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Sustainable Quality Assurance:

Optimizing Synergies between Artificial and Human Intelligence

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Session 3

Students' Dropout Solution using smart AI: Exploring Unique Way for the Retention of Prospective Student

Team Presentation

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Daffodil International University

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Daffodil International University

What is dropout?

Dropout students are defined as who leave the specified level without completing their study period.

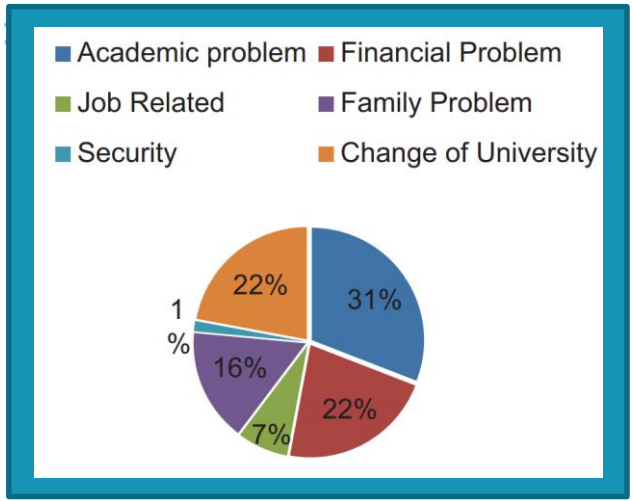
Fresher Students

Reasons of Dropout

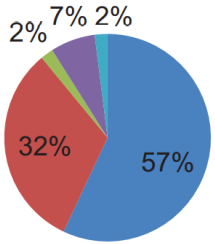
Dropout Students

- Burden for a family.
- Burden for a nation.
- Economic Impact at educational sectors.

What are the reasons of student dropouts?

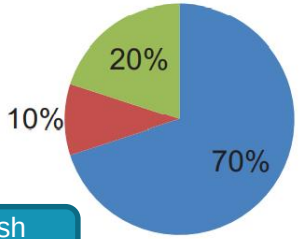


Academic



- Pressure of Study
- Weak in English
- Could not Adjust
- Failed in Course(s)
- Credit not accepted

Financial



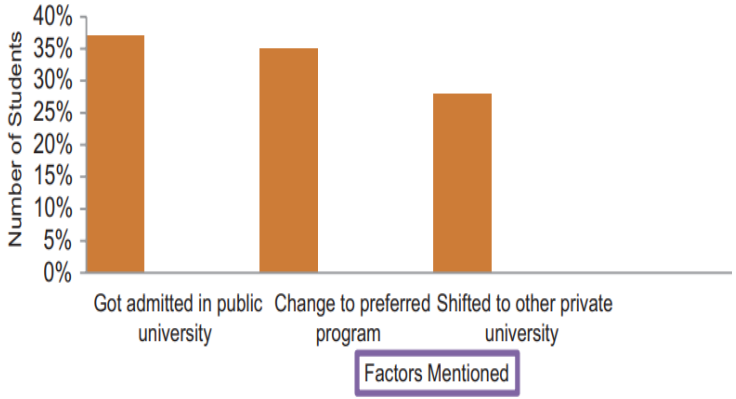
- Financial Crisis after Admission 70%
- Cancel of Waiver 10%
- High dues 20%

Port City International University, Chittagong, Bangladesh
Case Study result

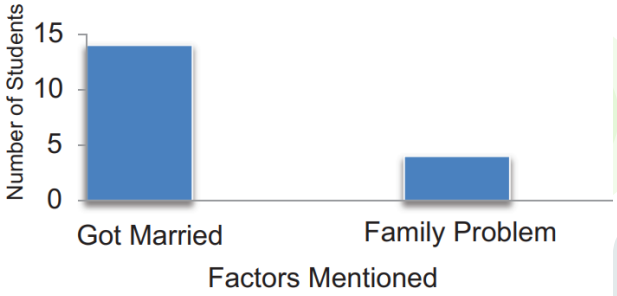
Source: Factors Influencing on Dropouts at Undergraduate Level in Private Universities of Bangladesh: A Case Study Australasian Journal of Business, Social Science and Information Technology (AJBSSIT)- 2018

What are the reasons of student dropouts?

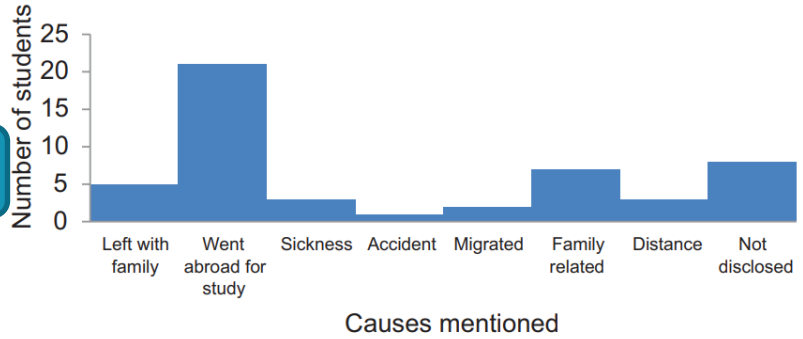
Change of University



Family related



Others

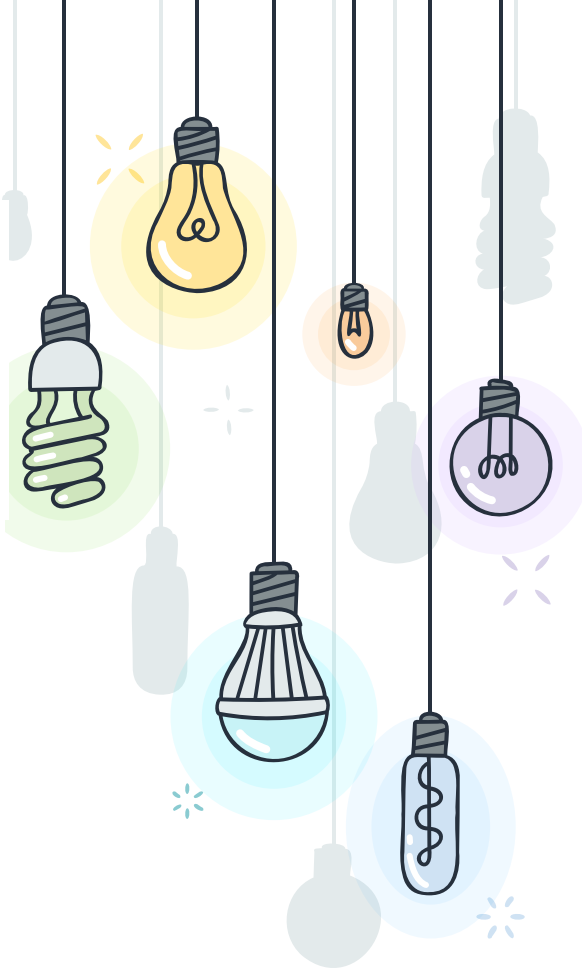


Port City International University, Chittagong, Bangladesh
Case Study result

Source: Factors Influencing on Dropouts at Undergraduate Level in Private Universities of Bangladesh: A Case Study
Australasian Journal of Business, Social Science and Information Technology (AJBSSIT)- 2018

What are the reasons of student dropouts?

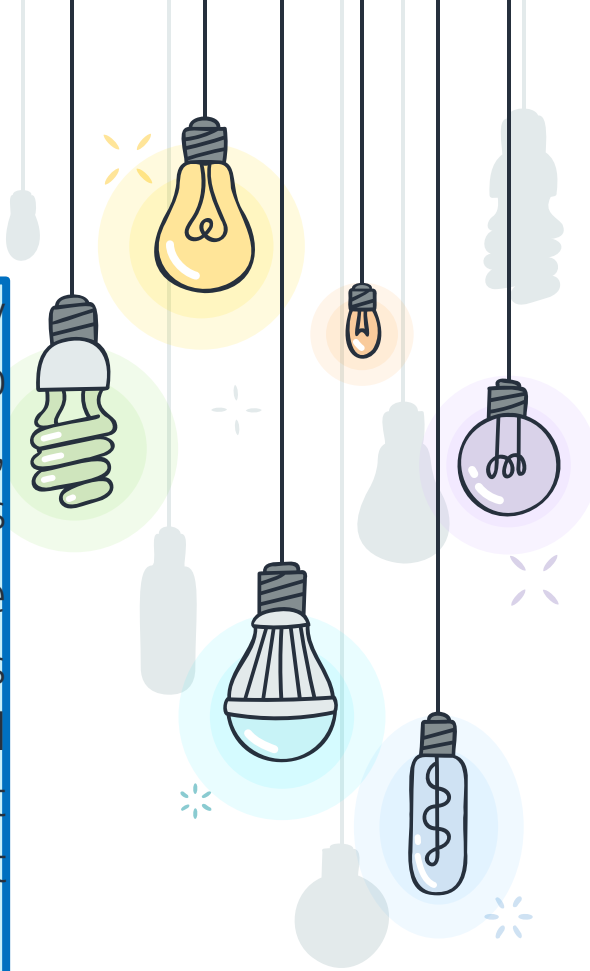
Reasons for dropout up to graduation	Zambia (%)	Bangladesh (%)	Nepal (%)	Uganda(%)
Lack of money	55.3	61.9	14.9	4.8
Family problem	14.4	11.5	24.1	6.8
Difficulties with school work	0	3.5	0	0.8
Expelled from school	0.5	0.9	0	0.8
Earning money	0	2.7	13.8	0.8
Needed to work at home	0	5.3	13.7	0.8
Illness	2.9	3.5	4.6	9.8
Marriage	1	0	8	7.5
Pregnancy	1.9	0	0	9.8
Death in the family	1	0.9	1.1	2.3
Failed in a grade and have to repeat	11.5	2.7	4.6	1.5
Think old to go to school	0	0	1.1	1.5
Finishing the chapter at secondary	3.4	0	5.7	4.5
Transfer	0	0	0	0.8
Withdrawn by parent/ guardian	0	0	3.4	0.8
Total dropout	91.9	92.9	95	96.6



Source: Dropout at Tertiary Education in Bangladesh: Configurations and Determinants. Feni University Journal, No. 01, Vol.01, August 2016

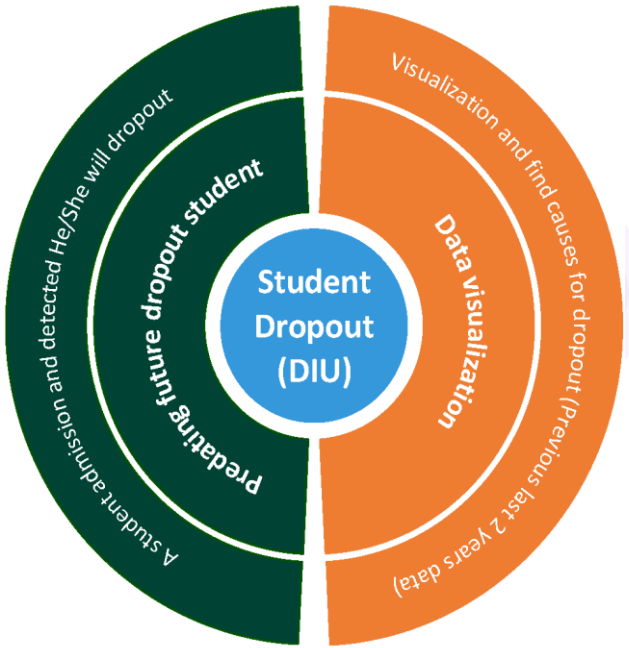
The Project: Students' Dropout Solution

Students' dropout solution is a unique tools, being used by faculty members of Daffodil International University (DIU) to check the status of each student regarding the overall scenario, using different parameters and employing sentiment analysis as well. It's an Artificial Intelligence (AI) operated module designed to evaluate the dropout tendencies among students and has been using to find out the real reason which will facilitate concerned faculty members to take right and correct measures, accordingly and paves the way for improvement against challenges.



The Project: Students' Dropout Solution

- Determine the probability of dropping out
- Working toward a real-time snapshot of a student's dropout risk
- Data Visualization in Web Application & Mobile App
- Live data integration from Educational ERP by API
- Facilitate to achieve better reputation by minimizing students dropout
- Generate more revenue by minimizing student's dropout
- Help to develop students' future career by minimizing students dropout
- Facilitate to deliver smart and latest services.
- Starting the journey with descriptive analytics
    - Helping boost graduation rates by minimizing Dropout
    - Intervening early to get students moving in the right direction
    - Sharing the model with other districts
    - Turning a vision into reality
- Data Management and Analytics
- Dashboards for Whole Scenario, Faculties, Departments, Semesters, Individual Students



DIU DROPOUT SYSTEM

Training Data

Train with
Machine Learning
Algorithms

Evaluate

Model

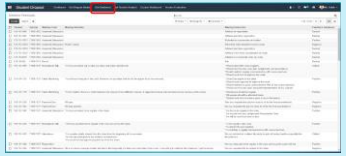
Data From
ERP and Mentoring System

DIU Dropout System
Data Analysis & find the dropout reasons
With Sensitive Analysis Feature

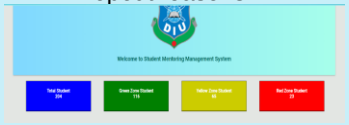
Prediction

Dropout System Frontend Features

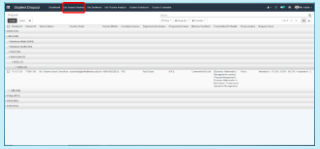
Data Visualization with
Dropout reasons



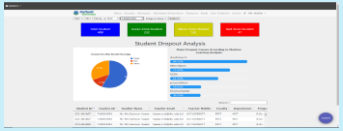
Sentiment Analysis



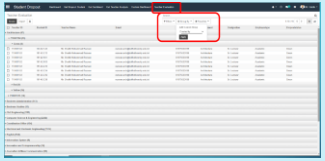
Mentoring System



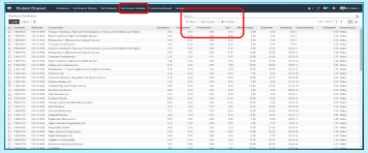
Individual student analysis



Faculty & Dept. wise Dashboard

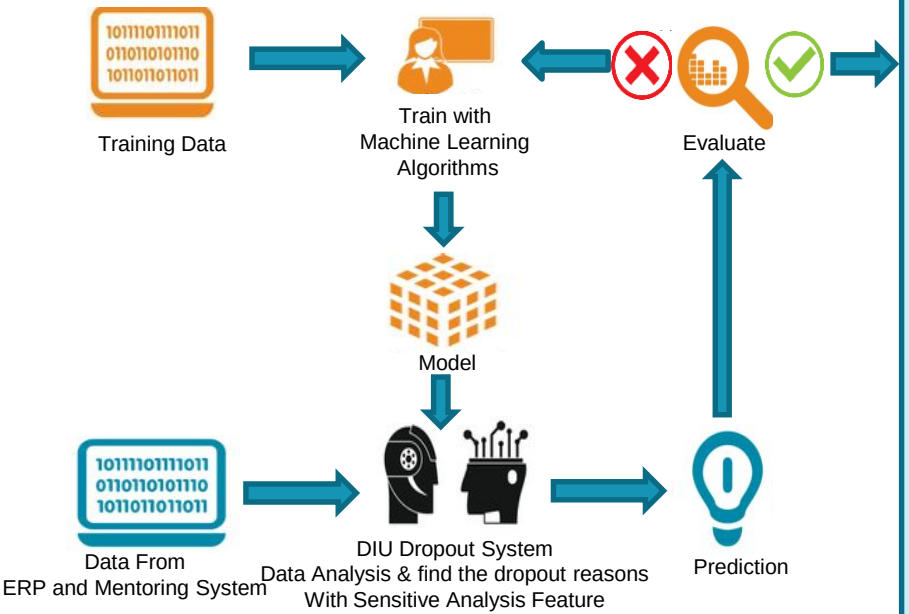


Teachers Evaluation



Teacher & Course wise Dropout Info

DIU BENEFITS

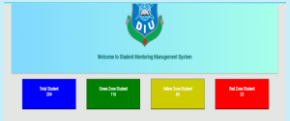


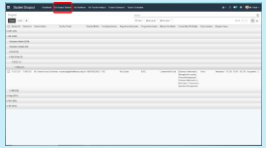
University can get following benefits

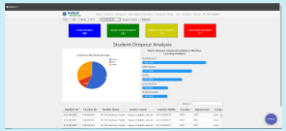
Dropout System Frontend Features

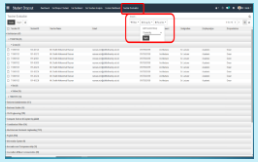
Data Visualization with Dropout reasons

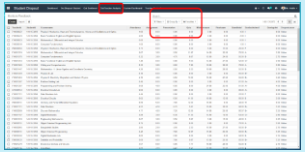
Sentiment Analysis


Mentoring System


Individual student analysis


Faculty & Dept. wise Dashboard


Teachers Evaluation


Teacher & Course wise Dropout Info

- Revenue Projection
- Waiver Distribution
- Faculty & Dept. Monitoring/ Development
- Mentors Performance analysis
- Teachers Performance analysis
- Students Performance analysis
- Admission & Students Affairs road map projection
- Decision making for Infrastructure Development
- R&D for the Education Sectors

Parameters consideration

Independent Parameters used for training the model

Faculty
Department
ATTENDANCE
QUIZ
MID_TERM
GRADE_OBTAINED
COURSE_ID
ATTENDANCEPERCENTAGE
MENTORS_FEEDBACK
SEX
RELIGION
SSC_CGPA
HSC_CGPA
MARITAL_STATUS
FATHERANNUALINCOME
MOTHERANNUALINCOME
LOCALGUARDIANRELATION
BEAR_EDU_EXPENSE
ENROLLMENT_AGE
PRE_ADDRESS
SGPA
CREDIT
PAYABLE
PAID
DUE

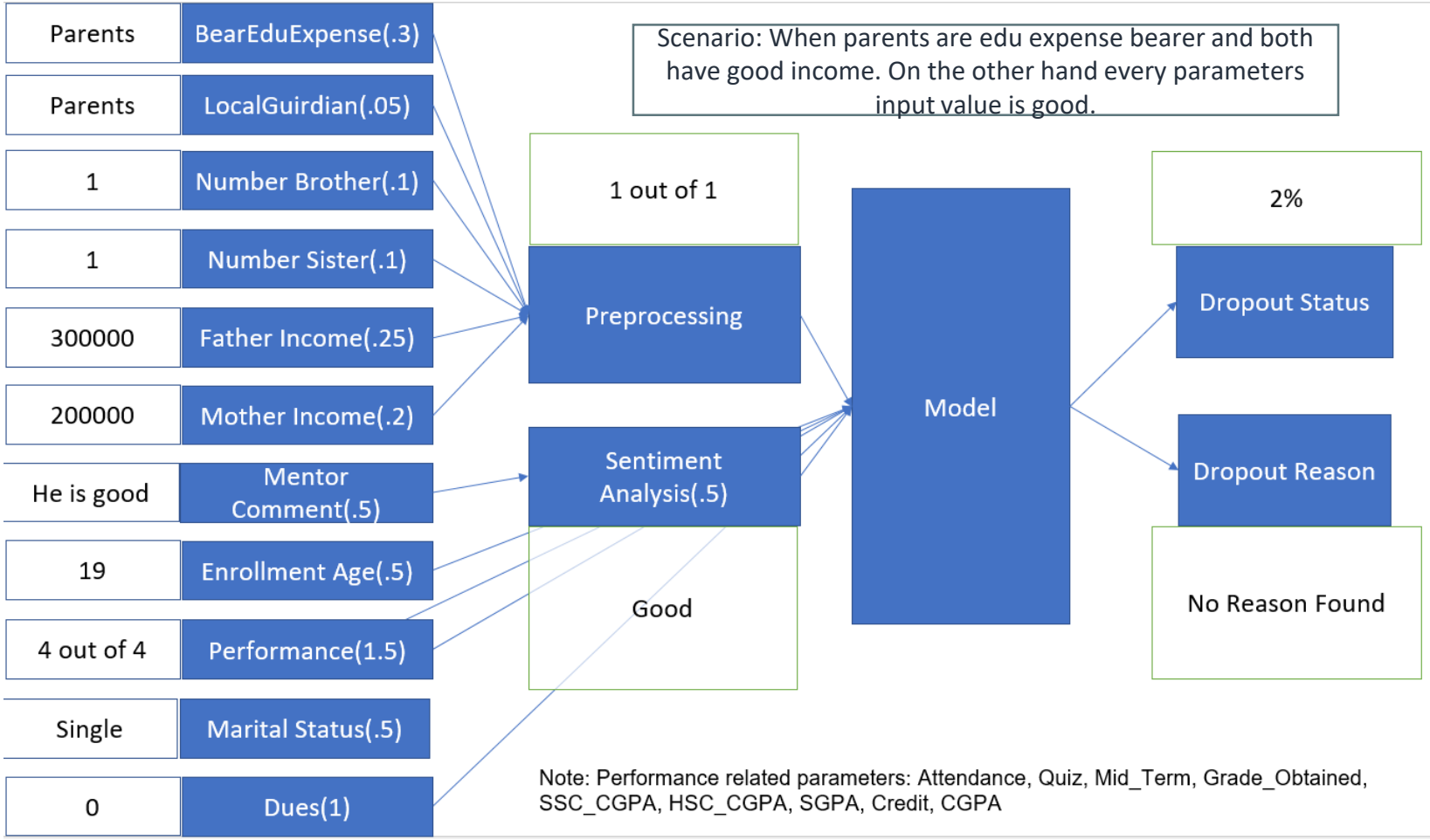
Parameters used for visualize

CAMPUS_NAME
BATCH_ID
PROGRAM_NAME
PROG_SHORT_NAME
DEPT_SHORT_NAME
DEPARTMENT_NAME
FACULTY_NAME
FAC_SHORT_NAME
SEMESTER_ID
SEMESTER_NAME
PRESENT_HOUSE
PRESENT_CITY:
PRESENT_DISTRICT:
PERMANENT_HOUSE:
PERMANENT_CITY
PERMANENT_DISTRICT
STUDENT_ID
Dropout Reason
Dropout Status
NAME

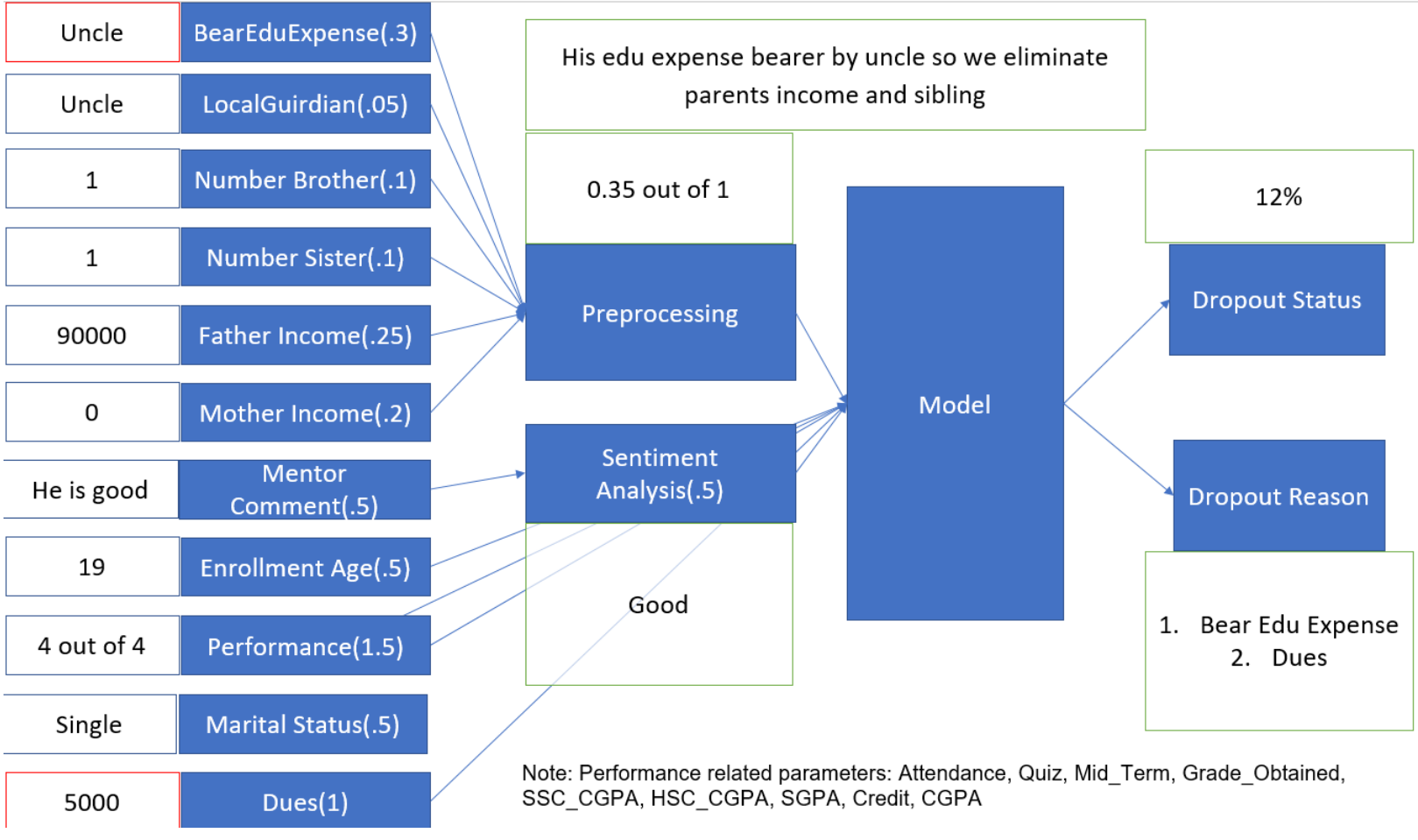
Dependent parameter/Target Variable

Dropout Reason
Dropout Status

Some scenarios with Parameters

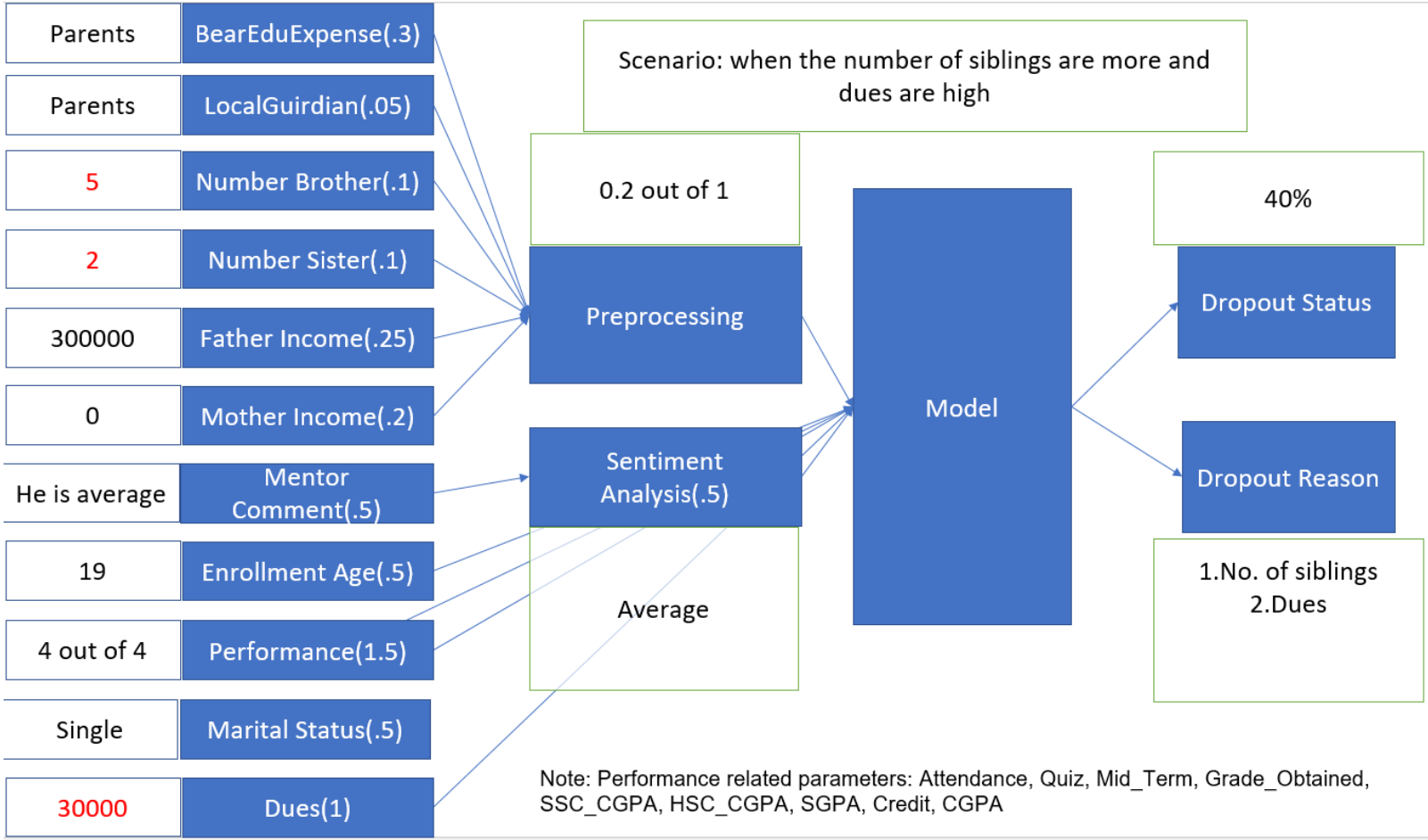


Some scenarios with Parameters

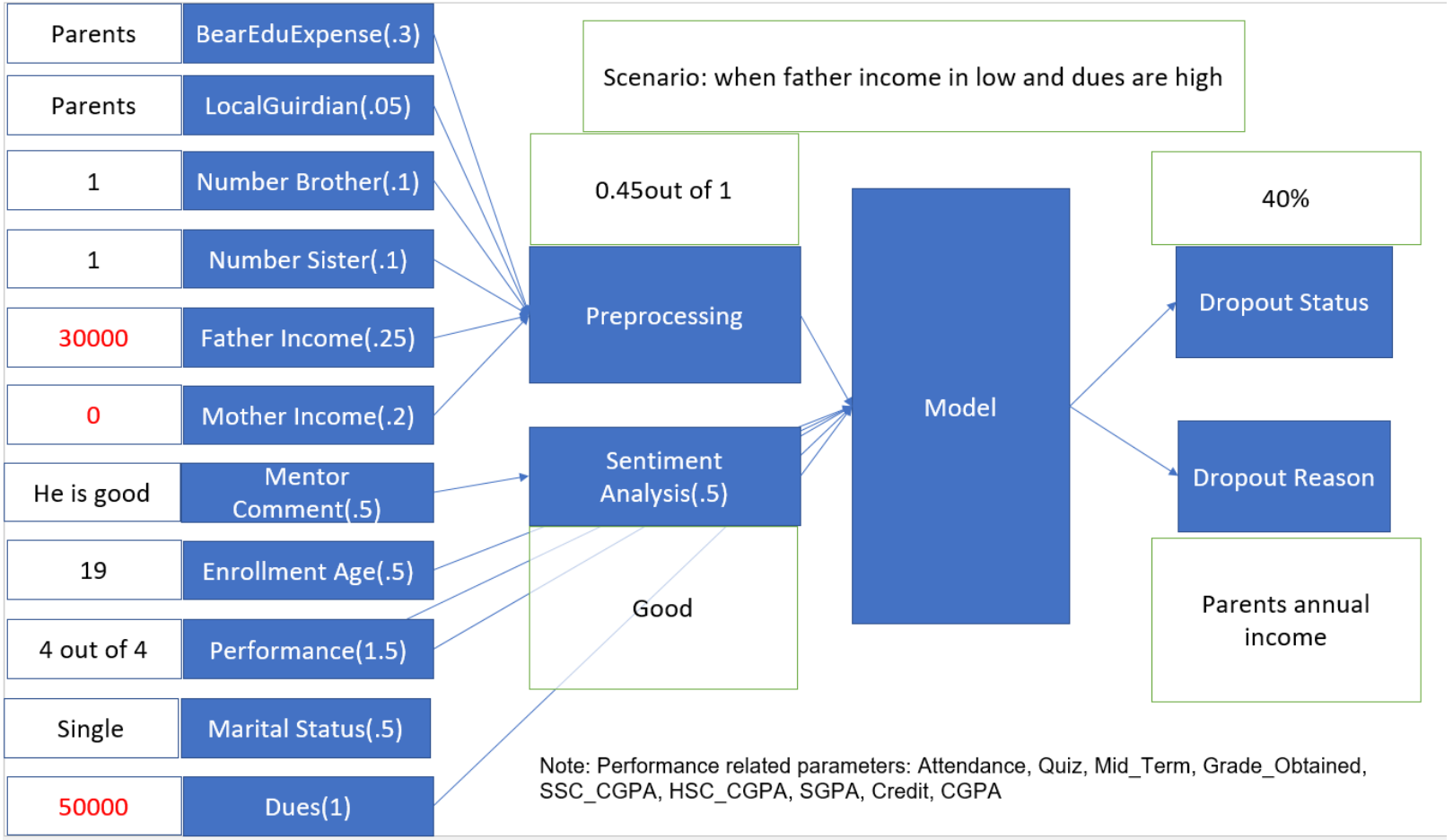


Note: Performance related parameters: Attendance, Quiz, Mid_Term, Grade_Obtained, SSC_CGPA, HSC_CGPA, SGPA, Credit, CGPA

Some scenarios with Parameters



Some scenarios with Parameters



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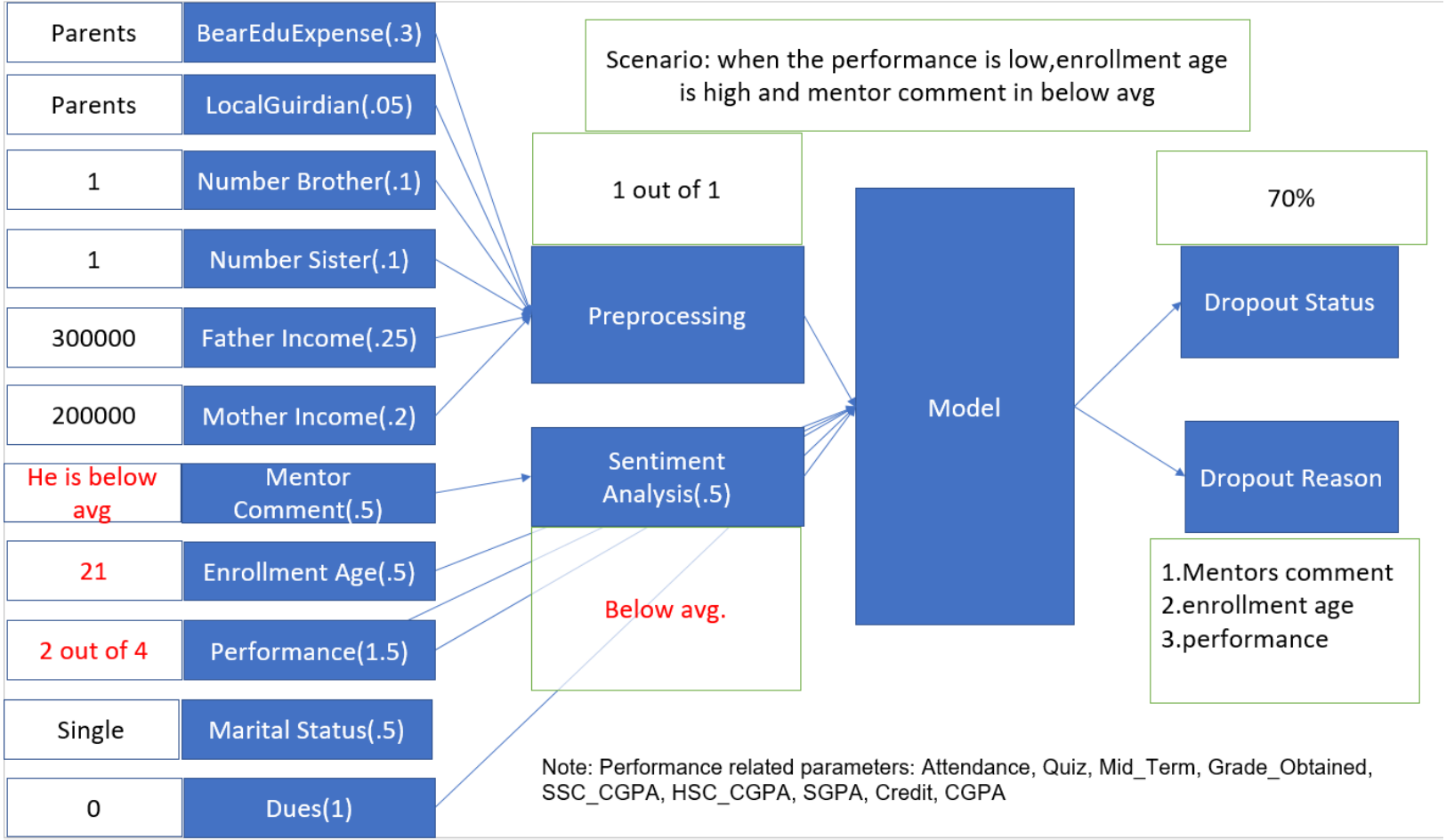
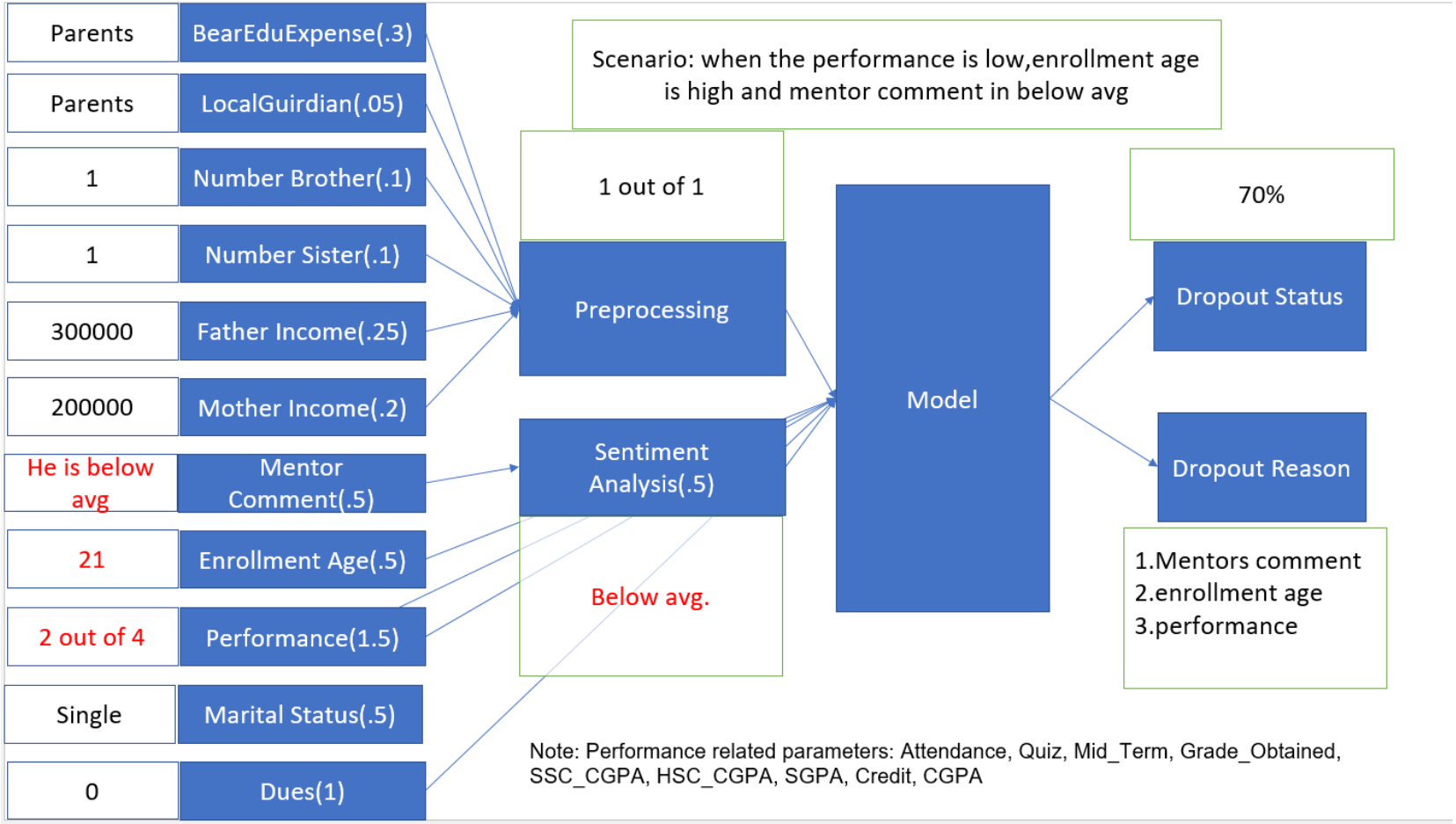


Some scenarios with Parameters



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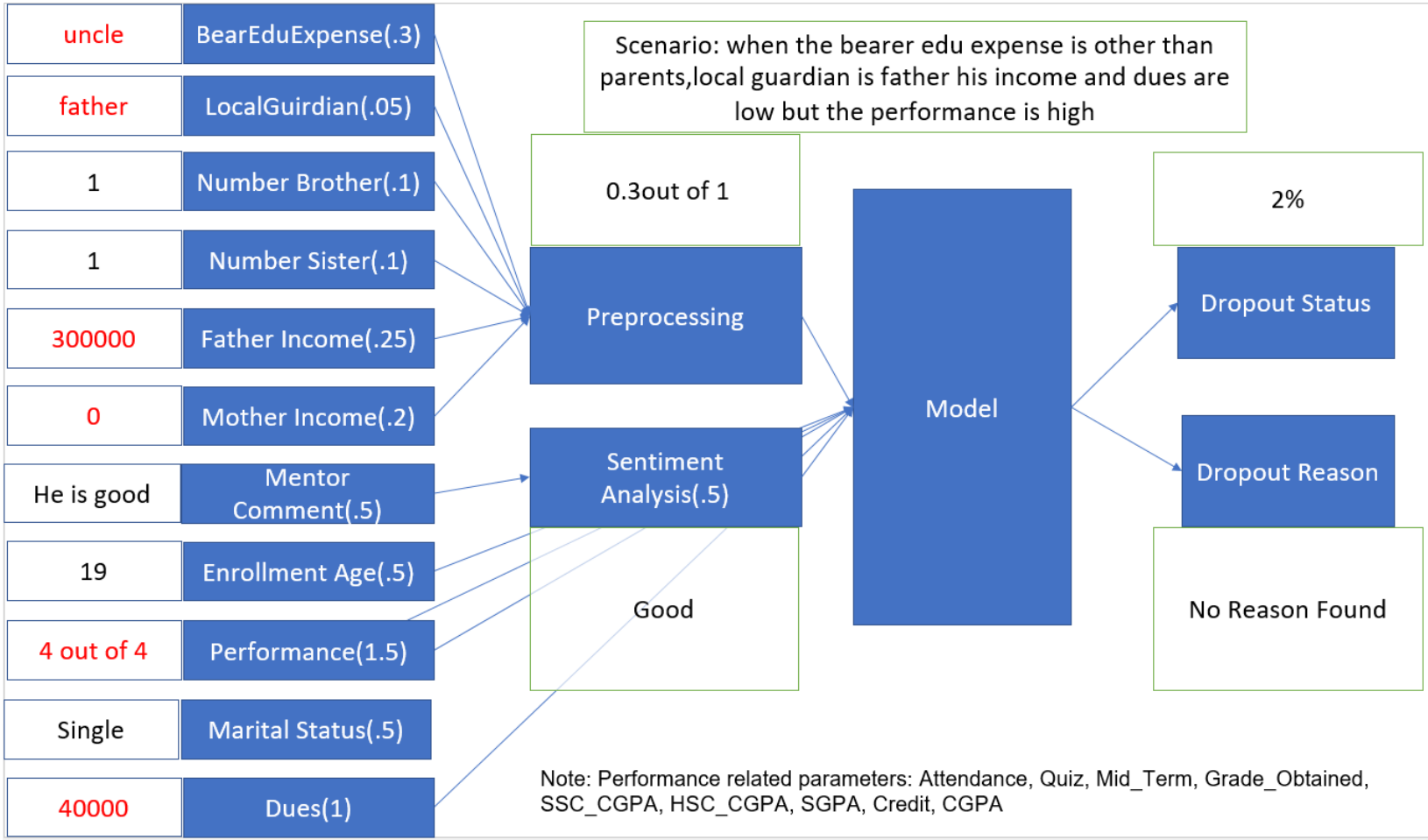
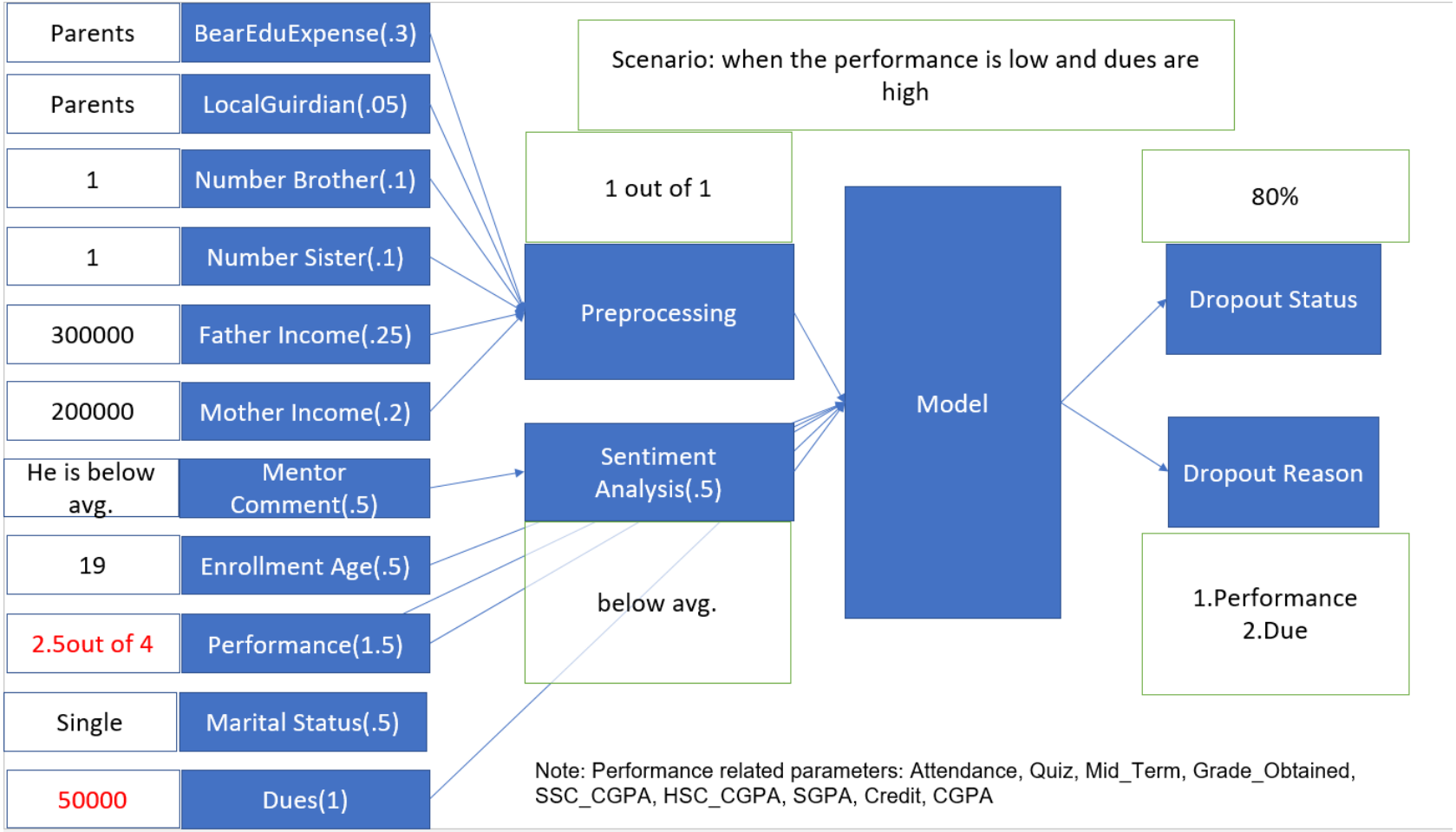
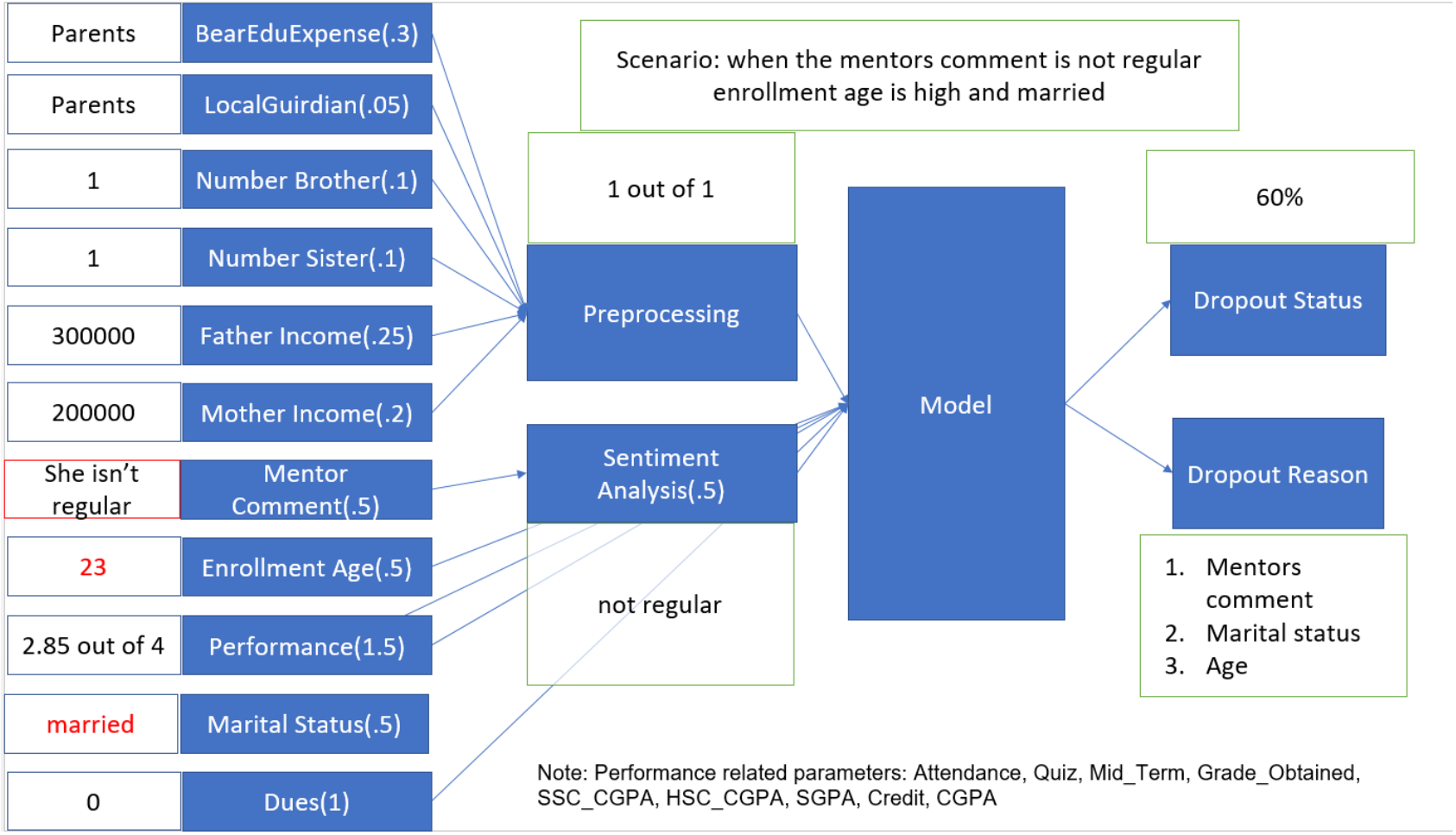


Some scenarios with Parameters

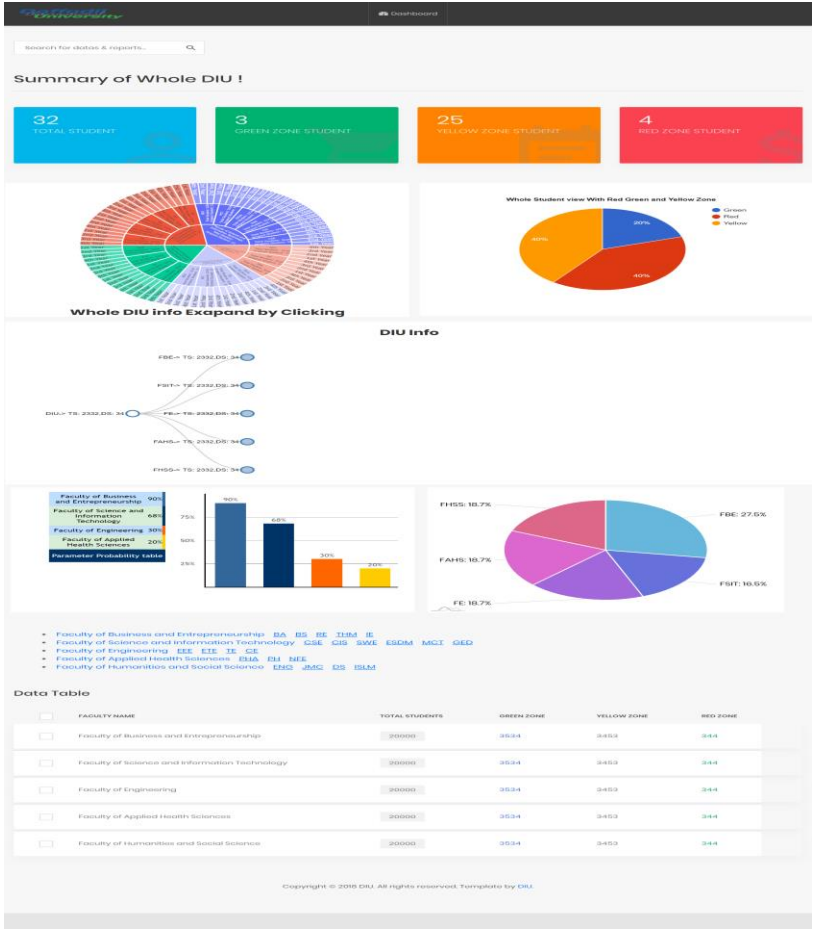


Some scenarios with Parameters



The interface

Dashboard


Dashboard
Search for datas & reports...
Summary of Whole DIU !
32
TOTAL STUDENT
3
GREEN ZONE STUDENT
25
YELLOW ZONE STUDENT
4
RED ZONE STUDENT
Whole DIU info Exapand by Clicking
Whole Student view With Red Green and Yellow Zone
Green
Red
Yellow
20%
40%
40%
DIU Info
Faculty of Business and Entrepreneurship 90%
Faculty of Science and Information Technology 68%
Faculty of Engineering 30%
Faculty of Applied Health Sciences 20%
Parameter Probability table
90%
68%
30%
20%
75%
50%
25%
FHSS: 18.7%
FBE: 27.5%
FAHS: 18.7%
FSIT: 16.5%
FE: 18.7%
Faculty of Business and Entrepreneurship BA BS RE THM IE
Faculty of Science and Information Technology CSE CIS SWE EEDM MCT GED
Faculty of Engineering EEE ETE TE CE
Faculty of Applied Health Sciences PBA PH NFE
Faculty of Humanities and Social Science ENG JMC DS ISLM
Data Table
FACULTY NAME
TOTAL STUDENTS
GREEN ZONE
YELLOW ZONE
RED ZONE
Faculty of Business and Entrepreneurship 20000 3534 3453 344
Faculty of Science and Information Technology 20000 3534 3453 344
Faculty of Engineering 20000 3534 3453 344
Faculty of Applied Health Sciences 20000 3534 3453 344
Faculty of Humanities and Social Science 20000 3534 3453 344
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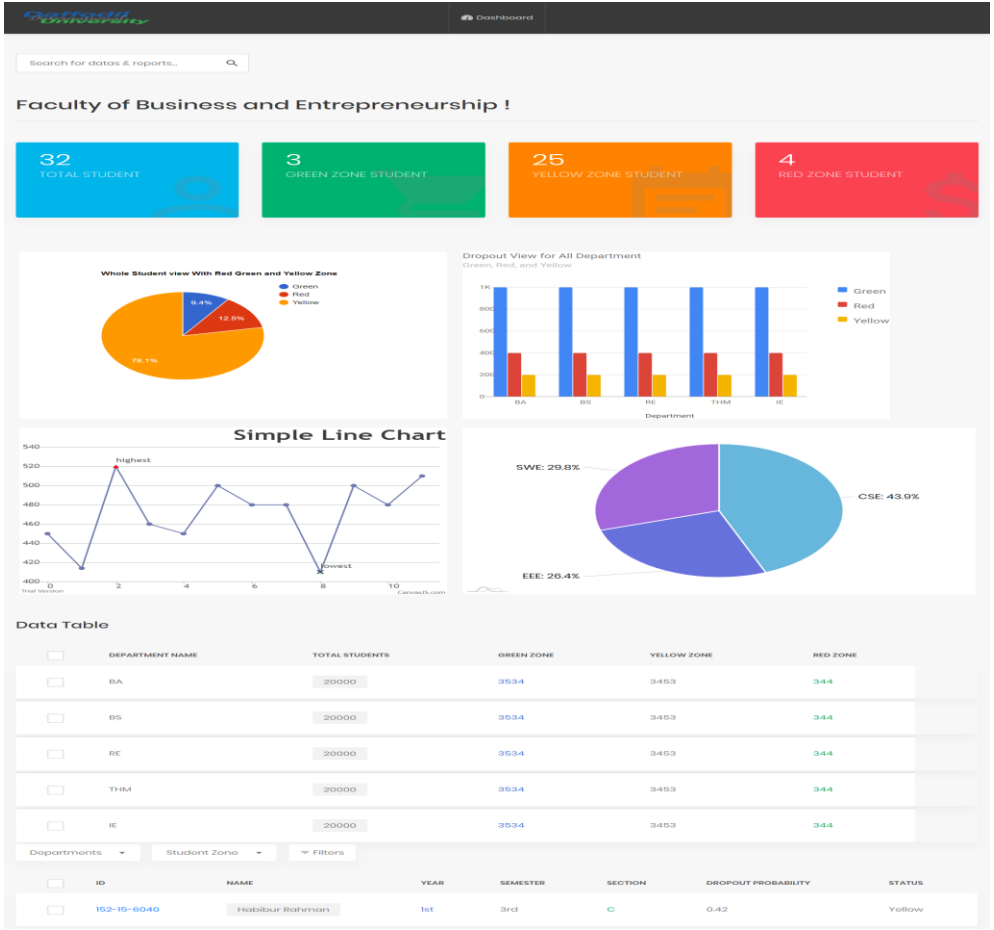
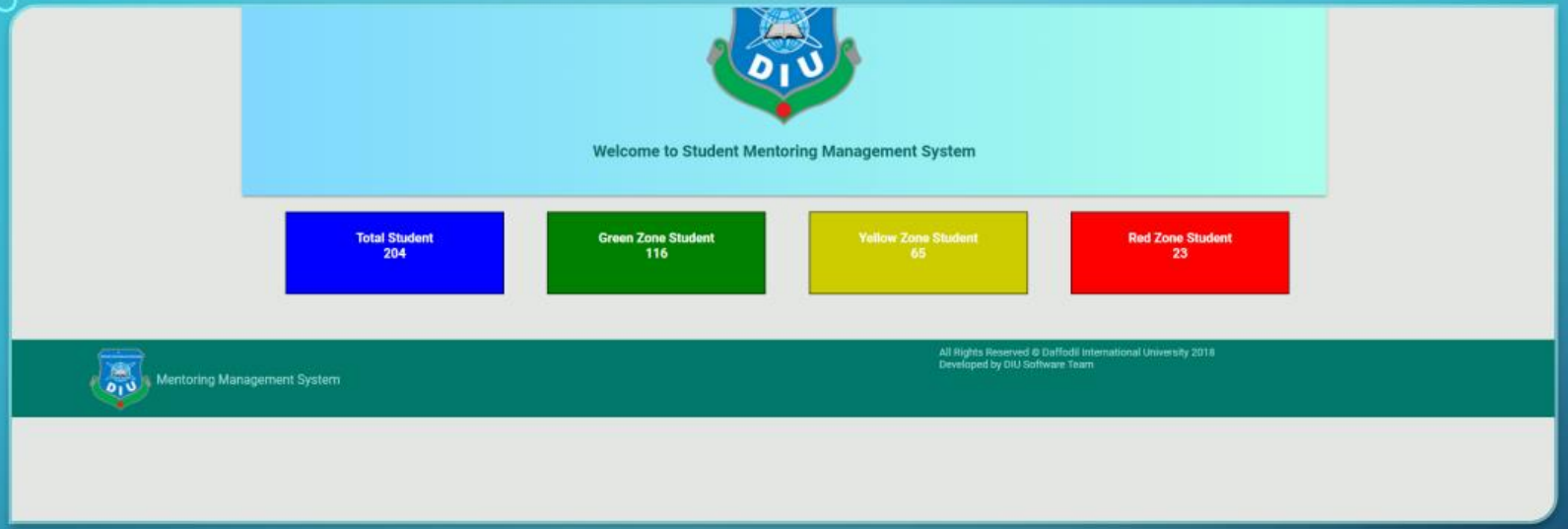
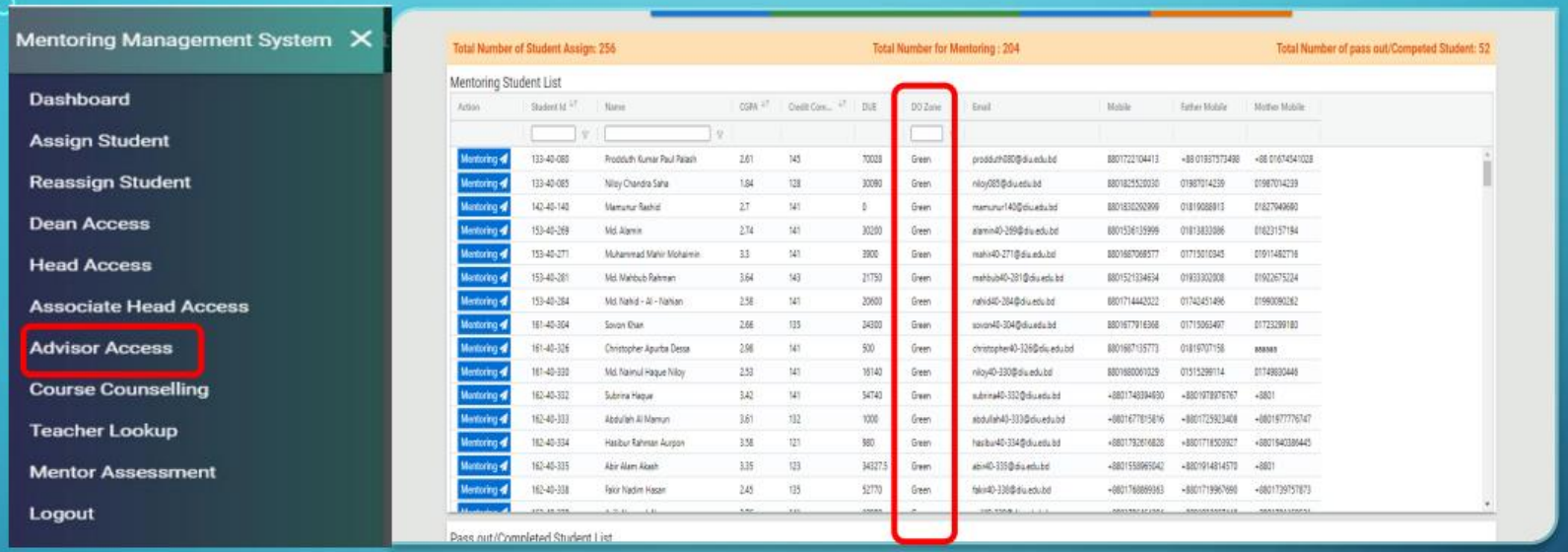

Dashboard
Search for datas & reports...
Faculty of Business and Entrepreneurship !
32
TOTAL STUDENT
3
GREEN ZONE STUDENT
25
YELLOW ZONE STUDENT
4
RED ZONE STUDENT
Whole Student view With Red Green and Yellow Zone
Green
Red
Yellow
9.4%
12.5%
78.1%
Dropout View for All Department
Green, Red, and Yellow
Green
Red
Yellow
BA
BS
RE
THM
IE
Department
Simple Line Chart
highest
lowest
Trial Version
CanvasJS.com
SWE: 29.8%
CSE: 43.9%
EEE: 26.4%
Data Table
DEPARTMENT NAME
TOTAL STUDENTS
GREEN ZONE
YELLOW ZONE
RED ZONE
BA 20000 3534 3453 344
BS 20000 3534 3453 344
RE 20000 3534 3453 344
THM 20000 3534 3453 344
IE 20000 3534 3453 344
Departments
Student Zone
Filters
ID
NAME
YEAR
SEMESTER
SECTION
DROPOUT PROBABILITY
STATUS
152-15-6040 Habibur Rahman 1st 3rd C 0.42 Yellow



MENTORING SYSTEM DASHBOARD

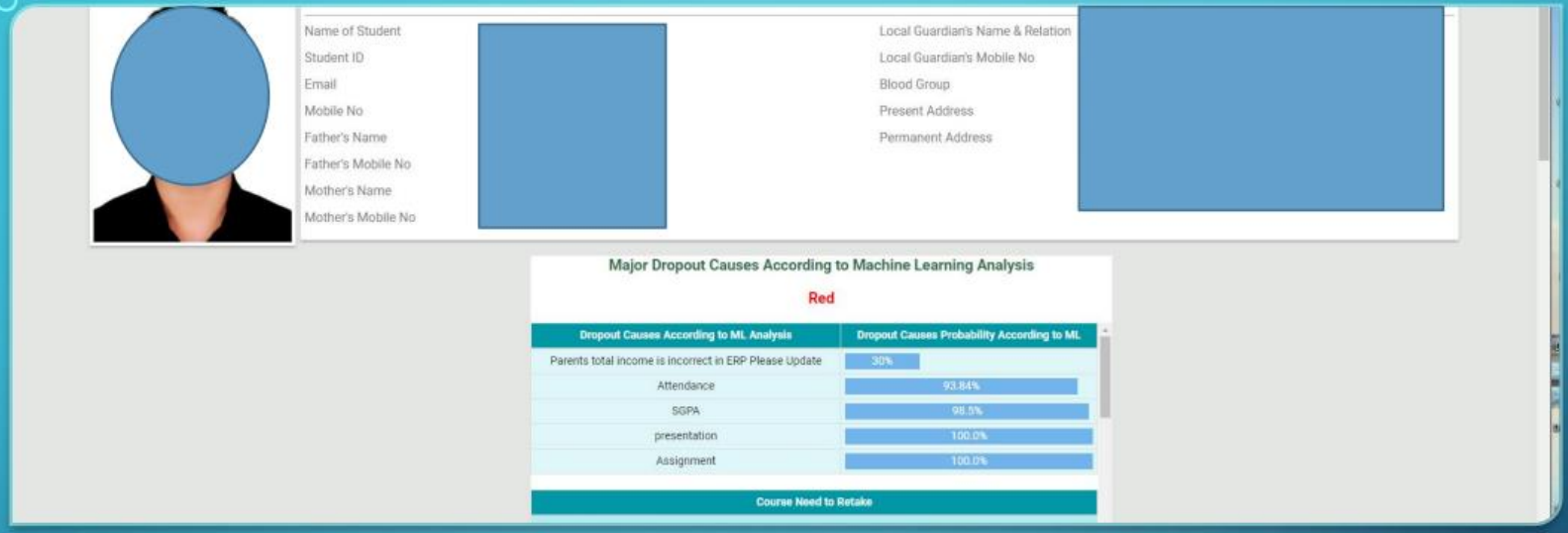
Click this URL http://software.diu.edu.bd/mentoring this will redirect you to the login page. After you login above mentioned page will open. You will see Total Number of Student assigned to you for mentoring with Red, Green, Yellow status.

1. **Red: High Probability to Dropout**
2. **Yellow: Moderate Probability to Dropout**
3. **Green: Safe Zone Student**



MENTORING SYSTEM ADVISOR ACCESS

Click on Advisor access you will get all the student with their dropout status which had been marked by red rectangle. There is search box you search a student by Dropout Zone or by their id and name.



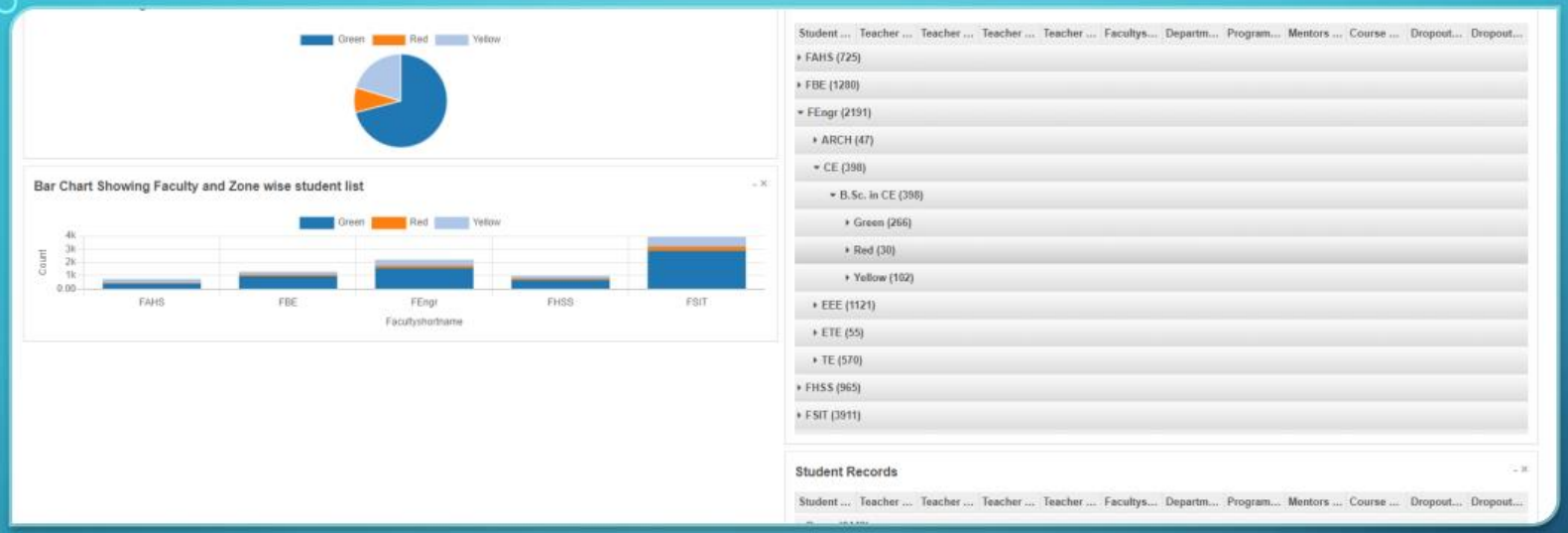
MENTORING SYSTEM SPECIFIC STUDENT

If you click in any specific student from advisor access page you will get details information of that student with mentioned feature below.

1. Major dropout cause according to machine learning with probability.
2. Number of course need to retake

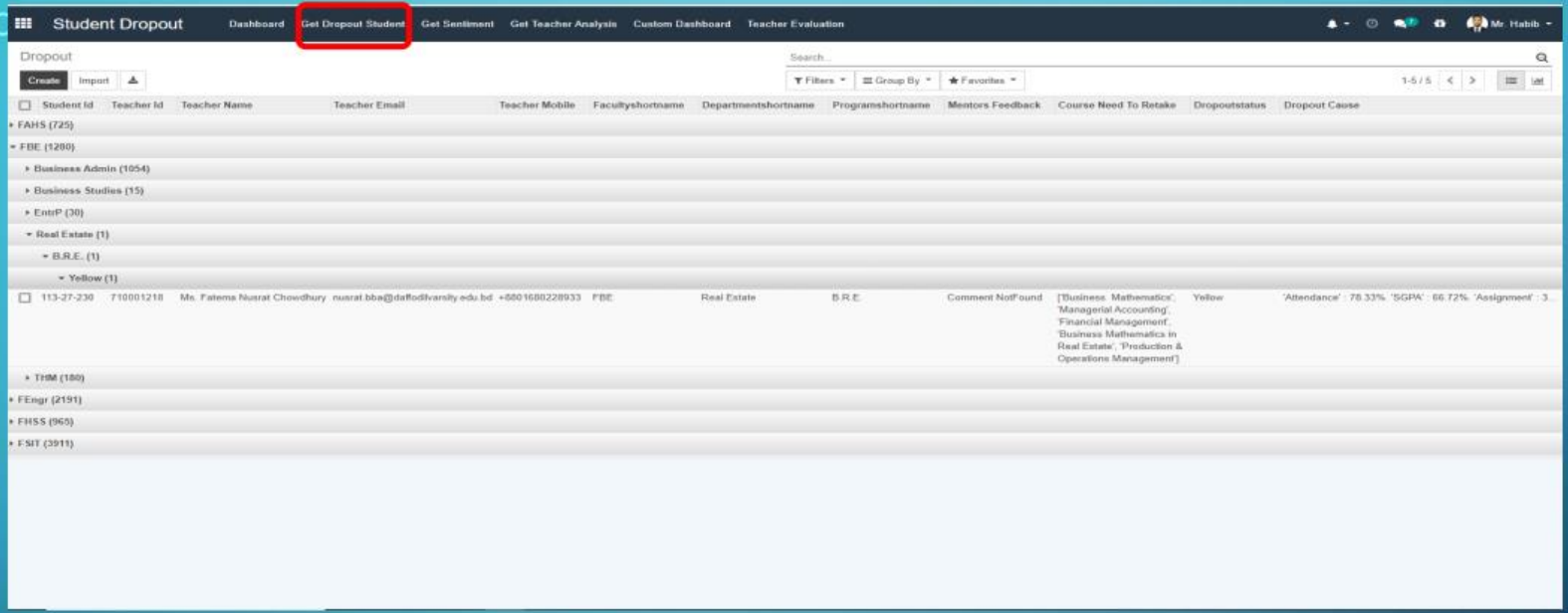
DROPOUT IN SmartEDU

Click this URL http://pd.daffodilvarsity.edu.bd/web this will redirect you to the login page. After you login above mentioned page will open. You will see all the module you have permission to use. If you have permission to use dropout student module you will see red marked icon as mentioned above. Click on it you will be redirect to the dropout dashboard page



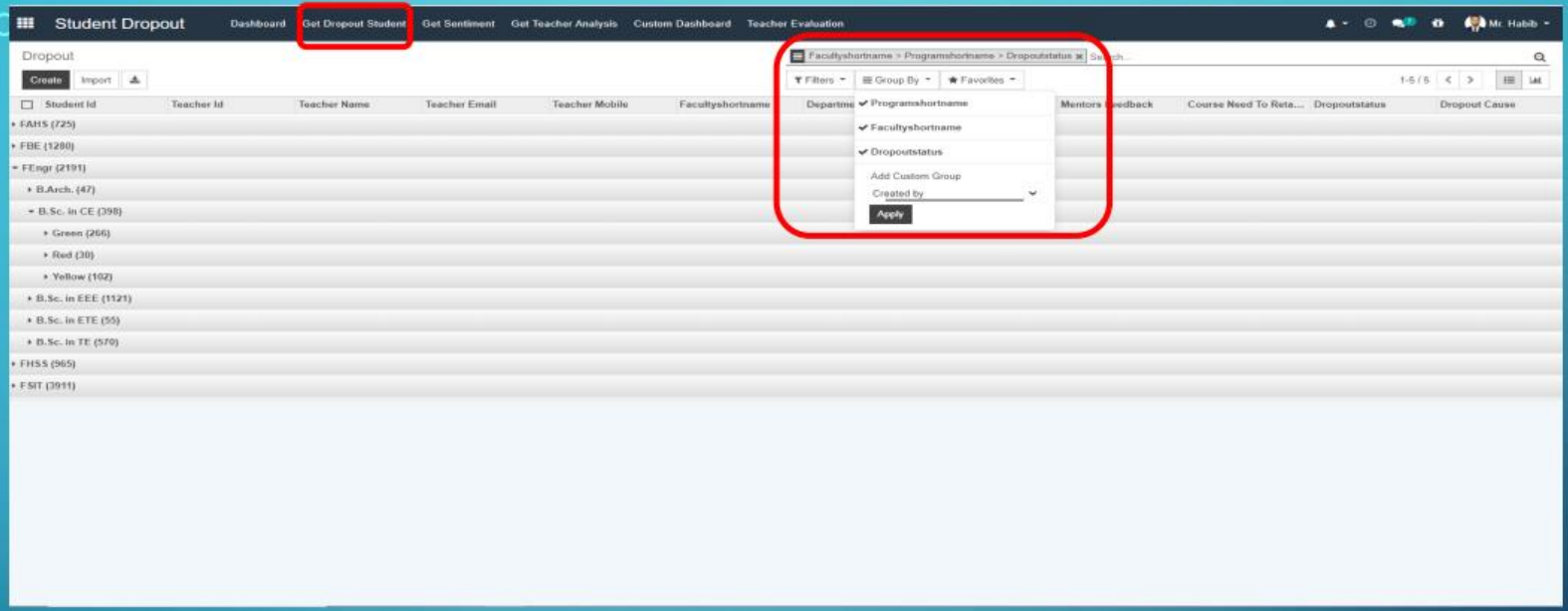
DROPOUT DASHBOARD IN SmartEDU

In this page you will get overall information of all the faculty, department and student with the status of Red, Yellow and Green. You can expand the view



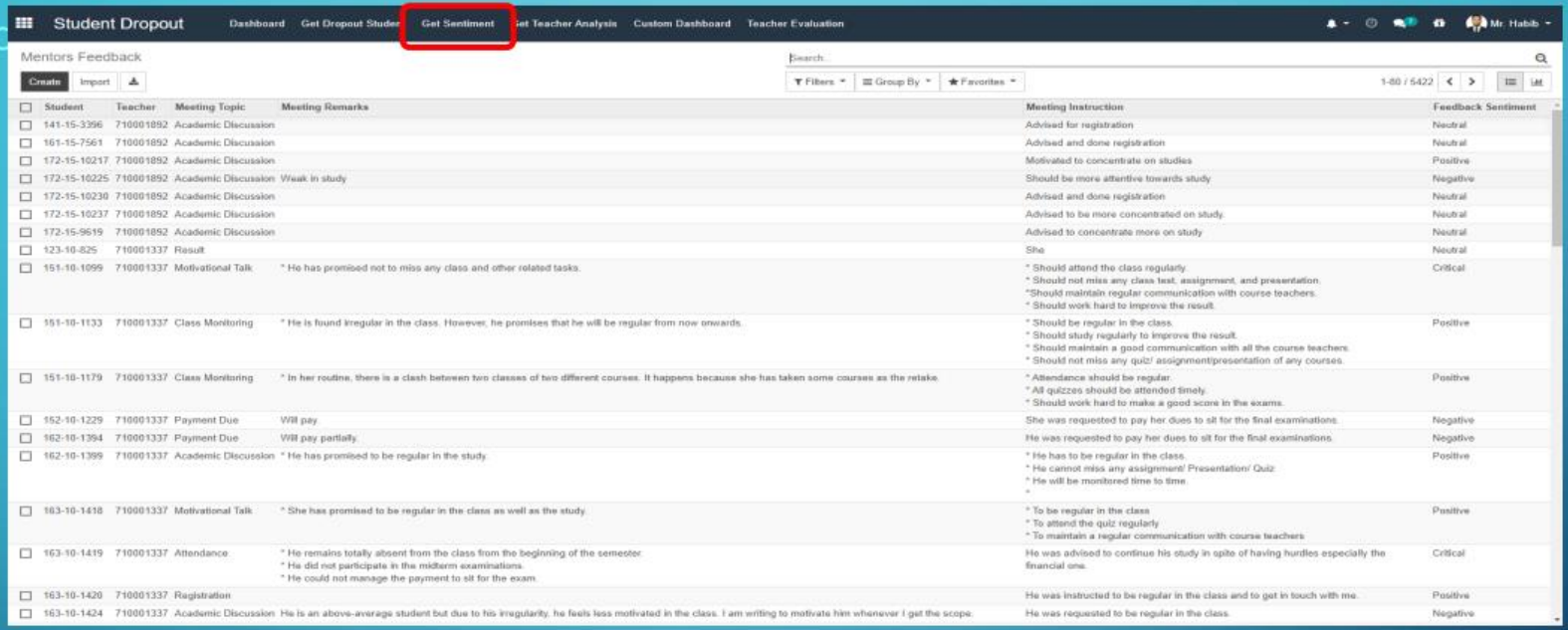
DROPOUT GET DROPOUT STUDENT IN SmartEDU

In this page you will get overall information of all the faculty, department and student with the status of Red, Yellow and Green. You can expand the view.



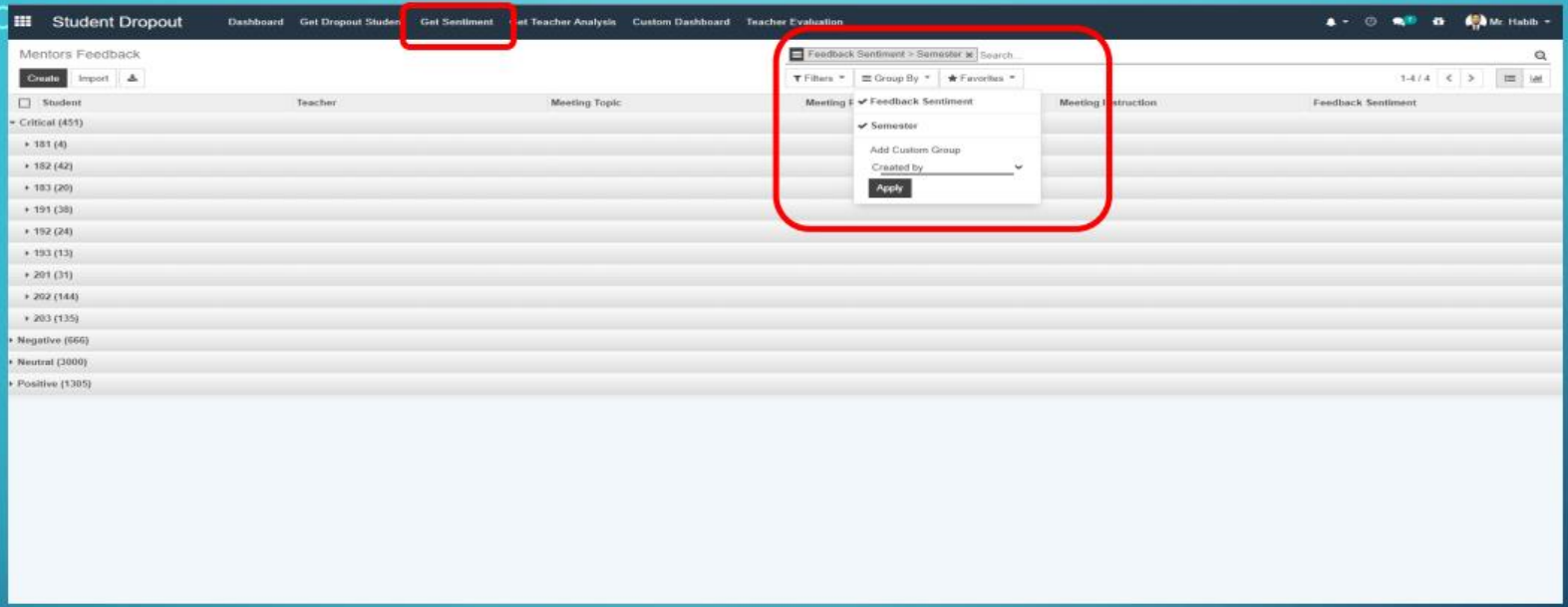
DROPOUT GET DROPOUT STUDENT IN SmartEDU

In this page you will get overall information of all the faculty, department and student with the status of Red, Yellow and Green. You can expand the view. You can also sort by yourself example given in the mentioned picture



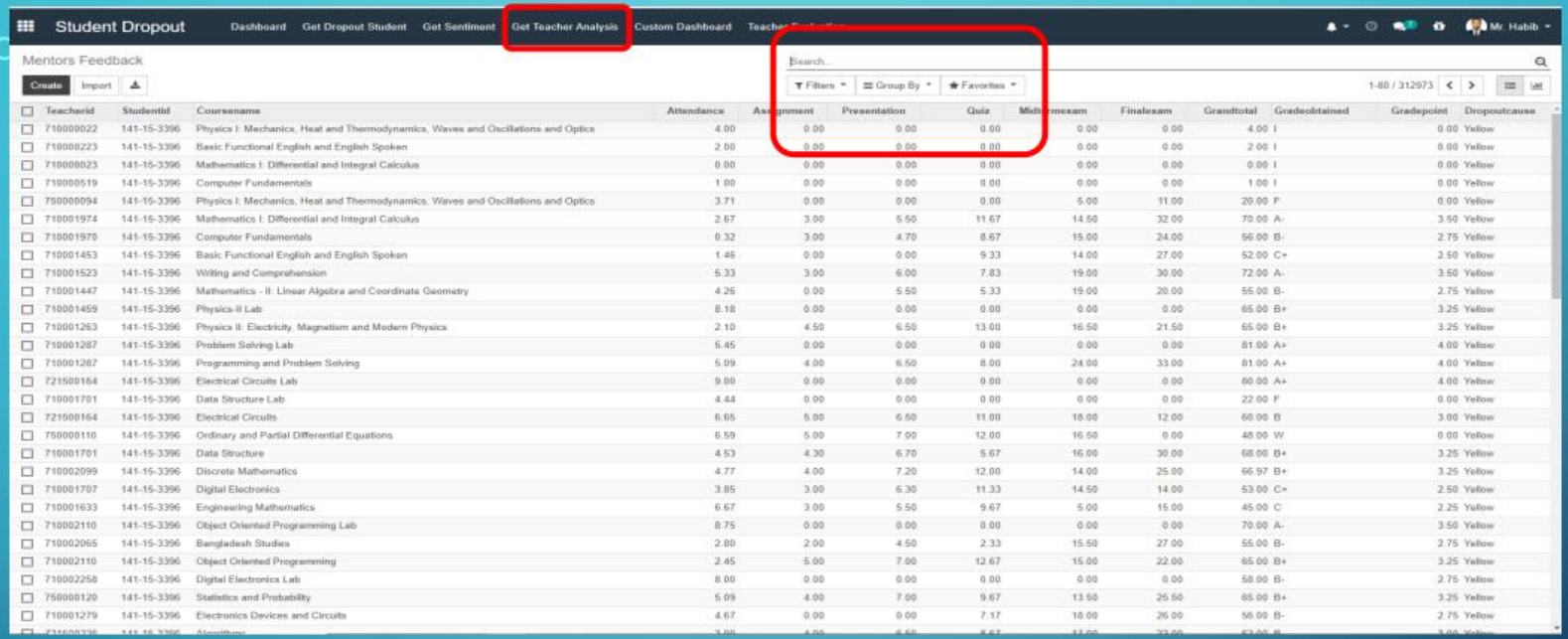
DROPOUT GET DROPOUT STUDENT IN SmartEDU

In this page you will get overall sentiment analysis of mentors comments information the student with the status of sentiment. You can expand the view.



DROPOUT GET DROPOUT STUDENT IN SmartEDU

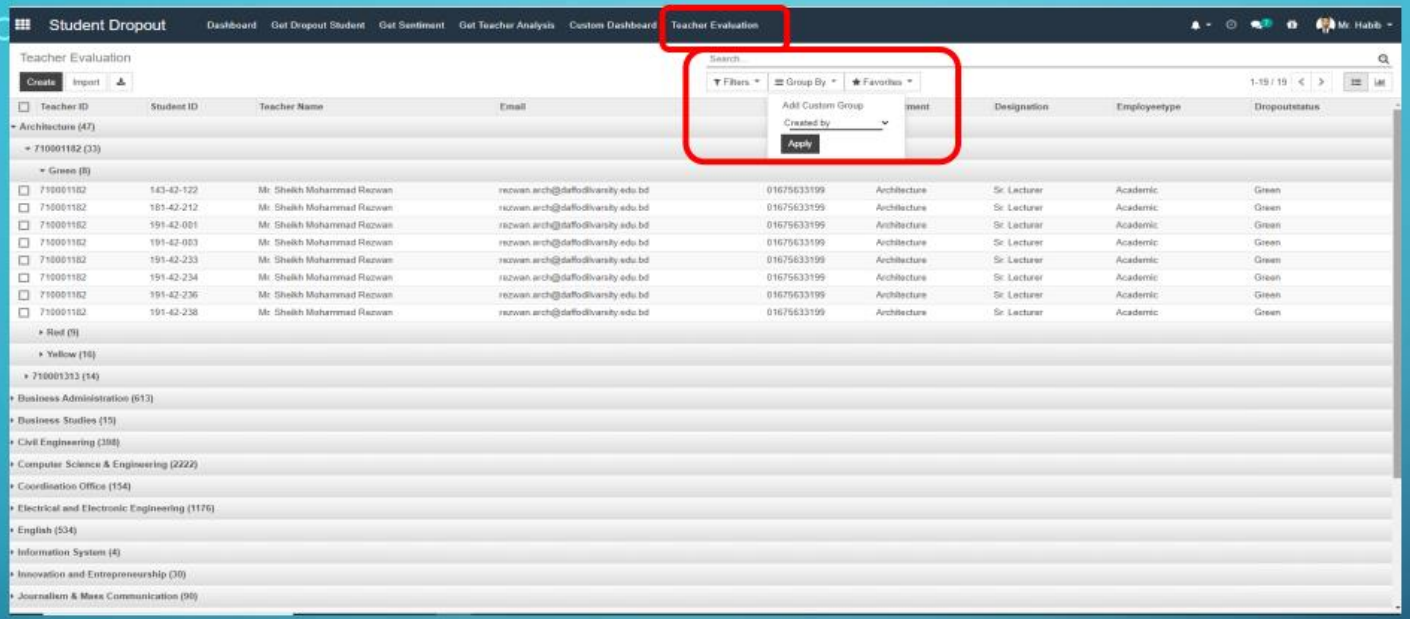
In this page you will get overall sentiment analysis of mentors comments information the student with the status of sentiment. You can expand the view. You can also sort by yourself example given in the mentioned picture



Teacherid	Studentid	Coursename	Attendance	Assignment	Presentation	Quiz	Midtermexam	Finalexam	Grandtotal	Gradeobtained	Gradepoint	Dropoutcause
710000022	141-15-3396	Physics I: Mechanics, Heat and Thermodynamics, Waves and Oscillations and Optics	4.00	0.00	0.00	0.00	0.00	0.00	4.00	I	0.00	Yellow
710000223	141-15-3396	Basic Functional English and English Spoken	2.00	0.00	0.00	0.00	0.00	0.00	2.00	I	0.00	Yellow
710000023	141-15-3396	Mathematics I: Differential and Integral Calculus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	I	0.00	Yellow
710000519	141-15-3396	Computer Fundamentals	1.00	0.00	0.00	0.00	0.00	0.00	1.00	I	0.00	Yellow
750000094	141-15-3396	Physics I: Mechanics, Heat and Thermodynamics, Waves and Oscillations and Optics	3.71	0.00	0.00	0.00	5.00	11.00	20.00	F	0.00	Yellow
710001974	141-15-3396	Mathematics I: Differential and Integral Calculus	2.67	3.00	5.50	11.67	14.50	32.00	70.00	A-	3.50	Yellow
710001970	141-15-3396	Computer Fundamentals	0.32	3.00	4.70	8.67	15.00	24.00	56.00	B-	2.75	Yellow
710001453	141-15-3396	Basic Functional English and English Spoken	1.46	0.00	0.00	9.33	14.00	27.00	52.00	C+	2.50	Yellow
710001523	141-15-3396	Writing and Comprehension	5.33	3.00	6.00	7.83	19.00	30.00	72.00	A-	3.50	Yellow
710001447	141-15-3396	Mathematics - II: Linear Algebra and Coordinate Geometry	4.26	0.00	5.50	5.33	19.00	20.00	55.00	B-	2.75	Yellow
710001459	141-15-3396	Physics-II Lab	8.18	0.00	0.00	0.00	0.00	0.00	65.00	B+	3.25	Yellow
710001263	141-15-3396	Physics II: Electricity, Magnetism and Modern Physics	2.10	4.50	6.50	13.00	16.50	21.50	65.00	B+	3.25	Yellow
710001287	141-15-3396	Problem Solving Lab	5.45	0.00	0.00	0.00	0.00	0.00	81.00	A+	4.00	Yellow
710001287	141-15-3396	Programming and Problem Solving	5.09	4.00	6.50	8.00	24.00	33.00	81.00	A+	4.00	Yellow
721500164	141-15-3396	Electrical Circuits Lab	9.00	0.00	0.00	0.00	0.00	0.00	80.00	A+	4.00	Yellow
710001701	141-15-3396	Data Structure Lab	4.44	0.00	0.00	0.00	0.00	0.00	22.00	F	0.00	Yellow
721500164	141-15-3396	Electrical Circuits	6.65	5.00	6.50	11.00	18.00	12.00	60.00	B	3.00	Yellow
750000110	141-15-3396	Ordinary and Partial Differential Equations	6.59	5.00	7.00	12.00	16.50	0.00	48.00	W	0.00	Yellow
710001701	141-15-3396	Data Structure	4.53	4.30	6.70	5.67	16.00	30.00	68.00	B+	3.25	Yellow
710002099	141-15-3396	Discrete Mathematics	4.77	4.00	7.20	12.00	14.00	25.00	66.97	B+	3.25	Yellow
710001707	141-15-3396	Digital Electronics	3.85	3.00	6.30	11.33	14.50	14.00	53.00	C+	2.50	Yellow
710001633	141-15-3396	Engineering Mathematics	6.67	3.00	5.50	9.67	5.00	15.00	45.00	C	2.25	Yellow
710002110	141-15-3396	Object Oriented Programming Lab	8.75	0.00	0.00	0.00	0.00	0.00	70.00	A-	3.50	Yellow
710002065	141-15-3396	Bangladesh Studies	2.80	2.00	4.50	2.33	15.50	27.00	55.00	B-	2.75	Yellow
710002110	141-15-3396	Object Oriented Programming	2.45	5.00	7.00	12.67	15.00	22.00	65.00	B+	3.25	Yellow
710002258	141-15-3396	Digital Electronics Lab	8.00	0.00	0.00	0.00	0.00	0.00	58.00	B-	2.75	Yellow
750000120	141-15-3396	Statistics and Probability	5.09	4.00	7.00	9.67	13.50	25.50	65.00	B+	3.25	Yellow
710001279	141-15-3396	Electronics Devices and Circuits	4.67	0.00	0.00	7.17	18.00	26.00	56.00	B-	2.75	Yellow

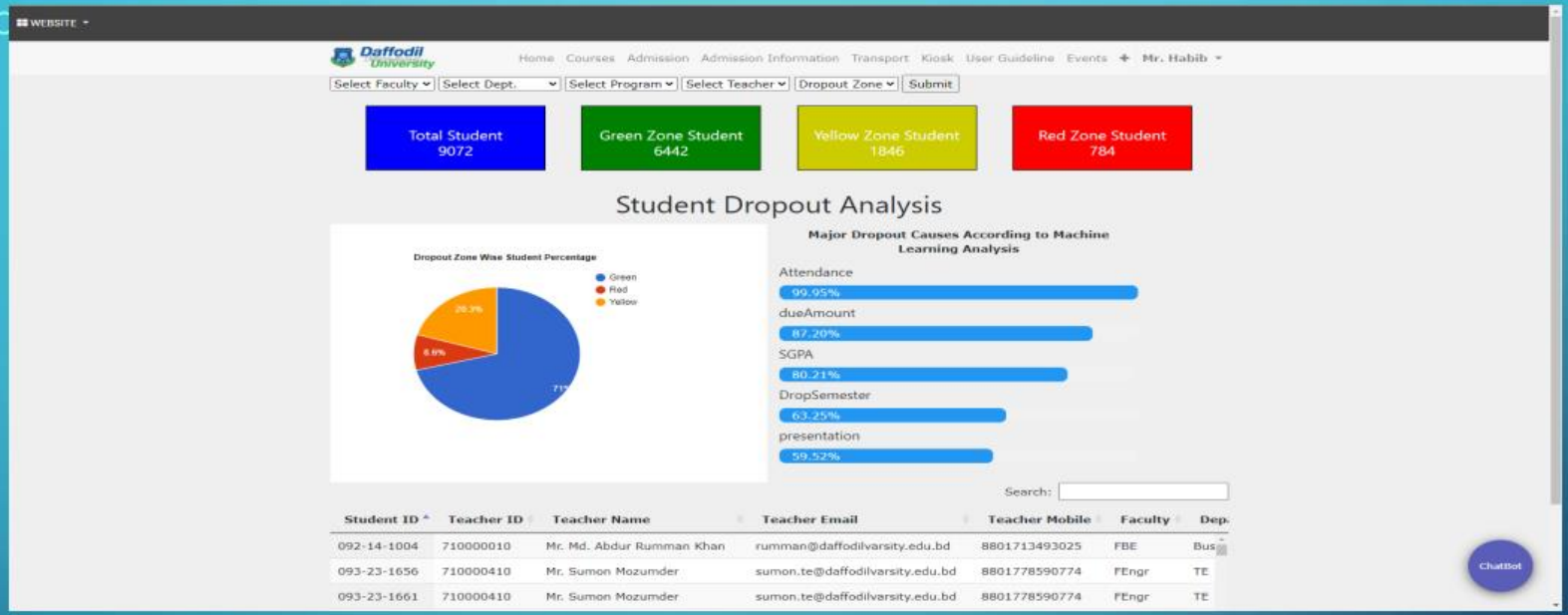
DROPOUT GET TEACHER ANALYSIS IN SmartEDU

In this page you will get course wise student and teacher with attendance, assignment, presentation, midterm exam, final exam, grand total, grade, grade point and dropout status. You can also sort by yourself example given in the mentioned picture



DROPOUT TEACHER EVALUATION IN SmartEDU

In this page you will get all the mentors and assigned student with dropout status. You can also sort by yourself example given in the mentioned picture



DROPOUT CUSTOM DASHBOARD IN SmartEDU

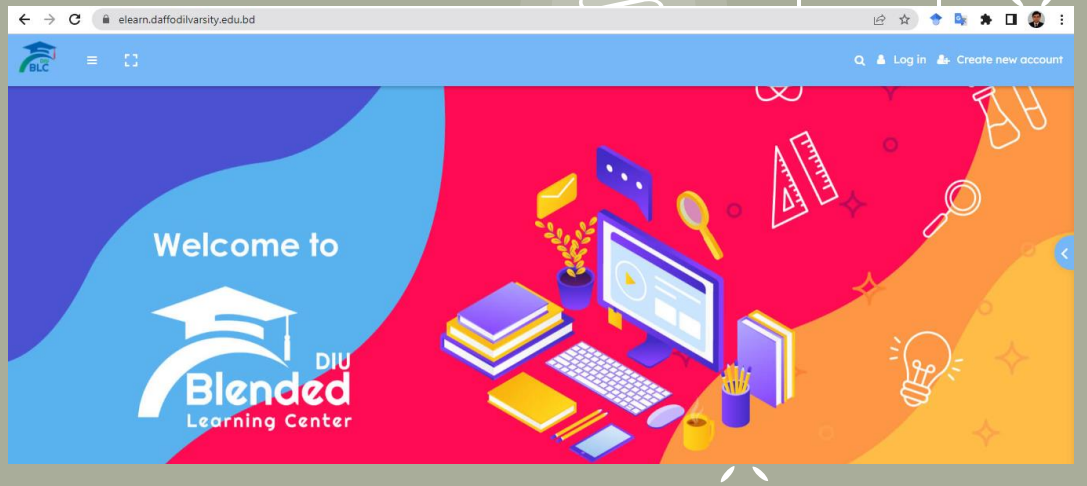
In this page you will get overall information of all the faculty, department and student with the status of Red, Yellow and Green. You will also get all the mentors and assigned student with dropout status.

Impact Analysis

To ensure quality assurance in higher education institutes and to automate the process, DIU has taken initiative to automate its implementation process where QA cell loos into the evaluation and monitoring process for adjudging the real time development or progress. to design the quality assurance process management system on a service oriented architecture (SOA). SOA has been chosen for the transparently, scalability, and Integrity of this architecture.

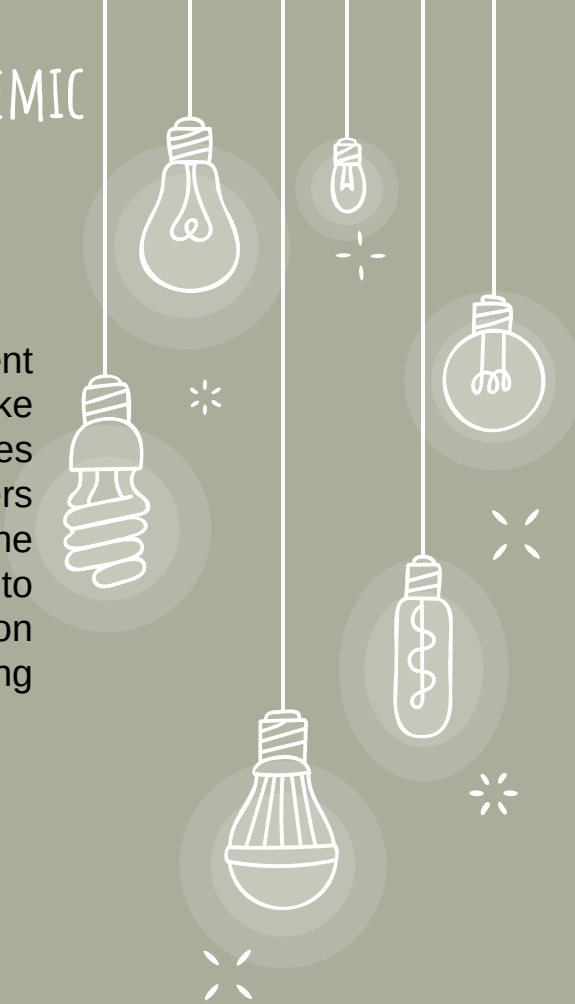
USE OF THE LATEST DEVELOPMENTS IN TECHNOLOGY

In Daffodil International University, we introduced the Blended learning Center (BLC) platform in around 2016. Since then, our academic departments have been engaged to develop online course repositories. However, that time students were mostly engaged through the traditional face to face class system. When the pandemic started in Bangladesh and we faced the first lockdown, we took immediate steps to onboard all students and teachers to online education through the BLC platform.



USE OF THE LATEST DEVELOPMENTS IN TECHNOLOGY- DURING PANDEMIC

On top of that the university offered 100s of webinars and circulated different digital guidelines to both teachers, students and administrators on how to take preparations at individual level to cope up with different initiatives and changes done by the university. Because of these initiatives, the majority of the teachers became well equipped to take classes online, could create and circulate online courses, contents and materials through the BLC platform for the students to study, engage the students through different interactive contents and discussion forums to further enhance their learning process, assess the students learning from creating online quizzes, assignments and online workshops.



One Student One Laptop

Knowledge and Technology across Borders

Daffodil International University

Since 2010, with a view to making every student of DIU dynamic and fit with global challenges, DIU distributed around **40,000 laptops** to students under **"One Student One Laptop"** project first time in **Bangladesh**

goedu

INTERNATIONAL OPEN UNIVERSITY

Smart Edu

Daffodil International University

Collaboration

coursera edX LinkedIn LEARNING

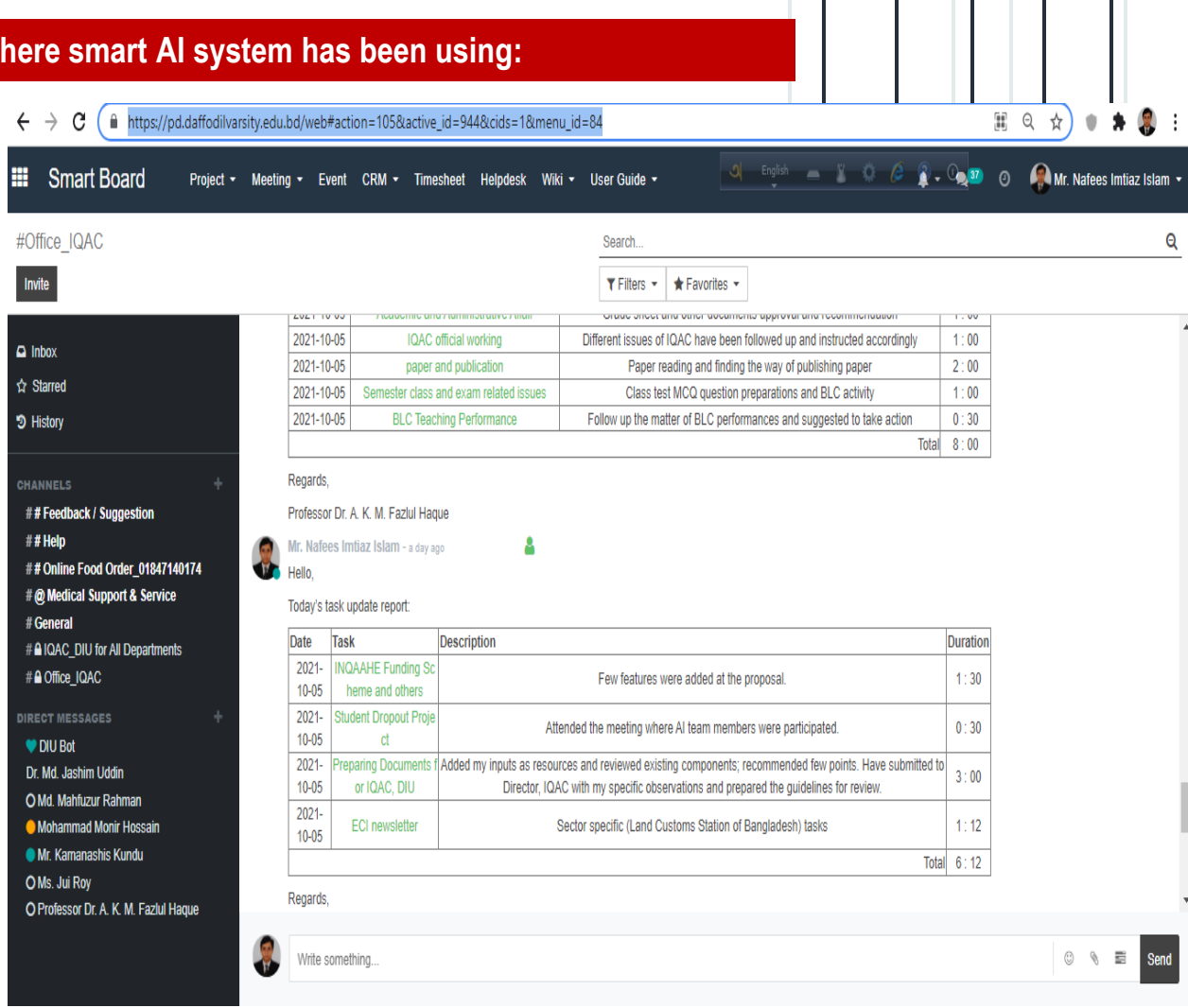
saylor.org ACADEMY

DIU uses AI in decision making and employs at the operational tasks

Integration of AI helps all entities to reap the benefit. Artificial intelligence displayed by machines, in contrast with the natural intelligence (NI) displayed by humans and other animals. AI research is defined as the study of "intelligent agents". DIU employs AI in different operational areas.

Few are some of the initiatives of DIU where smart AI system has been using:

DIU has introduced all the process of the university (administrative) is made digital through SmartEdu ERP (Partially AI based) developed by Daffodil Computers Limited which is a concern of Daffodil Family which even covers the digitization of different reports, digital communication, digital meetings, HR management, transport management, policy management etc. I believe all these initiatives can contribute to developing models for new formats, contents and delivery channels for other educational institutions and national policy makers.



Thanks!

Any questions?

You can find us at:

- emran@daffodilvarsity.edu.bd
- nafees-research@daffodilvarsity.edu.bd