

E-LEARNING SYSTEM TO MANAGE THE LESSON BETWEEN THE TEACHER AND THE STUDENT

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Abstract

The e-learning system is a web-based application that was developed by leveraging MySQL as a database management system and PHP as an interface language for the users. Both of these technologies were utilised in the construction of the system. During the course of the development process, both of these technological modalities were utilised. Both of these technologies owe their origins to the open-source community, which was responsible for their development. This platform enables teachers to upload their lectures and enables students to view the uploaded lectures anytime they choose to do so; as a consequence, the learning process is aided in a manner that is both simpler and more expedient. This programme also makes the process of learning more accessible to students in a manner that is more expedient.

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Introduction

Overview

E-learning systems are online platforms that deliver education and training using digital technologies. They allow learners to access courses and learning materials from anywhere, at any time, using a computer, tablet or smartphone. E-learning systems provide a flexible, personalized and interactive learning experience, incorporating multimedia content, assessments, and feedback mechanisms. They can support a variety of learning styles and needs, and are often used by organizations and educational institutions to provide cost-effective and scalable education solutions. E-learning systems have become increasingly popular in recent years, particularly in response to the COVID-19 pandemic. (1)

Review and goals of E-learning system

With the phenomenal growth of information, increased student diversity, new learning theories and ready access to the internet, today's teachers are being presented with an opportunity to transform the learning in their classrooms from a traditional transmission model to a student-centered model. There are many reasons for institutions to adopt an E-learning system. One of the reasons is the faster distribution of content.

E-learning systems also aims do the following:

1. Breaking the barriers of time and space: One of the key goals of e-learning systems is to provide a learning experience that is not restricted by time and space. With e-learning, learners can access courses and learning materials from anywhere in the world, at any time of the day or night. This makes learning more convenient and accessible, and allows learners to fit their education around their other commitments.
2. Tailoring learning to individual needs: E-learning systems aim to provide a personalized learning experience that is tailored to the individual needs and preferences of each learner. By using data analytics and adaptive learning technologies, e-learning systems can adjust the content and pace of learning to suit the abilities and learning styles of each individual.
3. Enhancing engagement and motivation: E-learning systems aim to make learning more engaging and motivating for learners. By incorporating multimedia elements, interactive simulations, and gamification techniques, e-learning systems can make learning more fun and enjoyable, and encourage learners to take an active role in their own learning.
4. Building a community of learners: E-learning systems aim to create a sense of community among learners, regardless of their geographic location. By providing opportunities for collaboration, discussion, and peer-to-peer learning, e-learning systems can foster a sense of shared purpose and belonging among learners.

Concepts and principles

The background theory of e-learning systems is based on the principles of constructivism, which emphasizes the active and collaborative construction of knowledge by learners. In e-learning systems, learners are provided with a flexible, interactive, and personalized learning experience that allows them to construct their own understanding of the material through exploration, reflection, and collaboration.

E-learning systems also draw on the principles of cognitive load theory, which suggests that learning is most effective when the cognitive load on learners is optimized, balancing the complexity of the material with the capacity of the learner's working memory. By incorporating multimedia elements and interactive activities, e-learning systems can help to reduce cognitive load and enhance learners' understanding and retention of the material. Additionally, e-learning systems may incorporate elements of social learning theory, which emphasizes the importance of social interaction and collaboration in learning. Overall, the background theory of e-learning systems is based on a variety of psychological and educational theories, aimed at promoting effective and engaging learning experiences for learners

2.3. Tools used in designing the application

The following tools used in building the project:

- a. PHP
- b. MySQL
- c. WAMP server
- d. HTML
- e. CSS
- f. JAVASCRIPT

a. PHP

PHP is a server-side programming language that is used to create dynamic web applications and websites. It is a popular choice for web developers due to its flexibility, ease of use, and ability to work seamlessly with databases and other web technologies. PHP code is executed on the server side, allowing developers to create dynamic content that can be customized based on user input and other variables. PHP is open source and has a large community of developers and users, making it easy to find resources and support for building web applications.(1)

b. MySQL

MySQL is a popular open-source relational database management system that allows users to store, manage, and retrieve data from their web applications. It is designed to be fast, reliable, and scalable, making it a popular choice for web developers and organizations of all sizes. MySQL can be used in conjunction with a variety of programming languages and web frameworks, allowing developers to build powerful and dynamic web applications. With its robust set of features and ease of use, MySQL has become a cornerstone of modern web development.

c. XAMPP server

XAMPP is a free and open-source cross-platform web server solution that provides developers with a complete environment for testing and deploying web applications. It includes Apache, MySQL, PHP, and other software components necessary for running web applications on a local machine. XAMPP is easy to install and configure, making it an ideal solution for web developers looking to set up a local development environment quickly and efficiently. With XAMPP, developers can test and debug their applications locally before deploying them to a live server, streamlining the development process and improving the overall quality of their web applications.(1)

d. HTML

HTML (Hypertext Markup Language) is a fundamental building block of the World Wide Web. It is a markup language used to structure and format content on web pages, including text, images, and multimedia. HTML provides a standardized set of tags and attributes that can be used to define the structure and layout of a web page, making it easy for developers to create web pages that are accessible and easy to use. With its simple syntax and broad support across all major web browsers, HTML is a cornerstone of modern web development.

e. CSS

CSS (Cascading Style Sheets) is a language used to style and visually enhance

HTML content. It allows web developers to control the layout, appearance, and presentation of web pages, including fonts, colors, and page layout. By separating the presentation layer from the content layer, CSS makes it easier to maintain and update the look and feel of a web page.

f. JAVASCRIPT

JavaScript is a high-level programming language that is used to create dynamic and interactive web applications. It is a versatile language that can be used for a wide range of tasks, from simple form validation to complex animations and data visualizations. With its broad support across all major web browsers, JavaScript has become an essential tool for modern web development.

Instructional Design for E-learning system

Instructional design is the process of creating educational and training materials that effectively support learning and achieve specific learning objectives. In the context of e-learning systems, instructional design plays a crucial role in ensuring that learners have a positive, engaging, and effective learning experience. we'll explore some key considerations for instructional design in e-learning systems, including the

importance of understanding learners' needs, creating engaging and interactive content, and evaluating the effectiveness of e-learning programs.

a. Understanding Learners' Needs

The first step in instructional design for e-learning systems is to understand the needs and characteristics of the target audience. This involves considering factors such as their prior knowledge and experience, learning styles and preferences, and cultural background. It's important to keep in mind that e-learning systems may be used by learners from a wide range of backgrounds and contexts, so it's essential to design learning materials that are accessible, inclusive, and relevant to diverse learners

b. Creating Engaging and Interactive Content

Once the needs and characteristics of the target audience have been established, the next step is to design learning materials that are engaging, interactive, and effective. E-learning systems can incorporate a variety of multimedia elements, such as videos, animations, simulations, and games, to enhance the learning experience and cater to different learning styles. Interactive elements, such as quizzes, assessments, and discussion forums, can help learners to apply and reinforce their learning, and encourage collaboration and peer-to-peer learning. The use of multimedia and interactive elements can help to make e-learning materials more interesting and engaging for learners, and improve their retention and transfer of knowledge and skills.

c. Designing Effective Assessments

Assessments are a key component of instructional design for e-learning systems, as they provide learners with feedback on their progress and help to reinforce their learning. Assessments can take various forms, such as quizzes, tests, assignments, and projects, and should be aligned with the learning objectives and content of the course. It's important to design assessments that are challenging and meaningful, and that provide learners with opportunities to apply and demonstrate their learning in authentic contexts.

d. Evaluating the Effectiveness of E-Learning Programs

The final step in instructional design for e-learning systems is to evaluate the effectiveness of the program. This involves gathering data on learner performance and behavior, as well as feedback from learners and instructors, to identify areas for improvement and refinement. Evaluation data can be used to refine the content, design, and delivery of e-learning programs, and to ensure that they are meeting the learning objectives and needs of the target audience.

In conclusion, instructional design plays a crucial role in creating effective e-learning systems that support learning and achieve specific learning objectives. Instructional designers need to take into account the needs and characteristics of the target audience, create engaging and interactive content, design effective assessments, and evaluate the effectiveness of e-learning programs. By following these principles, instructional designers can create e-learning systems that are effective, engaging, and impactful, and that provide learners with a positive and rewarding learning experience.

system layout

After the admin enters the right username and password the home page will display. Figure (3-1) shows the Admin Flowchart, figure (3-2) shows the user Flowchart whether this user is teacher or student.

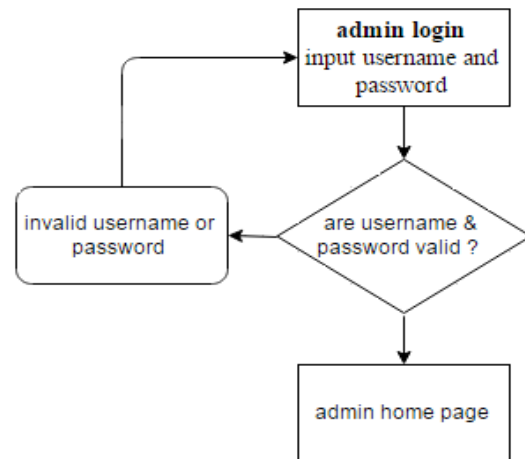


Figure (3-1): Admin Flowchart

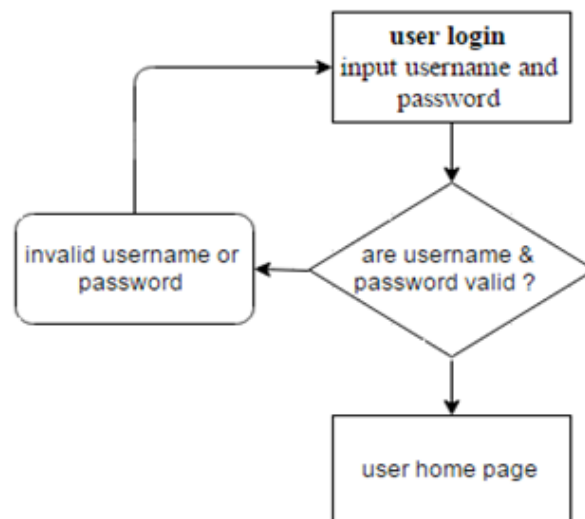


Figure (3-2): User Flowchart

database design

The E-learning platform system has six tables

- ✓ user
- ✓ teacher
- ✓ student
- ✓ class
- ✓ ads
- ✓ pictures

The first one is the admin table which has three columns

- ✓ id
- ✓ username
- ✓ password

The second one, the teacher table is the same as admin table, also has three columns (the id, username and password), as shown in their structure in figure (3-3) and figure (3-4).

#	Name	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> 1	id	int(99)			No	None	AUTO_INCREMENT	Change Drop Primary Unique Index Spatial Fulltext More
<input type="checkbox"/> 2	user	varchar(88)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More
<input type="checkbox"/> 3	password	varchar(88)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More

Figure (3-3): the structure of admin table

#	Name	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> 1	id	int(99)			No	None	AUTO_INCREMENT	Change Drop Primary Unique Index Spatial Fulltext More
<input type="checkbox"/> 2	user	varchar(88)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More
<input type="checkbox"/> 3	password	varchar(88)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More

Figure (3-4): the structure of teacher table

The third one is student table which contain the following columns

- ✓ id
- ✓ name
- ✓ password
- ✓ class

And the structure of this table shown in figure (3-5).

#	Name	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> 1	id	int(11)			No	None	AUTO_INCREMENT	Change Drop Primary Unique Index Spatial Fulltext More
<input type="checkbox"/> 2	name	varchar(255)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More
<input type="checkbox"/> 3	pass	varchar(255)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More
<input type="checkbox"/> 4	class2	varchar(255)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More

Figure (3-5): the structure of student table

The forth table is class which contain

- ✓ id
- ✓ name

And its structure shown in figure (3-6).

#	Name	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> 1	id	int(11)			No	None	AUTO_INCREMENT	Change Drop Primary Unique Index Spatial Fulltext More
<input type="checkbox"/> 2	name	varchar(255)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More

Figure (3-6): the structure of class table

The fifth table is ads which contain

- ✓ id
- ✓ description
- ✓ class
- ✓ type
- ✓ teacher

And its structure shown in figure (3-7).

#	Name	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> 1	id	int(11)			No	None	AUTO_INCREMENT	Change Drop Primary Unique Index Spatial Fulltext More
<input type="checkbox"/> 2	des	varchar(255)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More
<input type="checkbox"/> 3	class2	varchar(255)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More
<input type="checkbox"/> 4	type2	varchar(255)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More
<input type="checkbox"/> 5	who2	varchar(255)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More

Figure (3-7): the structure of ads table

The last table is pictures which contain

- ✓ id
- ✓ ad_id
- ✓ pic

And its structure shown in figure (3-8).

#	Name	Type	Collation	Attributes	Null	Default	Extra	Action
1	id	int(255)			No	None	AUTO_INCREMENT	Change Drop Primary Unique Index Spatial Fulltext More
2	ward_id	int(255)			No	None		Change Drop Primary Unique Index Spatial Fulltext More
3	pic	varchar(255)	utf8_unicode_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext More

Figure (3-8): the structure of pictures table

webpage design and implementation

The project has three privileges

- ✓ admin mode
- ✓ teacher mode
- ✓ student mode

a. Admin mode

When the admin enters the right username and password the main page will display that shown in figure (3-10), which is the home page.

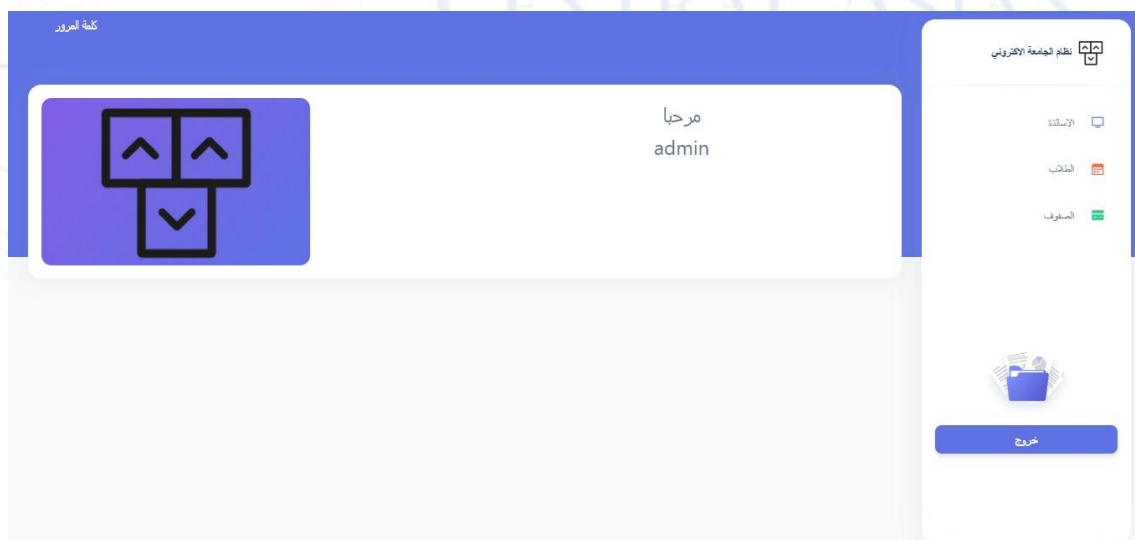


Figure (3-9): the home page

The admin can add teachers, student and classes.

b. Teacher mode

In teacher mode, the teacher can add any new lectures, announcement or degrees, the home page for the teacher is shown in figure (3-10).

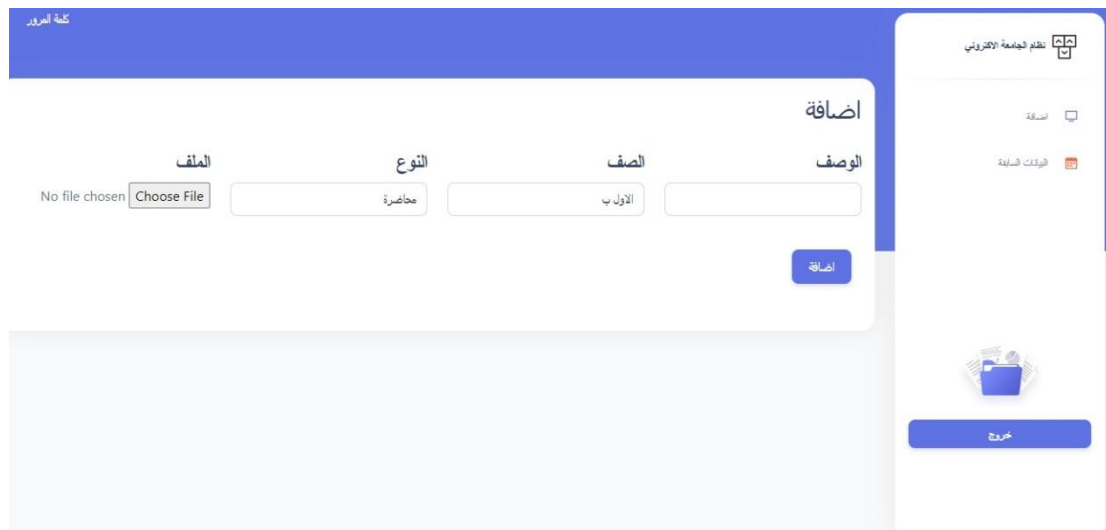


Figure (3-10): the teacher home page

c. Student mode

In student mode, the students can see lectures, announcements or degrees that added to their class, the home page for the student is shown in figure (3-11).

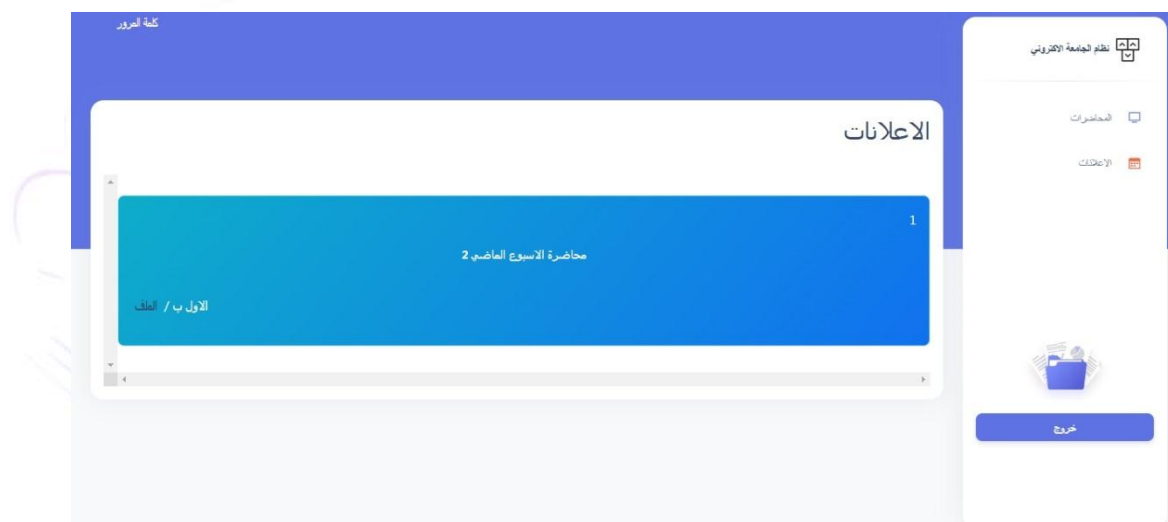


Figure (3-11): the student home page 19

Results

The use of e-learning systems has a wide range of potential benefits and outcomes for learners and organizations. By providing learners with access to flexible, personalized, and interactive learning experiences, e-learning systems can enhance knowledge and skill development, and increase engagement and motivation. E-learning systems can also be more cost-effective and scalable than traditional classroom-based learning, particularly for organizations with geographically dispersed or remote workforces. Additionally, e-learning systems can support ongoing learning and development, allowing learners to refresh and update their skills and knowledge as needed. Overall, the use of e-learning systems can have a positive impact on learners, organizations, universities and society as a whole, by promoting lifelong learning, increasing access to education and training, and supporting the development of a skilled and adaptable workforce..

Conclusions

1. The E-learning platform helps 24/7 access to content for learners.

2. The E-learning platform is easy to implement, and easy to use, users can handle it with short practice.
3. The E-learning platform can be used to enhance the creation and delivery of eLearning content by automatically generating personalized learning materials. PHP and MySQL are the easiest Programming languages that can be used in building a database application.
4. XAMPP server is very powerful application that combines Windows, Apache, MySQL and PHP, and anyone can use it to develop applications without the need of buying a real server to test on.
5. In the future, several other sensors will be added, such as the temperature and humidity sensor, to be sent also through the application, and the project can also be extended from a fixed object to a mobile one that is sent to places containing fires to measure the level of gas leakage or the level of fire occurring in a specific location[14].
6. Excel is most commonly used in business settings. For example, it is used in business analysis, human resource management, operations management and performance reporting. Excel uses a large collection of cells formatted to organize and manipulate data and solve mathematical functions. Users can arrange data in the spreadsheet using graphing tools, pivot tables and formulas. The spreadsheet application also has a macro programming language called Visual Basic for Applications[15].

Future Work

1. Add discussion form, assignment and the ability to students to evaluate the lectures.
2. Add more functions to the admin.
3. Add more columns and information for student.
4. Make the application as mobile app.

References:

1. https://en.wikipedia.org/wiki/Online_learning_in_higher_education
2. <https://www.ispringsolutions.com/blog/learning-goals-and-objective>
3. [https://en.wikipedia.org/wiki/E-learning_\(theory\)](https://en.wikipedia.org/wiki/E-learning_(theory))
4. Joel Murach & Ray Harris, "Murach's PHP and MySQL", Third Edition , Mike Murach & Associates Inc for Publishing, 15 Dec 2014.
5. <https://www.apachefriends.org/>
6. <https://elearningindustry.com/the-impact-of-artificial-intelligence-on-elearning>
7. Robin Nixon, "Learning PHP, MySQL, JavaScript, CSS & HTML5 3ed: A Step-by-Step Guide to Creating Dynamic Websites", Second Edition , O'Reilly Publishing, 3 June 2014 .
8. David R. Brooks , "An Introduction to HTML and JavaScript for Scientists and Engineers" , Springer-Verlag London , 2007 .
9. Bradley, V. M. (2021). Learning Management System (LMS) use with online instruction. International Journal of Technology in Education (IJTE), 4(1), 68-92. <https://doi.org/10.46328/ijte.36>
10. E-Learning Management Systems- A Feature-based Comparative Analysis Journal of Information Systems and Technology Management – Jistem USP , Vol.18, 2021, e202118003 ISSN online: 1807-1775
11. MySQL, available at: <https://en.wikipedia.org/wiki/MySQL>.
12. PHP, available at: <https://en.wikipedia.org/wiki/PHP>
13. Joel Murach & Ray Harris, "Murach's PHP and MySQL", Third Edition , Mike Murach & Associates Inc for Publishing, 15 Dec 2014.3.

14. Ali Hasan Ali 2023. Smart Fire System using IOT. CENTRAL ASIAN JOURNAL OF MATHEMATICAL THEORY AND COMPUTER SCIENCES. 4, 3 (Apr. 2023), 88-113.
15. Hasan Ali , A., M Jebur, H., & Alzamili, Z. marid J. (2023). DESIGN OF A VIRTUAL REALITY SIMULATOR OF A DORMITORY BY USING EXCEL VBA. CENTRAL ASIAN JOURNAL OF MATHEMATICAL THEORY AND COMPUTER SCIENCES, 4(5), 99-119. <https://doi.org/10.17605/OSF.IO/CMY8X>

