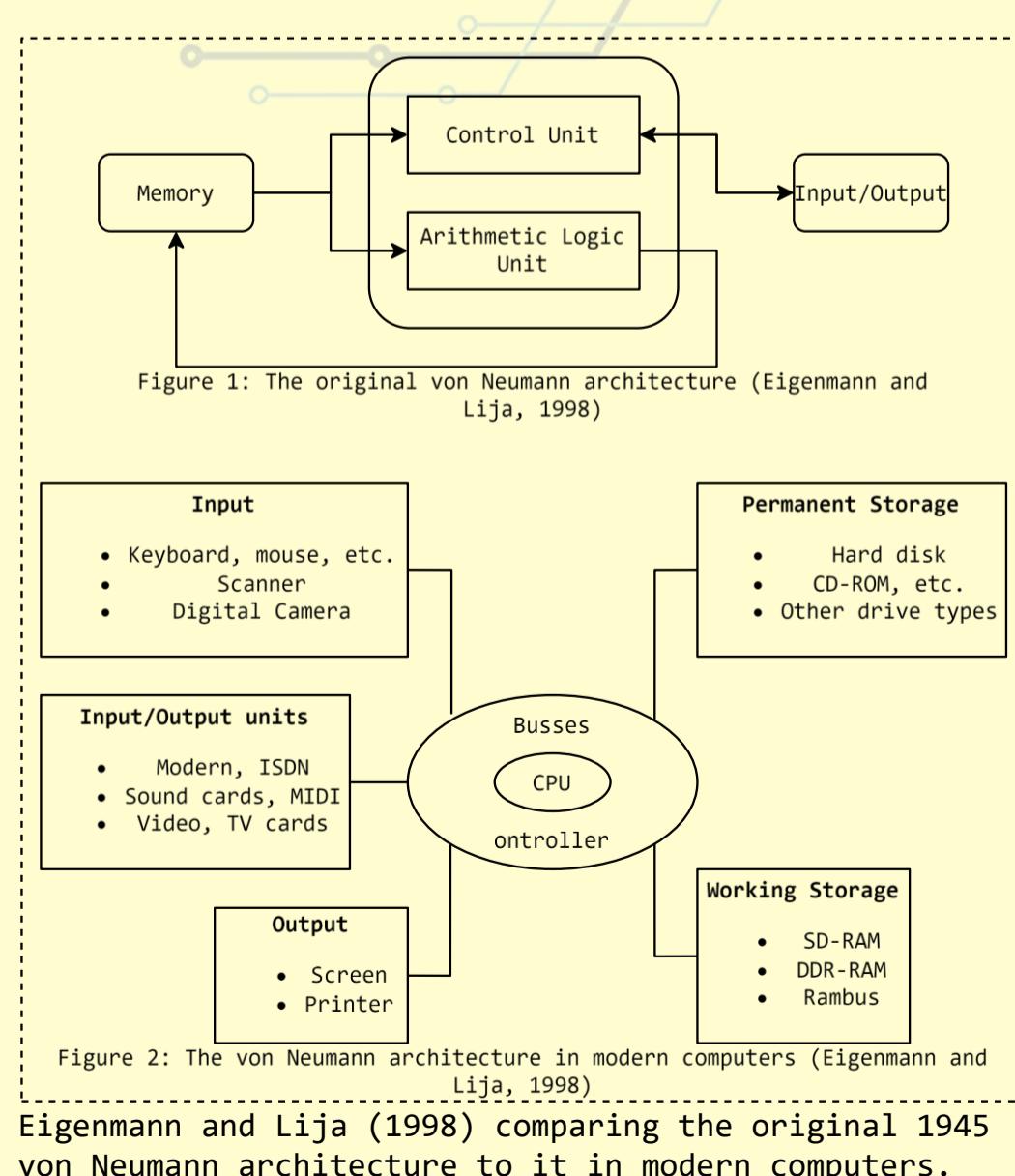
The proposed product is an educational game, of a CPU simulator, in LMC standard. It is suited for the age range of teenagers (13-18) as the main audience but will also be used by younger people and teachers. It will be a major improvement over the existing LMC simulators.

Image from shutterstock:
<https://tinyurl.com/39my9xru>

Agile Development



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Eigenmann and Lija (1998) comparing the original 1945 von Neumann architecture to it in modern computers. Diagrams copied and supported by Arikpo et al. (2007).

For making student learning of the processor more enjoyable.

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UK Secondary schools: (2023/24)

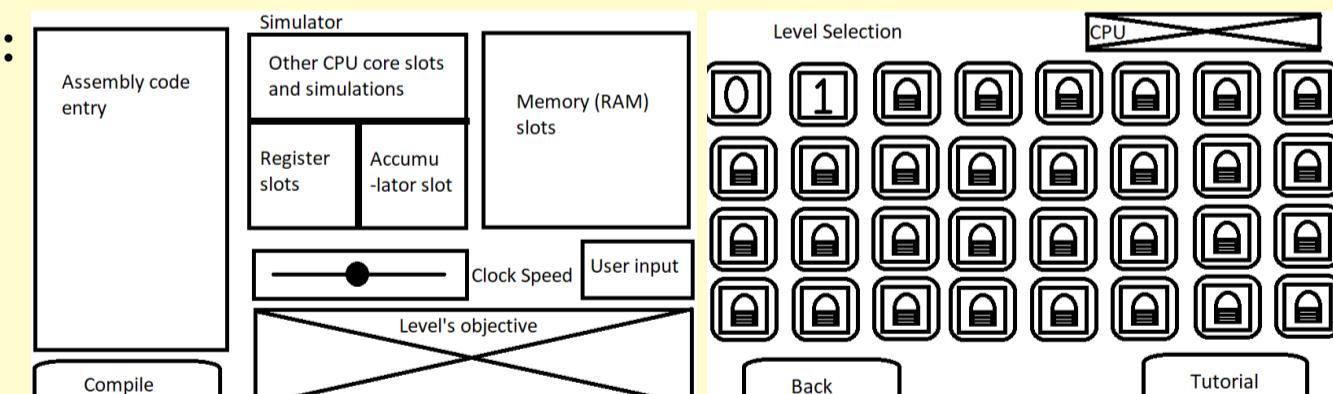
Data from gov.uk - <https://tinyurl.com/2kw6nb7y>

	Hours taught	Specialised teachers
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Comparing language candidates:

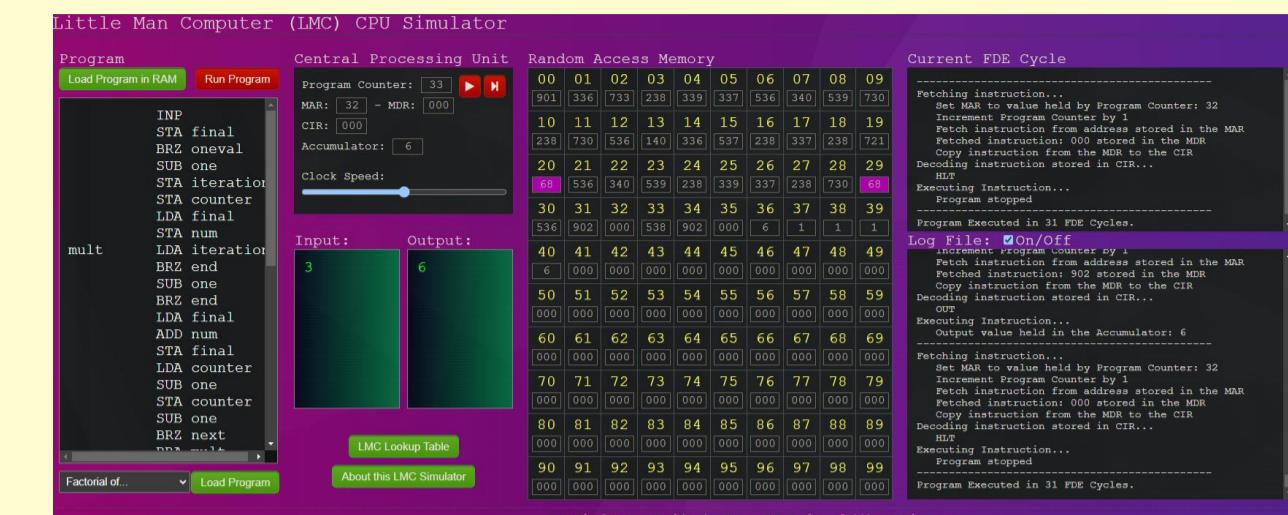
	JavaScript	TypeScript	Kotlin
Compatibility	Natively understood and interpreted by browsers	Compiles to JS	Compiles to JS
Handling variables	Dynamic typing	Static typing	Static typing
Strictness	Loosely typed	Strongly typed	Strongly typed
Support	Massive community and lots of libraries and guides	TS is a superset of JS	Interoperability with JavaScript
Debugging capability	Adequate debugging capability	Strong debugging capability	Strong debugging capability
Learning curve and difficulty	Best for beginners (easy) but complex for advanced features	Similar to JS with type safety and error checking but has more features to learn	Also have more features but different to JS, more towards android app development

Frameworks:



References:

- Arikpo, I.I., Ogban, F.U. and Eteng, I.E. (2007). Von Neumann architecture and modern computers. Global Journal of Mathematical Sciences. [online] doi:<https://doi.org/10.4314/gjmas.v6i2.21415>.
- Eigenmann, R. and Lilja, D.J. (1998). Von Neumann Computers. Wiley Encyclopedia of Electrical and Electronics Engineering. [online] <https://public.callutheran.edu/~reinhart/CSC521/Week3/VonNeumann.pdf>.
- Muhajirah, M. (2020). Basic of Learning Theory: (Behaviorism, Cognitivism, Constructivism, and Humanism). International Journal of Asian Education). [online] <https://doi.org/10.46966/ijae.v1i1.23>.
- Sharpes, D. K. (2014). A Long-Term Analysis of Social Networks of Students From a University Program for Seniors. ScienceDirect. [online] doi:<https://doi.org/10.1016/j.sbspro.2015.04.642>.
- Mauliya, I., Relianisa, R., & Rokhyati, U. (2020). Lack of motivation factors creating poor academic performance in the context of graduate English department students. Linguists. [online] <https://pdfs.semanticscholar.org/f94e/d6362c07ea4b88c5cbe3cb8b56ef1724d509.pdf>.



Other LMC screenshots:

The screenshot above is from <https://www.101computing.net/LMC> while the one to the right is from <https://peterhigginson.co.uk/lmc/>



Education by learning theories:

(Muhajirah, 2020)

Behaviorism

Cognitivism

Humanism

Constructivism

More theories:

- Multiple Intelligences Theory
- Situated Learning Theory
- Mindset Theory