

	FORM FOR PROPOSING A TOPIC IN THE SECOND CYCLE OF STUDIES	Oznaka	
		Datum usvajanja	09.04.2020
		Datum/Br. revizije	-
		Stranica	1/1

Department	Department of Information Technologies
Master thesis title:	ETL process for reporting and prediction in healthcare
Mentor/professor - contact:	Assist. Prof. Dr. Zerina Mašetić, zerina.masetic@ibu.edu.ba

Thesis background:	ETL (Extract, Transform, Load) is a process of extracting the data from various source systems, transforming it to a valuable information (through calculations) and finally, loading the data into the Data. When it comes to the ETL in the healthcare field, hospitals and clinics do some manual ETL, as they don't invest in the IT resources required to do this level of work. Automating the ETL process, and using it for reporting and various predictions, which will aid doctors in making decision, will be needed and helpful.
Thesis objective:	The aim of this thesis is to design, develop and utilize ETL process which will be the essential in a clinic/ambulance used by doctors to make decisions and to see reports. The developed system will help doctors in decision making,
Literature:	<ol style="list-style-type: none"> 1. Sellappan Palaniappan, A Tool for Healthcare Information Integration, Journal of Information and Communication Technology, 2020. 2. Manoj Muniswamaiah, Tilak Agerwala, Charles C. Tappert, Context-Aware Query Performance Optimization for Big Data Analytics in Healthcare, IEEE, 2019 3. Boon Keong Seah, An application of a healthcare data warehouse system, INTECH 2013, IEEE

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Department	Department of Information Technologies
Master thesis title:	Analysis and prediction of customer's buying behavior
Mentor/professor - contact:	Assist. Prof. Dr. Zerina Mašetić, zerina.masetic@ibu.edu.ba

Thesis background:	Prediction of the customer's buying behavior can be done from many perspectives. The growth of the Internet has resulted in the growth of the online shopping. Having in mind that shopping can be finished in a few clicks has attracted customers to change in-store shopping with online shopping. Moreover, the recent pandemic situation has contributed to the online shopping much. The proper analysis of the customer behavior and further prediction of it will help online business organization in offering personalized Web support to achieve sales goals including increasing the conversion rate, or enhancing the customer experience in real time.
Thesis objective:	The main research objective of the thesis is to analyze the buying behavior within one region based on the age groups, which will give the insight into what each age group buys, during which day period, what quantity and prices, etc. The results will help marketing agencies in placing the right ad to the right target at the right time.
Literature:	<ol style="list-style-type: none"> 1. Elina Kytö, Markus Virtanen, SariMustonen, From intention to action: Predicting purchase behavior with consumers' product expectations and perceptions, and their individual properties, Food Quality and Preference, 2019 2. Vijayaraghavan et al., Dynamic prediction of online shopper's intent using a combination of prediction models, US10373177B2, 2019 3. Martinez et al., A machine learning framework for customer purchase prediction in the non-contractual setting, European Journal of Operational Research, 2020 4. Sujoy Bag, Manoj Kumar Tiwari, Felix T.S.Chan, Predicting the consumer's purchase intention of durable goods: An attribute-level analysis, Journal of Business Research, 2019

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Department	Department of Information Technologies
Master thesis title:	Wind power prediction using machine learning techniques
Mentor/professor - contact:	Assist. Prof. Dr. Zerina Mašetić, zerina.masetic@ibu.edu.ba
Comentor – contact:	Assist. Prof. Dr. Mirza Šarić, mirza.saric@ibu.edu.ba

Thesis background:	The sustainable integration of wind power into the electricity grid requires a precise prediction method. In this work, we investigate the use of machine learning ensembles for wind power prediction. Together with the weather predictions, machine learning algorithms could be an appropriate approach for it, as they are well suited to short-term predictions with forecast horizons up to a few hours, especially with spatio-temporal information. The selection of the right machine learning algorithm and parameters for wind power prediction might not be easy as the results need to fulfill actual energy markets needs.
Thesis objective:	The main research objective is to predict the wind power based on the previous measurements of wind features, such as speed and direction, using machine learning techniques.
Literature:	<ol style="list-style-type: none"> 1. Ziqiao Liu, Yih-Huei Wan, Wind Power Plant Prediction by Using Neural Networks, IEEE Energy Conversion Conference and Exposition, 2012 2. Clifton et al., Using machine learning to predict the wind turbine power output, Environmental Research Letters, 2013 3. Justin Heinermann, Oliver Kramer, Machine learning ensembles for wind power prediction, Renewable Energy, 2016

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Department	Department of Information Technologies
Master thesis title:	Computational Model for Text Similarity in the Turkish Language
Mentor/professor - contact:	Assist. Prof. Dr. Zerina Mašetić, zerina.masetic@ibu.edu.ba

Thesis background:	Text similarity is one of the important tasks in natural language processing (NLP). For example, search engines need to model the relevance of a document to a query, beyond the overlap in words between the two. Moreover, question-and-answer sites need to determine whether a question has already been asked before. A wide range of the methods could be applied to find the similarity in the meaning between words, such as: baselines, word mover's distance, smooth inverse frequency,
Thesis objective:	The research objective of this thesis is to develop the text similarity system for Turkish language. This system will allow teachers to compare and evaluate the students' works, especially in the online examination approach. However, the application of such system is much wider.
Literature:	<ol style="list-style-type: none"> 1. Yves Peirsman, Comparing Sentence Similarity Methods, 2018 2. Kowser et al., Study on Text Similarity Measure Algorithms For English Language, Master's thesis, 2019 3. Wael H. Gomaa, Aly A. Fahmy, A Survey of Text Similarity Approaches, International Journal of Computer Applications, 2013 4. de Souza J.V.A., Oliveira L.E.S.E., Gumiel Y.B., Carvalho D.R., Moro C.M.C. (2020) Exploiting Siamese Neural Networks on Short Text Similarity Tasks for Multiple Domains and Languages. In: Quaresma P., Vieira R., Aluísio S., Moniz H., Batista F., Gonçalves T. (eds) Computational Processing of the Portuguese Language. PROPOR 2020. Lecture Notes in Computer Science, vol 12037. Springer, Cham

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Department	Department of Information Technologies
Master thesis title:	A computer - aided identification of Salmonella by serotyping
Mentor/professor - contact:	Assist. Prof. Dr. Zerina Mašetić, zerina.masetic@ibu.edu.ba
Co-mentor:	Assist. Prof. Dr. Monia Avdić, monia.avdic@ibu.edu.ba

Thesis background:	Salmonella is a genus in the family Enterobacteriaceae which are Gram-negative, oxidase negative, catalase positive, nonspore forming rods. Serotyping is one of the methods for salmonella identification. It is based on the long-standing observation that microorganisms from the same species can differ in the antigenic determinants expressed on the cell surface. It is one of the classic tools for epidemiological study. The big importance in the clinics would be the computer-aided identification of salmonella, which will help physicians in bacteria identification.
Thesis objective:	The objective of the thesis is to develop a computer program that will store the data obtained by serotyping, use the data, analyze it and give the output for salmonella identification. The program will aid the clinics very much in salmonella identification based on the input data.
Literature:	<ol style="list-style-type: none"> 1. Michael P. Ryan, Jean O'Dwyer, Catherine C. Adley. Evaluation of the Complex Nomenclature of the Clinically and Veterinary Significant Pathogen Salmonella. Biomed Res Int. 2017 2. Bio Rad. Bacterial Serotyping Guide for Salmonella. http://www.bio-rad.com/webroot/web/pdf/fsd/literature/FSD_14-0699.pdf 3. Patrick A.D. Grimont & François-Xavier Weill. Antigenic Formulae of the Salmonella Serovars. WHO 2007.