



BCA STUDENTS RESULT ANALYSIS USING R

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Abstract—

R Studio Cloud is an open-source data analysis platform. R studio cloud platform allows users to conduct a number of tasks for analysis and processing of data. It uses many statistical modelling algorithms for finding a better result on various data. Education is most important part of our life. There are lots of education data available in whole world. World today has realized the importance of education in colleges, gurukul, institute, schools. The most important things that how to complete our task (result analysis) with in time. In today's scenario R studio cloud provides many statistical function and data visualization method to find out result according to condition. In this research paper we have done result analysis of our BCA Sixth Semester students to our college BTTS. This research paper will able to help to calculate performance-based result according to subject.

Keywords- RStudio, R Statistical Tools, R Package, Big Data Analysis Tools, CSV, data visualization.

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I. INTRODUCTION

This paper focused on Education. The main focus of this paper to predict BCA student result based on their performance. In this paper we will analyze predict result of BCA students with the help of university dataset. In this dataset we will use BCA 6 semester dataset. Firstly, we load dataset. This type of dataset is called training dataset which is contains multiple information like enrollment no, name, gender, IAP, EAP, OASP, Values etc. Here we also find how many students are male/female and what is overall subject percentage on that student.

In this paper we identified and explained many factors which will helpful to improve academic

performance of students in colleges. In this research paper we have analyzed the performance of students. In this paper we will use statistical analytical tools and use data visualization technique to representation our result. We will analyze result according to some criteria like to Calculate percentage of all student with the help of data visualization technique, find how many students got highest percentage? to find total marks of each student in internal assessment. to calculate total marks of each student in External assessment. to find how many students passed/fails according to male/female ratio in semester? To identify top 10 students which has highest percentage. In this step we have analyzed that how could we



upgrade these students for getting Gold Medal. To find bottom 10 students which has lowest percentage. In this step we have analyzed that these students are weak students so how could be improving these students for better result.

We have implemented some statistical tools for this research paper. This student result analysis system is helpful to find out that how is the working of our students.

This is very tedious task to find out each and every student result analysis. So, completing this tedious task we used R studio cloud. And we will represent student result data with the help of data visualization technique.

II. DATA COLLECTION AND PREPARATION

In this paper we have considered those students who are passed Bachelor of Computer

Application (BCA) Semester 6 of BTTS (Affiliated to GGSIPU). University shows the result in PDF format. My colleague solved this problem. After that we loaded data set in CSV/Excel format in R, then we performed result analysis on this data. After data collection we used some variables to find out prediction of student's performance in university examination. These variables/columns are used to finding students' performance. Some variables/columns are used to find result according to research study like values, Internal Assessment, external assessment, subjects, gender, OASP, TAT etc. We defined some another attributes to assessment of students and mentioned these attributes according their values. We defined their attributes on four parts: Excellent, Good, Average, Poor.

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Attributes	Description	Values
Internal Assessment	Internal Assessment of BCA Sixth Sem Students	Excellent, Good, Avg, Poor
External Assessment	External Assessment of BCA Sixth Sem Students	Excellent, Good, Avg, Poor
Overall Assessment	Overall Assessment of BCA Sixth Sem Students	Excellent, Good, Avg, Poor

Table 1: Assessment Attributes and Assigning Values

III. DATA PROCESSING

Data processing is most important task after data collection. It is used to identify irrelevant, noisy data and redundant information from dataset. We will perform processing according to Range Criteria according to their attributes:

Attributes	Range
Internal Assessment	IA%>=90 then Excellent, IA%>=75 and <90 then Good, IA >=60 and <75 then Avg, IA <60 then Poor
External Assessment	EA%>=90 then Excellent, EA%>=75 and <90 then Good, EA >=60 and <75 then Avg, EA <60 then Poor
Overall Assessment	OA%>=90 then Excellent, OA%>=75 and <90 then Good, G >=60 and <75 then Avg, G<60 then Poor

Table 2: Range Criteria of Assessment



IV METHODOLOGY

University shows the result in PDF format. My colleague solved this problem, and converted this dataset to csv/excel format. After that we performed result analysis on this data. After data collection we used some variables to find out prediction of student's performance in university examination. We will use RStatistical Methods for finding Result. For finding better result we will use some Method like Research Question, Research Strategy. Therefore, the research questions proposed in this study are:

4.1 Research Questions

- To Identify HPIA (Highest Percentage in Internal Assessment).
- To identify HPEA (Highest Percentage in External Assessment).
- To identify OASP (Overall Subjects Percentage).
- To identify Male Female Passing Ratio.
- To identify TTS (Top Ten Students). In this step we have analyzed that how could we upgrade these students for getting Gold Medal.
- To identify BTS (Bottom Ten Students). In this step we have analyzed that these students are weak students so how could

be improving these students for better result.

- To identify MFP on Overall Subject.
- To identify result according to their Values (like E-Excellent, G-Good, A-Average and P-Poor)

We are using some statistical method to identify these parameters which are shown above.

4.2 Research Strategy

We have used some Statistical tools for research study with the help of R Studio cloud. We used R statistical research tools for finding this research question answer. And for resulting we used Data visualization tools of R. The resulting techniques used according student performance like. HPIA (Highest Percentage in Internal Assessment), HPEA (Highest Percentage in External Assessment), PFR (Pass/Fail Ratio), TTS (Top Ten Students), BTS (Bottom Ten Students), MFP (Male Female Percentage) and Values concern (like E-Excellent, G-Good, A-Average and P-Poor). Finding a better result, we have used some data analysis method/tools in R Studio Cloud. Here we are showing research methodology and Strategy which we are using in this research paper.

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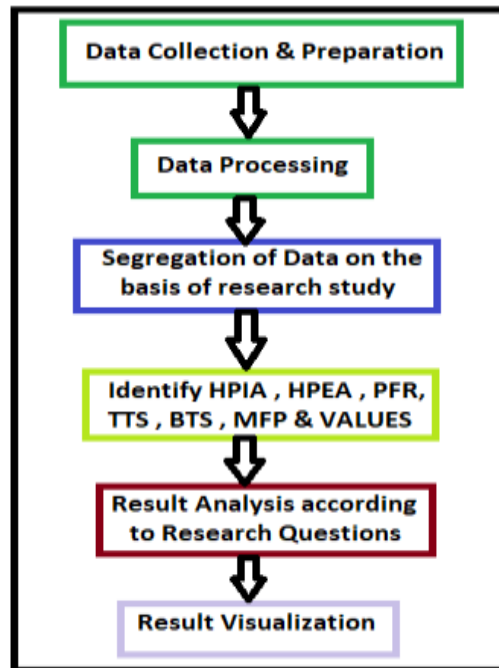


Figure 1: Research Methodology & Strategy

V RESULT ANALYSIS

Theory Assessment:

IAT (Internal Assessment Theory) (25 Marks) and EAT (External Assessment Theory) (75 Marks)

Lab Assessment:

IAL (Internal Assessment Lab) (40 Marks) and EAL (External Assessment Lab) (60 Marks)

NUES Assessment:

NUES Assessment (100 Marks)

TAT (Total Assessment Theory) = IAT+EAT (100 Marks)

TAL (Total Assessment Lab) = IAL + EAL (100 Marks)

TNA (Total NUES Assessment) = 100 Marks

OAA (Overall Assessment) = TAT + TAL + TNA

OASP (Overall Subjects Percentage) = OAA (Overall Assessment)

Subjects of BCA Sixth Semester: (Data Ware Housing and Data Mining (DWDM) , Mobile Computing (MC) , LINUX ,Network Security (NS) , LINUX LAB , MP (Major Project) , SEMINAR)

5.1 Identify HPIA (Highest Percentage in Internal Assessment):

a. HPIA in Theory:In Internal Assessment Theory with the help of R, we identified that these three students whose **Enrollment Number were 10, 12, 14.** have got the highest percentage.



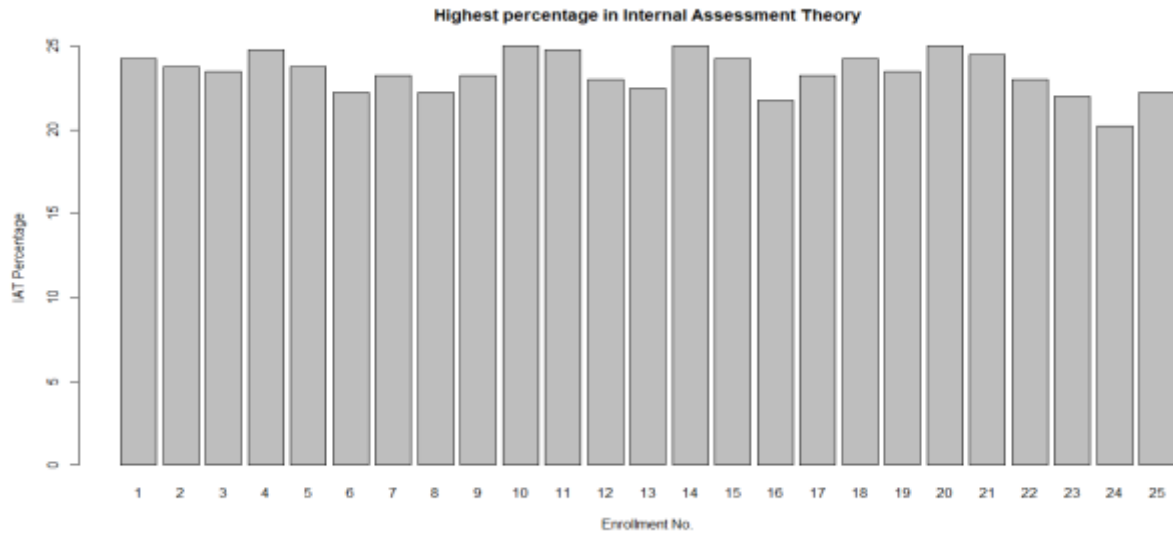
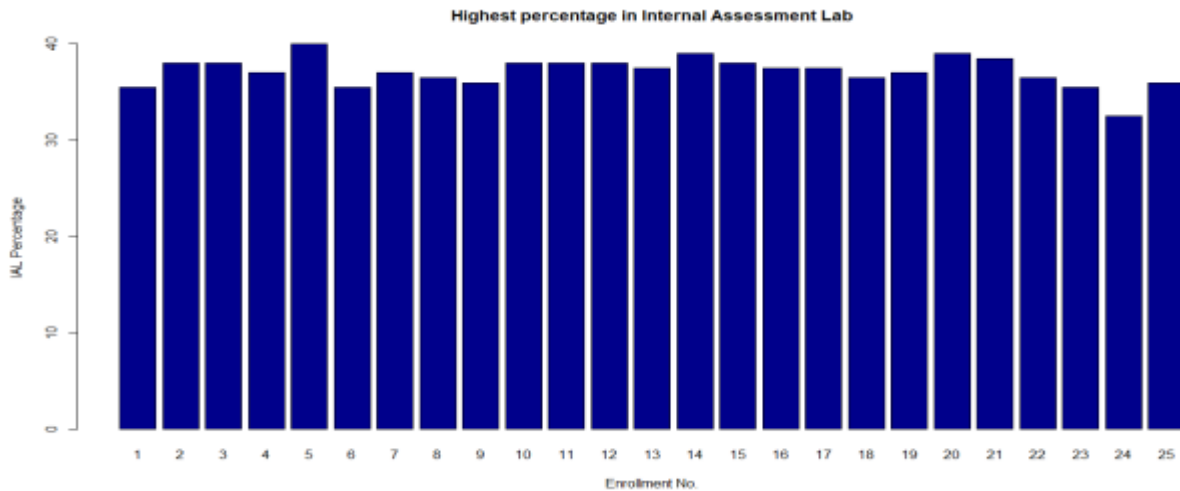


Figure 2: Highest Percentage of Students in IAT

b. HPIA in LAB:In Internal Assessment Lab with the help of R, we identified that one student whose Enrollment Number was 5 have got the highest percentage.



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Figure 3: Highest Percentage of Students in IAL

5.2 Identify HPEA (Highest Percentage in External Assessment):

a. HPEA in Theory:In External Assessment in Theory with the help of R, we identified that one student whose Enrollment Number was 1 have got the highest percentage.



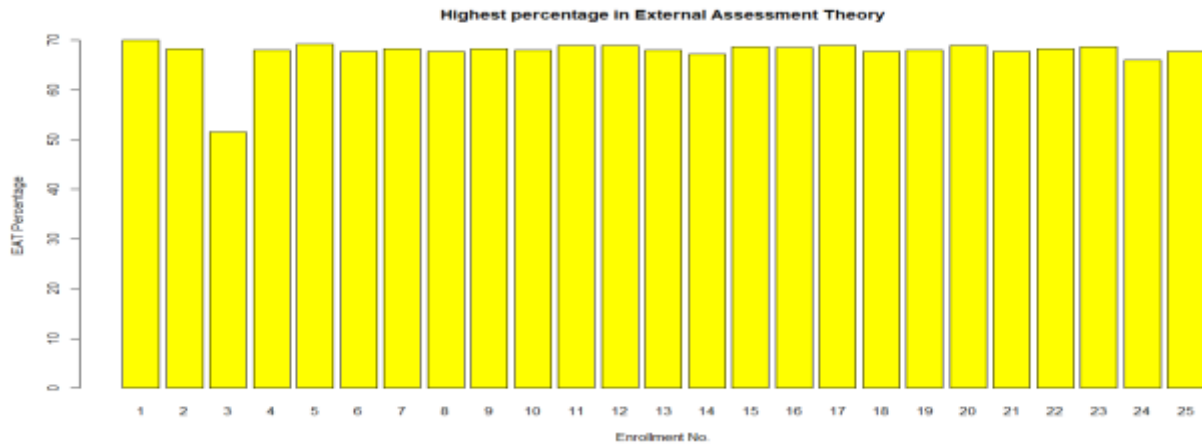
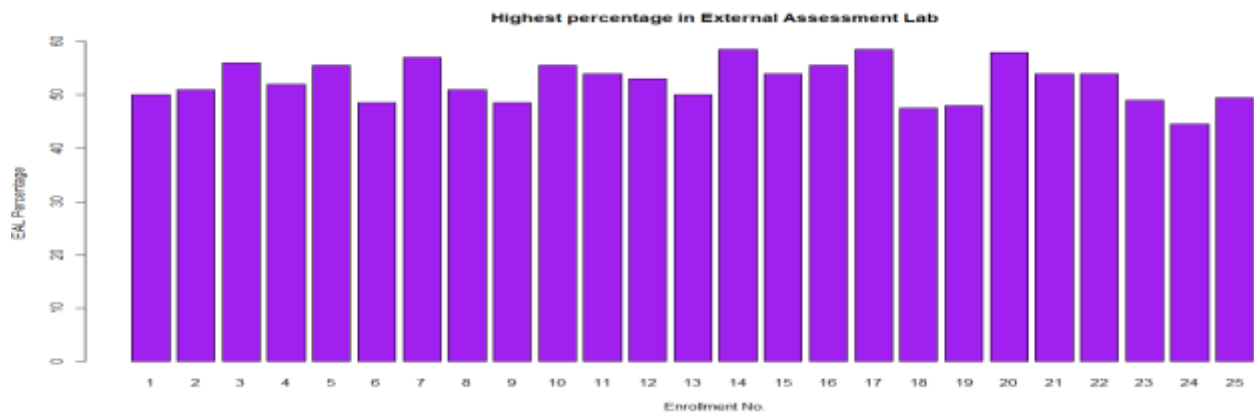


Figure 4: Highest Percentage of Students in EAT

b. HPEA in LAB:In External Assessment Lab with the help of R, we identified that these two students whose Enrollment No. was 14 and 17. Those got the highest percentage.



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Figure 5: Highest Percentage of Students in EAT

5.3 Identify OASP (Overall Subjects Percentage):In Overall subject Assessment with the help of R, we identified that one student whose Enrollment Number was 20 have got the highest percentage.



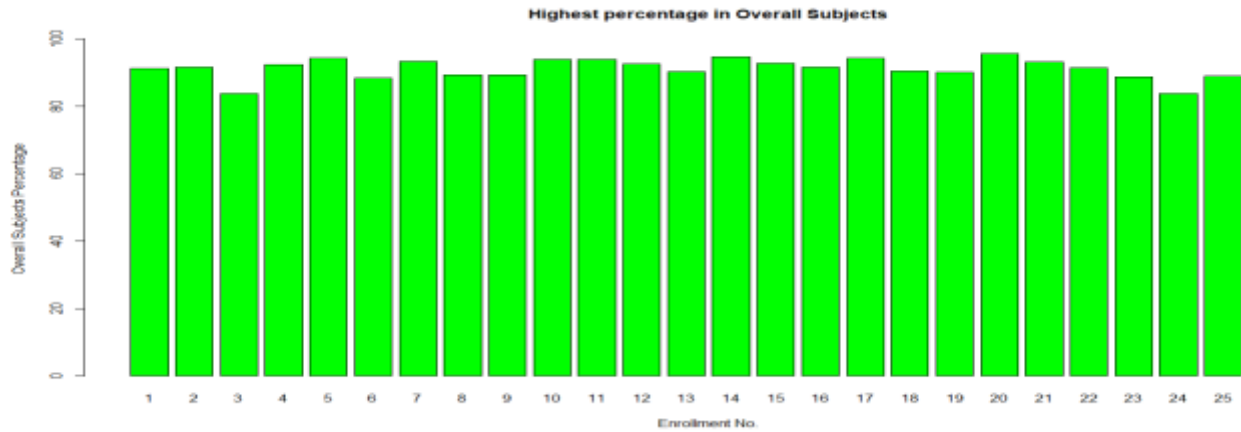


Figure 6: Highest Percentage of Students in OAS

5.4. To identify MF Passing Ratio: In this part we analyzed that Overall students in BCA 6 Semester (16% Female and 84%Male) have been passed in Good and Excellent Marks.

5.5 Identify TTS (Top Ten Students on OASP (Overall Subjects Percentage)): In this step we have analyzed that how could we upgrade these students for getting Gold Medal. Here we saw that Enrollment No. 5,7,10,11,12,14,15,17,20 and 21 are Top ten students.

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Enrollment No	VALUES	Gender	OAS PER
<dbl>	<chr>	<chr>	<dbl>
5	EXCELLENT	M	94.3
7	EXCELLENT	F	93.3
10	EXCELLENT	M	94
11	EXCELLENT	F	94
12	EXCELLENT	M	92.6
14	EXCELLENT	M	94.7
15	EXCELLENT	M	92.9
17	EXCELLENT	M	94.3
20	EXCELLENT	M	95.6
21	EXCELLENT	M	93.1

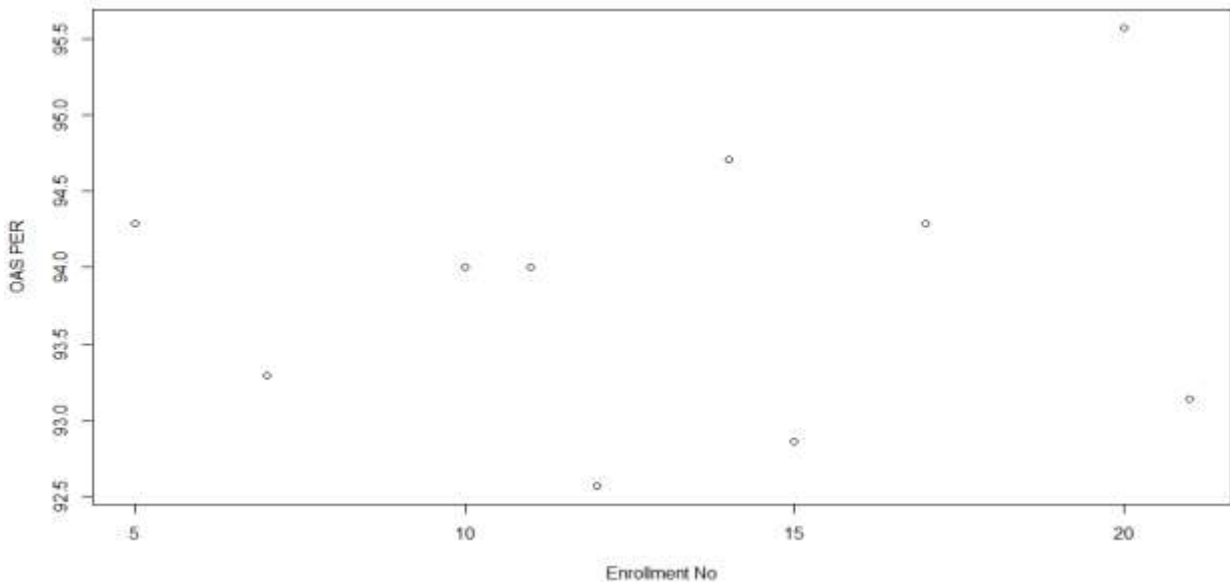


Figure 7: Top 10 Students Percentage

5.6 Identify BTS (Bottom Ten Students on OASP (Overall Subjects Percentage)): In this step we have analyzed that these students are weak students so how could be improving these students for better result. Here we saw that Enrollment No. 3,6,8,9,13,18,19,23,24 and 25 are Bottom Ten Students.

Enrollment No	VALUES	Gender	OAS PER
<dbl>	<chr>	<chr>	<dbl>
3	GOOD	M	83.7
6	GOOD	M	88.3
8	GOOD	M	89.3
9	GOOD	F	89.3
13	EXCELLENT	M	90.3
18	EXCELLENT	M	90.4
19	EXCELLENT	M	90.1
23	GOOD	M	88.7
24	GOOD	M	83.9
25	GOOD	M	88.9

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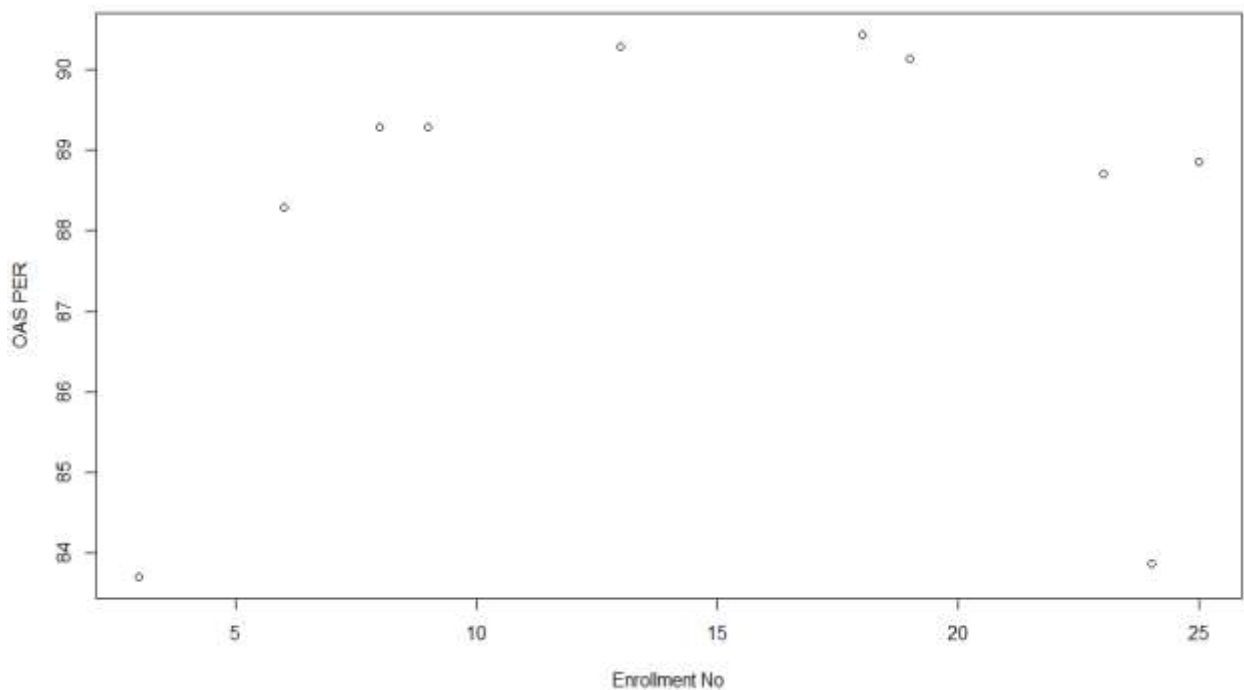


Figure 8: Bottom 10 Students Percentage

5.7 Identify MFP (Male Female Percentage on OAS): In this Research Questions we have identified total percentage of Male and Female in BCA 6 Sem Result.




```
> totalstudents <- nrow(X6_Sem_Result)
> allfemalestudents <- dplyr::filter(X6_Sem_Result,Gender %in% "F")
> totalfemale <-nrow(allfemalestudents)
> allmalestudents <- dplyr::filter(X6_Sem_Result,Gender %in% "M")
> totalmale <- nrow(allmalestudents)
> percentagemale <- (totalfemale/totalstudents)*100
> percentagemale <- (totalmale/totalstudents)*100
> percentage_female <- (total_female/total_students)*100
> percentage_female
[1] 16
> percentage_male
[1] 84
```

Figure 9: Male and Female Percentage Ratio (16% Female & 84% Male)

5.8. Identify result according to their Values on OAS (like E-Excellent, G-Good, A-Average and P-Poor):In this part we have identify performance of students got in overall subject like Excellent, Good, Avg and Poor. Here we found only Good and Excellent students was available according to Range Criteria. No anybody available poor and average student.

'Enrollment No`	VALUES	Gender	'OAS PER`	'Enrollment No`	VALUES	Gender	'OAS PER`
<dbl>	<chr>	<chr>	<dbl>	<dbl>	<chr>	<chr>	<dbl>
				1	EXCELLENT	F	91.3
				2	EXCELLENT	M	91.6
				4	EXCELLENT	M	92.4
				5	EXCELLENT	M	94.3
				7	EXCELLENT	F	93.3
				10	EXCELLENT	M	94
				11	EXCELLENT	F	94
				12	EXCELLENT	M	92.6
				13	EXCELLENT	M	90.3
				14	EXCELLENT	M	94.7
				15	EXCELLENT	M	92.9
				16	EXCELLENT	M	91.6
				17	EXCELLENT	M	94.3
				18	EXCELLENT	M	90.4
				19	EXCELLENT	M	90.1
				20	EXCELLENT	M	95.6
				21	EXCELLENT	M	93.1
				22	EXCELLENT	M	91.4
3	GOOD	M	83.7				
6	GOOD	M	88.3				
8	GOOD	M	89.3				
9	GOOD	F	89.3				
23	GOOD	M	88.7				
24	GOOD	M	83.9				
25	GOOD	M	88.9				

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Figure 10: Show Result According to VALUES Attributes

VI - CONCLUSION

This BCA students result analysis is helpful to find out many things HPIA, HPEA, OASP, MF

Percentage, TTS (Top Ten Students), BTS (Bottom Ten Students), MFP (Male Female



Percentage), Result according to their Values of Students.

This result analysis is beneficial for solving manpower and time-consuming problem for finding result. This analysis helpful to achieve success in education. Using this system, we find male/female student percentage ratio, top ten students, bottom ten students, oasp etc. After analysis we can also generate report. In Future work this will be further enhanced and design a complete system on this. Also, we will discuss our next paper we will include some algorithm to find more better result/prediction of old result also.

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