A Note on User Friendly Academic Result Delivery Toolkit

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ABSTRACT

Accurate, efficient and reliable academic result computation systems are key for the advancement and stability of any academic institution. Result is one of the performance indexes used to evaluate the effectiveness of the lecture, teaching materials and method of teaching adopted by a lecturer. Result is also a parameter used to evaluate and rank the students on academic scale. Hence result is a performance index that can be used to evaluate and rank both the teachers and the students. Based on the aforementioned, there is need for efficient and robust academic result delivery system. This paper showcases a comprehensive academic result presentation and delivery toolkit. Though the software is developed using Python, it is compiled as a standalone executable Graphical User Interface (GUI) toolkit, hence it does not require any installation of any programming language or their dependencies. No programming skill or knowledge is required before using this toolkit. This result toolkit has nineteen main functions, four of which are presented in this paper. The tool is used to prepare Senate format results for University of Jos, authentication and mailing of approved course registration, and presentation and electronic routing (mailing) of results. The tool incorporates a proactive mechanism for withheld results notification, and pending courses to register. The usual practice in University of Jos is that, withheld results and pending courses to register are only made known to the students when results were pasted. But with this tool, pending courses to register are electronically mailed to the students after registration before the commencement of exam. In the same vein, the tool automatically collates all withheld results and the affected students before the results are presented to Senate.
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Keywords: Registration, Senate Format, Graphical User Interface (GUI), Result Disseminations.

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1. INTRODUCTION

Some of the preliminary functionalities of the results and academic record management toolkit were presented in one of our paper. These include: uploading of courses offered by students in a given department, uploading of previous academic records, uploading and validation of course registration, creating new workbook and uploading of course results, computation of cumulative performance indexes, senate format and summary pages, among others. In this paper, the focus is centred on how the tool can be used for effective dissemination of the computed results. The tool is user friendly, developed using Python [1][2], and compiled as a standalone windows application GUI toolkit. Hence no installation of any programming language or their dependencies is required as in some similar software [3] [4] [5]. Correct and timely presentation of results to the right audiences is vital for smooth running of any academic institution. Results are always on demand not just by the students, but also by academic senate members, employers, funding bodies, etc who may wish to know the progress of their scholars. Results manually prepared for presentation or dissemination to this array of audience is time consuming and prompts to error as the result has to be sourced from the original documents and then retyped again before dissemination. To mitigate these deficiencies, a robust automated framework for registration and results dissemination is incorporated in this result computation toolkit. Different means of results presentation were adopted, ranging from dissemination and visualization of individual course results to entire sessional results along with their cumulative performance indexes where applicable. Also, the dissemination can be to just an individual student or the whole students.

2. METHODOLOGY

The software is developed using Python, and compiled as a standalone executable Graphical User Interface (GUI) toolkit, hence it does not require any installation of Python programming language or any dependencies. No programming skill or knowledge is required before using this toolkit.

All the functions to be executed using this tool must be selected from the main GUI depicted by Fig. 1, followed by top level GUIs or message box where applicable. One of the first things to be done by any student at the beginning of any semester or session is course registration. The function: Upload Course Registration is used to upload the course registration prepared in the format shown in Fig. 2 to populate the course registration sheet created by the software. The software will check and deregister any student who register a course for which he/she has not passed the prerequisite, and those that registered courses that they has passed before. The software will put **1** for valid registration, and **P** where the student register course he/she has already passed, and **0** for

courses registered with pending prerequisite. The valid total credit registered will be computed, if it is below the minimum required credit load, it will be coloured blue, and red if is above the maximum required credit load. All pending course (s) to be cleared will be on the summary column of the registration sheet as shown in Fig. 3. Only courses for which the student has a valid registration will be uploaded and assigned to them.

Fig 1: Main GUI

sessions, consequently, some students have extra semester or even session as they were not informed in time.

S/N	MAT.NO	NAME	ME	OPTIO	REMARK	TCR	CHM 101	CHM 103	CHM 105	CHM 106	CS 101	CS 102	MTH 101	MTH 102
UNIVERSITY OF JOS														
FACULTY OF ENGINEERING														
DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING														
100 B.ENG ELECTRICAL AND ELECTRONIC ENGINEERING 2019/2020 SESSION														
							3	1	3	1	2	3	3	3
1	UJ/2015/EN/0120	GH	UME	CE			1	1	1	1	1		1	1
2	UJ/2015/EN/0009	JJ	UME	CE			1	1	1	1	1		1	1
3	UJ/2015/EN/0118	KO	UME	CE			1	1	1	1	1	1	1	1
4	UJ/2015/EN/0023	LP	UME	CE			1	1	1	1	1	1	1	1
5	UJ/2014/EN/0001	MK	UME	CE			1	1	1	1	1	1	1	1
6	UJ/2014/EN/0086	HJ	UME	CE			1		1	1	1	1	1	1
7	UJ/2019/EN/0141	GT	UME	CE			1	1	1	1		1	1	1
8	UJ/2019/EN/0164	JY	UME	CE			1	1	1	1	1	1	1	1
9	UJ/2019/EN/0236	ABU	UME	PAM			1	1	1	1	1	1	1	1
10	UJ/2018/EN/0045	ATBU	UME	PAM			1		1	1	1	1	1	1
11	UJ/2016/EN/0223	UU	UME	PAM			1	1	1	1		1	1	1
12	UJ/2016/EN/0098	HH	UME	PAM			1	1	1	1	1	1	1	1
13	UJ/2016/EN/0018	HJ	UME	PAM			1	1	1	1	1	1	1	1
14	UJ/2018/EN/0071	HY	UME	PAM			1	1	1	1	1		1	1
15	UJ/2018/EN/0073	GH	UME	PAM			1	1	1	1			1	1
16	UJ/2018/EN/0075	EJEBA ang	UME	PAM			1	1	1	1			1	1

Fig 2. Registration to be uploaded

2.1   Emailing Course Registration

This function is used to send the validated course registration shown in Fig. 3, to the student in a format depicted in Fig. 4. All the valid registration and the invalid ones will be mailed to the student, with explanation (reason) for any course that is drop down. All pending course(s) yet to pass or register will also be mailed to the student. The student will also be informed whether the approved (valid) credit unit is below the minimum or above the maximum permissible credit load. To mail the registration of just one student, Individual Result/Registration radio button should be checked, with the matric number of the student on the matric edit textbox. While to mail all the students registration to their respective institution emails, Level Course/Registration radio button should be checked. This piece of information is very important as it served as a guide to the students as per which course(s) to add in case of under registration and the ones to drop in situation of over registration. It also prepare the student about the courses he/she is eligible to write their exams as only courses the student has valid registration will be credited to them. This tool advised the students in a proactive way about their pending courses at the beginning of the session after registration instead of waiting till the end of the session when results were released which is the current practice in University of Jos. In University of Jos, students only know their pending courses at the end of each session when the sessional results were released. This left the students with the only option of registering pending courses in the following

UINIVERSITY OF JOS								EEE	EEE	EEE	EEE	EEE	EEE	EEE	EEE
FACULTY OF ENGINEERING															
DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING															
500 B.ENG ELECTRICAL AND ELECTRONIC ENGINEERING 2023/2024 SESSION															
S/N	MAT.NO	NAME	ME	OPTION	Remark	TCR		501	503	505	507	509	511	401	403
								3	3	2	2	2	2	2	2
1	UJ/2015/EN/0120	DZUNGWE Terence Aondongu	UME	CE	REG: CHM101, EEE302, EEE403, EEE501, EEE503,	12		0	0	1	1	1	1	1	0
2	UJ/2015/EN/0009	IBRAHIM Muhammed Awwal	UME	PAM		14		1	1	1	1	1	1	P	P
3	UJ/2015/EN/0118	BAGU Dorcas Nenadi	UME	CE		14		1	1	1	1	1	1	P	P
4	UJ/2015/EN/0023	JOHN Ayuba Pam	UME	ECE		14		1	1	1	1	1	1	P	
5	UJ/2014/EN/0001	SAMUEL Oluwatimilehin Emmar	UME	CE	REG: CHM106, MTH201, MTH202, MTH341, MTH342	14		1	1	1	1	1	1	P	
6	UJ/2014/EN/0086	SHUAIBU Ibrahim Muhammed	UME	CE		14		1	1	1	1	1	1	P	
7	UJ/2019/EN/0141	OKWUJIA Victor Oyare	UME	CE		14		1	1	1	1	1	1	P	
8	UJ/2019/EN/0164	NWAFOR Rejoice Chinasa	UME	CE	REG: MTH202, MTH342,	14		1	1	1	1	1	1	P	
9	UJ/2019/EN/0236	FOLORUNSHO Enoch Oluwadam	UME	PAM	REG: CHM105, EEE305,	14		1	1	1	1	1	1	P	
10	UJ/2018/EN/0045	FRANCIS Wisdom	UME	PAM		20		1	1	1	1	1	1	P	
11	UJ/2016/EN/0223	EWUGA Bathsheba Ashezi	UME	PAM	REG: EEE211, EEE407,	14		1	1	1	1	1	1	P	
12	UJ/2016/EN/0098	IKWUOCHE Ogbene Blessing	UME	PAM		14		1	1	1	1	1	1	P	
13	UJ/2016/EN/0018	PAM Dorcas Chuhwak	UME	PAM		14		1	1	1	1	1	1	P	P
14	UJ/2018/EN/0071	BULUS Nanpyal Gwakbong	UME	PAM	REG: CHM103, EEE203, MTH201, MTH202, MTH341,	13		1	0	1	1	1	1	P	1

Fig. 3: Validated Registration

Name: Great Man
Matric: UJ/XXXX
Option: CE
Session: 2023/2024
Level: 500
Total Credits Register: 19
REG: MTH201, MTH202, MTH341, MTH342, EEE403, EEE503,

Registration Status Interpretation:
1:    Valid Registration
0:    Invalid Registration due to Pending Prerequisite
P: Invalid Registration. You have Passed the Course

S/N	Course Code	Credit Unit	Registration Status
1	EEE501	3	1
2	EEE503	3	0
3	EEE505	2	1
4	EEE507	2	1
5	EEE509	2	1
6	EEE511	2	1
7	EEE401	2	P
8	EEE403	2	0
9	EEE303	2	1
10	EEE201	2	P
11	EEE202	3	P
12	EEE513	3	1
13	MTH103	3	1

Fig. 4: Mailed Registration

3. RESULTS PRESENTATION AND DISSEMINATION

The senate format results for all the levels were prepared by this tool as shown in Fig. 5. These senate format results were saved in a database for each department such that the result of any student for any session is automatically prepared by the toolkit on completion of the required information on the main GUI, and selection of the required function. Instead of manual searching of workbooks for preparation of requested results, everything is now automated and generated at a click of a button. In order to meet up with the request of different individuals (students, employers, funding bodies, etc.) demanding for results, the tool incorporated four schemes of results presentation and dissemination. This is essential to cover both demands for hardcopy and softcopy (electronic copy) of results. Three of these schemes are presented in this paper, these are:

UINIVERSITY OF JOS																		
FACULTY OF ENGINEERING																		
DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING																		
100 B.ENG ELECTRICAL AND ELECTRONIC ENGINEERING 2019/2020 SESSION																		
S/N	MAT.NO	NAME	ME	MNSA	NSS	100 Level Summary					CHM 101	GP	CHM 103	GP	CHM 105	GP	CHM 106	GP
						TCR	TCE	TGP	GPA	Remark	3		1		3		1	
1	UJ/2015/EN/019	CF	UME	15	2	14	11	34	2.43	RPT: CHM101,	43	0	60	4	50	3	50	3
2	UJ/2015/EN/0999	GH	UME	15	2	14	14	46	3.29	PASS	68	4	80	5	55	3	45	2
3	UJ/2015/EN/0118	DD	UME	15	2	14	14	49	3.5	PASS	55	3	60	4	70	5	55	3
4	UJ/2015/EN/0023	GH	UME	15	2	14	14	63	4.5	PASS	67	4	45	2	88	5	60	4
5	UJ/2014/EN/0001	JK	UME	15	2	14	13	48	3.43	RPT: CHM106,	58	3	55	3	45	2	33	0
6	UJ/2014/EN/0086	KL	UME	15	2	14	14	52	3.71	PASS	45	2	66	4	77	5	56	3
7	UJ/2019/EN/0141	KL	UME	15	2	14	14	41	2.93	PASS	68	4	45	2	45	2	55	3
8	UJ/2019/EN/0164	KP	UME	15	2	14	14	58	4.14	PASS	66	4	45	2	66	4	46	2
14	UJ/2018/EN/XX71	OK	UME	15	2	14	7	15	1.07	Probation, RPT: CHM103, MTH101	45	2	33	0	45	2	58	3
15	UJ/2018/EN/0073	XX	UME	15	2	8	5	19	2.38	RPT: CHM105,	68	4	45	2	34	0	77	5
16	UJ/2018/EN/0075	PP	UME	15	2	14	14	60	4.29	PASS	50	3	54	3	78	5	50	3
17	UJ/2018/EN/0084	XC	UME	15	2	14	14	62	4.43	PASS	60	4	48	2	89	5	55	3
18	UJ/2018/EN/0087	CV	UME	15	2	14	11	39	2.79	RPT: CHM105,	70	5	45	2	43	0	60	4

Fig. 5: Senate Format Result

3.1. First/Second Semester Result

This function is used to prepare semester or sessional result of a student and present the result in a spreadsheet as shown in Fig. 6. The result will include the Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) where applicable. If this function is executed when only first semester results have been uploaded, only first semester result will be displayed but if it is executed when both first and second semester results have been uploaded, the entire sessional result will be presented. This can be printed and the hardcopy given or sent to the authorized requesting body or student. This takes care of hardcopy demand. Since the result is not manually prepared, there is good time management, and devoid of human typing errors.

Name	IBRAHIM Enoch Moses				
Matric	UJ/2018/EN/0015				
Session	2023/2024				
Level	500				
S/N	Course	Score	Point	Grade	Remark
1	EEE501	45	2	D	Pass
2	EEE503	45	2	D	Pass
3	EEE505	45	2	D	Pass
4	EEE507	80	5	A	Pass
5	EEE509	60	4	B	Pass
6	EEE511	68	4	B	Pass
GPA	3				
CGPA	3.1				

Fig. 6: Spreadsheet Result

3.2. Retrieve Course Result

This is used to retrieve the result of a particular course for a given session. If Level Result/Registration radio button is checked, it will present a spreadsheet copy of the result submitted by the course lecturer. If Individual Result/Registration radio button is checked, an additional information will be required i.e. the matric number of the individual student and the course code of the course. The result of the student for that particular course will be displayed in a message box as shown in Fig. 7. But if the student did not have score in that course, none will be assigned to the score. This function is very useful in a situation where a student want to know or verify their scores in a particular course for a given session.
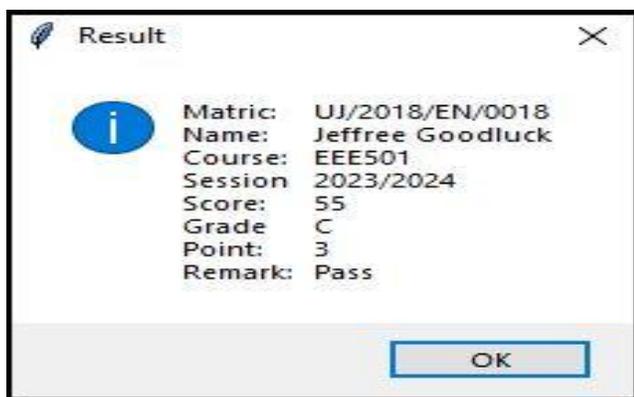

Fig. 7: Course Result

3.3. Email Result

This is use to send the result to the students' institution or University emails. Since the students University emails are related to their matric number, the software automatically obtain the students University email address from their matric numbers. Hence no need of providing the students' email address. This function is similar to First/Second Semester Result function depicted in Section 3.1, the only distinction is that the result will be sent to the student email in the format shown in Fig. 8 and 9. If Individual Result/Registration radio button is checked, the result of only the student whose matric number is specify will be sent to him/her. But if Level Result/Registration radio button is checked, the results of all the students of that level will be mailed to their respective email address. If the email is sent successfully, it will display a message on the terminal: Sent To: (Student details) otherwise it will print: Not sent To: (student details).

Name:	Good Citizen
Matric:	UJ/XXXXX
Session:	2019/2020
Level:	100
GPA:	3.21

S/N	Course	Score	Point	Grade	Remark
1	CHM101	70	5	A	Pass
2	CHM103	45	2	D	Pass
3	CHM105	43	0	F	Fail
4	CHM106	60	4	B	Pass
5	MTH101	56	3	C	Pass
6	MTH102	70	5	A	Pass

Fig. 8: Email Result

Name:	Brilliant Future
Matric:	UJ/XXXX
Session:	2023/2024
Level:	500
GPA:	3.57
CGPA:	3.76

S/N	Course	Score	Point	Grade	Remark
1	EEE501	45	2	D	Pass
2	EEE503	66	4	B	Pass
3	EEE505	66	4	B	Pass
4	EEE507	66	4	B	Pass
5	EEE509	66	4	B	Pass
6	EEE511	60	4	B	Pass

Fig. 9: Email Result

4. CONCLUSION

A robust standalone user friendly result computation and academic record management system was developed. This tool incorporated effective framework for results preparation and dissemination. Further work will include functions for moderation and academic transcript preparation.

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Sunday Iliya, Chollom Teng and Kishak Zakka Cinfwat (2022), A Note on User Friendly Academic Result Delivery Toolkit

7