Attendance of students in the class and their performance

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Abstract- We consider attendance of students in the class as the only factor that may influence their performance and we relied on the standard methods of statistics to analyze the correlations in between the attendance and the performance of the students. It has been found that those students are doing well in the class examinations whose attendance is above 60%, and therefore, the performance of the students is positively correlated to their good attendance percentage in the class. We propose that a comprehensive study of this kind may be useful in analyzing the factors responsible for decline of student's performance and then suitable corrective measures may be taken to enhance possibility that trained students may secure their future on the basis of their selection based on their merit.
Keywords – Students; Attendance; Merit; Future

I. INTRODUCTION

The Government spends huge fund on the Education. The fund is required to meet out the expenditures incurred in the form of salary of the employees and in creating infrastructures of the academic institutions. However, the performance of the students of several academic institutions is not up-to the mark. Therefore, poverty/unemployment turns out to be an unavoidable issue of botheration for the Governments. The issue of poverty/unemployment may be addressed by the way of proper teachings/training of the students at their class room in the academic institutions which may lead to ensure suitable employment for them. So that the nation's man power for the Government/self employments may be prepared. In other words, by the proper training through class room lectures/demonstrations may also be useful to prepare the youth for at least their self employment. And also, the suitable training may act as an essential ingredient to nurture interest among the young minds so that they may choose appropriate area/option(s) of their interest and thus, the youth may choose appropriate option(s) of employment for their livelihood.

Training of the students at the academic institutions by the experts may be achieved by ensuring student's presence at their theory/laboratory/demonstration related classes in the institution. Thus, attendance of the students at the academic institutions may be a core factor, and therefore for the present analysis, the student's attendance had been chosen as an important and only factor that may affect the performance of the students. We use standard methods of statistics1 in the present study to understand correlations in between the attendance percentage and the percentage of marks obtained (i. e. performance) by the students in the course/paper test.

It is understood that the performance of the students may be influenced by the combination of academic and/or non academic factors[1-4] and these factors may vary from an academic institution[2-6] to any other institution[2,3,5]. The performance of the students may also vary from one course/paper to another set of course/paper for the same class[2-5]. The chosen criteria (or the factors) may be academic and also the criteria may be non-academic[5-12] in nature and these factors may influence the student's performance in the complex manner. Therefore, a comprehensive study of this kind should include the academic factors[1-8] e. g. student's achievement say at the Undergraduate level (in context to present study), their admission criteria in the Post Graduate level (in reference to present study), teaching and learning techniques used in the class by the teachers/experts and other demographic information relevant to similar studies[2-12]. The non-academic factors may be the income of the student's parents, exposure to the students about the current trend of the courses and the output of the courses in the form of employment to the course students[6-9].

While considering other factors for such studies, it is apparent that the data collected through survey on small number of the student's related courses/subjects may not be suitable as the small number of data/sample size may affect the study of the present kind in the unusual manner. Therefore, present study is merely based on the attendance of the students in the class to access their performance, and thus it appears suitable to learn the correlations in between the attendance and the performance of the students through their internal/external test.

II. STATEMENT OF THE STUDY AND THE PROPOSED OBJECTIVES

An attempt has been made to define relationship between the attendance percentage and the student's performance in their class/course/paper to see the impact of the class room teachings/training. However, a comprehensive study

of this type may be useful to understand significant determinants that may be addressed at the appropriate stages of their (students) study so that the performance of the students may improve and also the suitable corrective measures may be incorporated in the Government's policy to tackle issue of the unemployment and also to mentor/prepare for their livelihood. In other words, the training/teachings of the experts may inculcate interest among the youth in preparing them for self employment or the government employment and thus suitable utilization of the Human Resources for the constructive purpose may be ensured.

The objectives of comprehensive study of the present kind may be useful in analyzing the impact of the class room teaching on the performance of the students and also to trace the factors that are responsible for the decline of interest of the students from the class room teachings. It is to be noted here that the Government is spending money in inducing interest among the students so that they may opt the science and laboratory related courses. For example, the Indian government had initiated INSPIRE program at various levels for the students of Science related disciplines so that the bright students may opt the Science related subjects for the higher education and the bright minds may be retained in the field of Science.

III. DESCRIPTION OF THE SAMPLE

We consider attendance of the students appearing for their Post Graduation courses during four different academic sessions and we report student's percentage attendance along with the marks scored by the students in the said course/paper test. In other words, the attendance percentage of the students is reported along with the percentage of marks obtained by these students in the internal test for the said class/course/paper. It is assumed that the performance (i. e. marks obtained in the test) of the students is function of their attendance only. We calculated correlations of the performance of the students with their percentage attendance in the course/paper to see the impact of class room teachings.

The four sets (i. e. Set-I, Set-II, Set-III & Set-IV) of the data corresponds to the number of students 21, 24, 28 & 28 in the class/course/paper, respectively. The data is sown in the Table No. 1 on the attendance percentage and marks percentage of all the students.

IV. ASSUMPTIONS AND THE LIMITATIONS

We assume that student's performance is influenced by their attendance in the class. A sincere student is supposed to secure better percentage of marks than the students often found absent from their classes. Here, the sincerity is quantified in terms of the percentage attendance of the students in the class. If a student is securing marks percentage greater than or equal to 75% of the maximum marks in the test, then he/she is declared passed in the First Division with distinction. If a student is securing less than 75% marks but greater than or equal to 60% of the maximum marks, then the student is declared passed in the First Division. Those students are declared passed in Second Division who obtained marks less than 60% but greater than or equal to 45% of the maximum marks. However, Third Division corresponds to marks obtained by the students either greater than or equal to 36% of the maximum marks but less than 45% of the maximum marks. Those students are declared fail who obtained less than 36% of the maximum marks assigned for the course/paper test. The nature of the correlations of the attendance of the students in the course/paper to the marks obtained in the course/paper test by these students may vary from a paper/course to another paper/course for the same Set of the students.

There is principal limitation that the academic institutions never maintain attendance and performance related data of the students for the archival purpose. Therefore, archival data are not available for the present study. A comprehensive study of the present kind requires detailed demographic information of the students. The information may be academic as well as non academic in the nature; and the correlation of each variable/factor with the secured percentage of the marks by the students may reveal the cause of the poor performance of the students, and also such study may be relevant to trace the cause of decline of interest of the youth from the Science/laboratory related courses.

These data (i. e. Set-I, Set-II, Set-III & Set-IV) are also limited in respect to the number of students admitted to the laboratory/demonstration related courses/papers/subjects. Therefore, the small size data (i. e. small number of students in the class/course/paper) is available for the present analysis. Since, the number of the factors that may influence the performance of the students may be several therefore; the large size of the data (i. e. adequate number of enrolled students in the course/paper) even may not be useful to reach any definite conclusion with similar studies.

The data collected through survey for the small number of the students for the laboratory related courses may not be suitable for similar studies and therefore, survey may not fulfill the purpose of the study. However, the data maintained by the academic institutions about the merit (percentage of marks) of students for their admission to the courses and the performance of the students at various levels (i. e. in the elementary classes and other higher

courses/degrees related classes) may be the key factors in understanding to the reason(s) of good/poor performance of the students at the academic institutions.

V. RESULTS AND THE CONCLUSIONS

The percentage of marks obtained by the students is shown in Table No. (1) for four different academic sessions along with the percentage of attendance of the corresponding students. The results of the main examinations of these students for the said course/paper had been declared already by the institution and hence the data is accessible for the study. The correlations in between the percentage attendance and the percentage of the marks obtained by the students are calculated for four different sets (i. e. Set-I, Set-II, Set-III and Set-IV) using the standard methods of statistics[1]. The results for the data Set-I is shown using Figure Nos. 1(A) & 1(B); for data Set-II, it is shown in the Figure Nos. 2(A) & 2(B); for the data Set-III, it is shown using the Figure Nos. 3(A) & 3(B), while the results for the data Set-IV had been shown using the Figure Nos. 4(A) and 4(B).

It has been found from results of the data Set-I that the attendance percentage of the students is nicely correlated with the percentage of marks obtained by the students in the internal test of the paper/course (as shown in Figure No. 1(A)). The correlation coefficient (i. e. CC) is 0.66 and linear regression coefficient (i. e. RC) for the data of the Set-I is 0.507. The data Set (I) is highly correlated[1] with positive coefficient.

It is also found from the data Set-I (as shown in the Table No.1 and Table No. 2) that 52.38% students passed in the First Division and out of these students 33.33% of the total number of students passed with distinction. There is 33.33% of the total number of the students of the Set/class passed in Second Division, while 9.52% students passed in Third Division in the internal test of the course/paper.

The correlations for the data Set-II for the secured marks percentage to their attendance percentage is shown in the Figure No. 2(A). It is seen that the correlation coefficient (i. e. CC) for the data Set-II is 0.4361 and the data Set-II has linear regression coefficient (RC) 0.4876. Thus, the data Set (II) is moderately[1] correlated with positive coefficient. The pass percentage of the students for Set-(II) is shown in the Figure No. 2(B). There is relatively poor quantitative correlations of the data Set-II in comparison to the data Set-I. In this case, 83.33% of total students (i.e. of the data Set-II) passed in the First Division and out of them 45.83% students passed with Distinction. The percentage of the students passed in the Second Division is 12.48%, while only 4.16% students passed the test in Third Division.

The poor quantitative correlation coefficient (CC) of the data Set-(II) with respect to the data Set-I is found, while there is better pass percentage of the students in the First Division, i. e. for the data Set (II) in comparison to the data Set-(I) suggests that there are other factors influencing the performance of the students. Therefore, only a comprehensive study containing academic and non academic factors of this kind may reveal the actual factors of such difference in the pass percentage of the students for the data Set-(I) and the Set-(II). The data Set-III for the pass percentage is shown in Table No. (1&2) and it has been clearly indicated through Figure No. 3(B) and Table No. 2 that 57.14% of the students of the Set-III passed in First Division, while 32.14% students passed with distinction. There is 17.86% of the total number of students passed in Second Division, while 14.29% students passed in Third Division.

The results for the data Set-III are shown in the Figure No. 3(A) using open circle, while the pass percentage of the students is shown through Figure No. 3(B). It is found that the correlation coefficient (CC) for the data Set-III is 0.7193, while the linear regression coefficient (RC) is 0.9696. The data Set (III) is also highly[1] correlated with positive correlation coefficient.

The Set-(III) also reveals that there are other factors influencing the pass percentage of the students and a comprehensive study may only reveal the actual reason(s) of deviation (in comparison to data Sets-I and II) in the performance of the students in the class test. In other words, the students performance is affected not only by their attendance in the class but also there are other factors responsible for it, and that the academic factors are to be included in the similar studies to understand the actual reason of deviation in the performance of the students. In the data Set-(III) one student left the course in between the session as the student was selected for a professional-course.

Finally, the correlations of the data Set-IV is shown in the Figure No. 4(A) using open circle, and the data Set-IV has correlation coefficient (CC) equal to 0.6538, while the linear regression coefficient (RC) is 0.8527. The performance of the students is highly[1] correlated to the attendance of the students. The attendance of the students is positively correlated with their performance (i. e. marks obtained by the students in the class test). The pass percentage of the students is shown in the Figure 4(B).

There are 67.86% of the total numbers of the students (as shown in the data Set-IV) passed in the First Division and 42.86% of all the students of the Set-IV passed in First Division with distinction. The 21.43% of the number of students passed with Second Division, while 10.71% students passed in Third Division. The data Set-II and the data Set-IV correspond to different kind where none scored marks less than 36% of the maximum marks in the internal test of the course/paper.

A table for the comparison of the performance of the students is shown (i e. in the table No. 2 the pass percentage of the students for the four sets of the data are given for the clarity) to see that the correlations of the student's attendance with their obtained percentage of the marks. It is to be noted here that the marks obtained by the students in the class is assumed to depend on their attendance in the class. However, there are various other factors of academic and non academic in nature that may influence student's performance (i. e. marks obtained by the students in the internal test of the course/paper).

It is to be also noted here that the attendance of the students is ranging from 14.29 to 92.86 percent and the performance (i. e. marks obtained in the course/paper test) is ranging from 28 to 96 percent for the data Set-I, for the Set-II the attendance of the students is ranging from 47.06 to 94.12 percent while the performance is ranging from 44 to 92 percent, the attendance percentage for the Set-III is ranging from 18.75 to 87.50 but the performance is ranging from 04 to 80 percent, and finally in the case of the data Set-IV, the attendance percentage is ranging from 33.33 to 83.33, while the performance of the students is ranging from 36 to 84 percent.

It is to be noted here further that the academic institutions never publish attendance of the students and the marks obtained for the courses/subjects. It may not be possible for the academic institutions to do so because of the large number of courses and very large number of students registered to these courses/subjects. However, availability of the academic factors related data may be the key factors to access/learn interest of the students regarding various courses/subjects.

A survey to collect data on non academic factors for such study may not be suitable to judge the importance of the correlations as the data collected may not be accurate or the information provided by the students may not be reliable to trace the factors affecting the performance of the students. In other words, the non academic factors related to the survey may not be suitable, as the information gathered through the survey may not be accurate or reliable as the number of students in the laboratory based courses is small, and therefore, the data of the survey may affect the study in the complex manner. The academic factors that are defined by the institution may be accurate and therefore, the academic factors may be accounted for the comprehensive study of this kind.

It is clear that there are courses/subjects in which the attendance of the students may not be relevant (i. e. subjects/courses of distance education modes) but in the Science, Engineering and other similar disciplines in which attendance of the students in the class/lectures are crucial in the training of the students. The courses of demonstrative in nature and the courses on practical subjects may show positive correlation in between the attendance and the marks/performance of the students. It is also to be noted that the teacher is known to teach students not only the materials/contents mentioned in the reference/text books but also the teacher shares his/her experience and therefore, the attendance of the students in the class should be an important factor, hence the attendance must be included in such studies/reports.

The academic institutions are run by the Government on the expense of huge money and also there is involvement of enough infrastructures; and therefore, the academic institutions are supposed to play vital role in shaping the minds of the youth to prepare the Human resources of the country for the prosperity of the country. The performance of the students are decided by the number of key factors and the attendance of the students in their class/courses for the practical subjects/demonstration related courses are taken into consideration to show that the performance of the students are highly correlated (or moderately correlated with positive coefficients) with the performance of the students. Therefore, academic institutions should take stern initiatives to ensure good attendance percentage of the students in the courses/papers/subjects. The study of this kind containing factors of academic in nature must be incorporated to understand reason of decline of interest of the students in the various courses to handle problem of unemployment.

Note: This research did not receive any specific grant from any funding agency.

Table No. 1: The four sets of data on the marks obtained and the student's attendance for the course/paper are shown in the following table. The attendance of the students and the marks obtained by them are reported in the percentage.

Set-I		Set-II		Set-III		Set-IV	
% Attendance	% of marks obtained	% Attendance	% of marks obtained	% Attendance	% of marks obtained	% Attendance	% of marks obtained
71.43	84	82.35	88	56.25	64	72.22	64
92.86	76	88.24	84	68.75	68	83.33	76
78.57	80	88.24	80	56.25	48	72.22	84
71.43	72	76.47	80	68.75	76	72.22	84
71.43	64	47.06	60	68.75	64	77.78	84
71.43	76	88.24	68	43.75	52	77.78	80
78.57	64	94.12	80	81.25	76	77.78	76
57.14	56	70.59	52	68.75	80	72.22	84
64.29	56	82.35	44	87.50	76	72.22	80
42.86	28	82.35	72	75.00	76	61.11	56
21.43	44	76.47	72	68.75	76	66.67	72
14.29	48	82.35	84	62.50	64	66.67	76
35.71	36	70.59	52	62.50	52	77.78	84
85.71	48	70.59	56	68.75	80	55.56	72
92.86	76	70.59	72	68.75	76	66.67	56
78.57	92	94.12	72	18.75	32	72.22	80
71.43	52	94.12	80	56.25	56	66.67	36
85.71	96	76.47	72	62.50	68	77.78	76
50.00	64	94.12	80	62.50	64	61.11	48
64.29	52	94.12	60	62.50	68	61.11	44
21.43	52	70.59	68	68.75	80	72.22	72
		88.24	80	31.25	48	50.00	40
		76.47	84	50.00	32	55.56	48
		88.24	92	50.00	40	55.56	64
				56.25	36	44.45	56
				50.00	04	66.67	72
				50.00	40	72.22	64
				56.25	44	33.33	52

Table No. 2: The pass percentage of the students is shown in the following table for above said four sets of the data.

Data Set Type	Division	Pass Percentage (with distinction)
Set-I CC= 0.6633 (High)[1] RC=0.507	1st	52.38 (33.33)
	2nd	33.33
	3rd	9.52
Set-II CC=0.4361(Moderate)[1] RC= 0.4876	1st	83.33 (45.83)
	2nd	12.48
	3rd	4.16
Set-III CC=0.7193 (High)[1] RC= 0.9696	1st	57.14 (32.14)
	2nd	17.86
	3rd	14.29
Set-IV CC= 0.6538 (High)[1] RC= 0.8527	1st	67.86 (42.86)
	2nd	21.43
	3rd	10.71

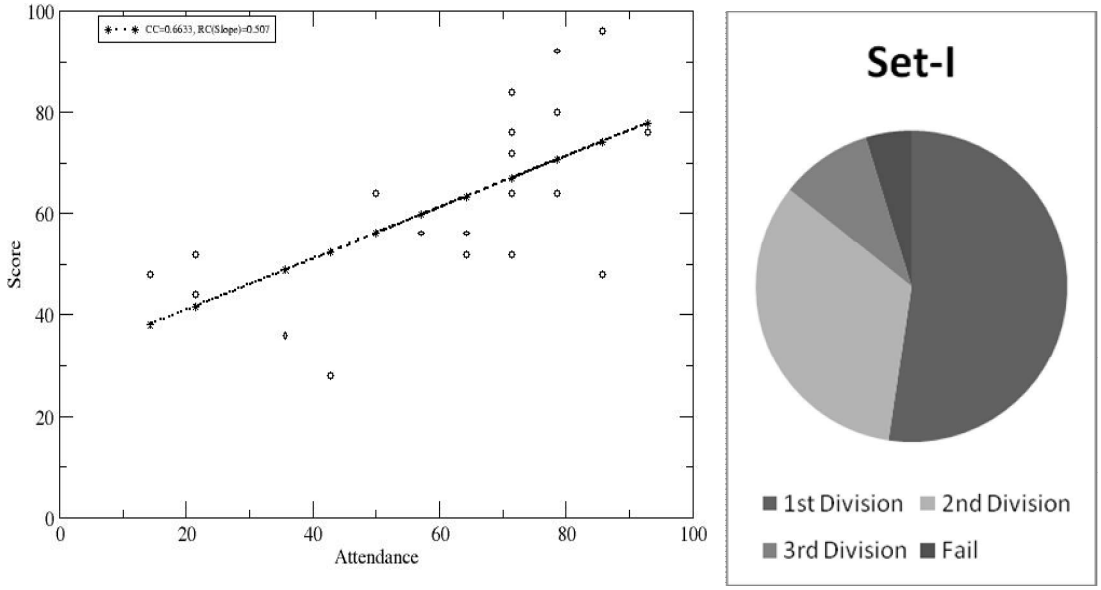
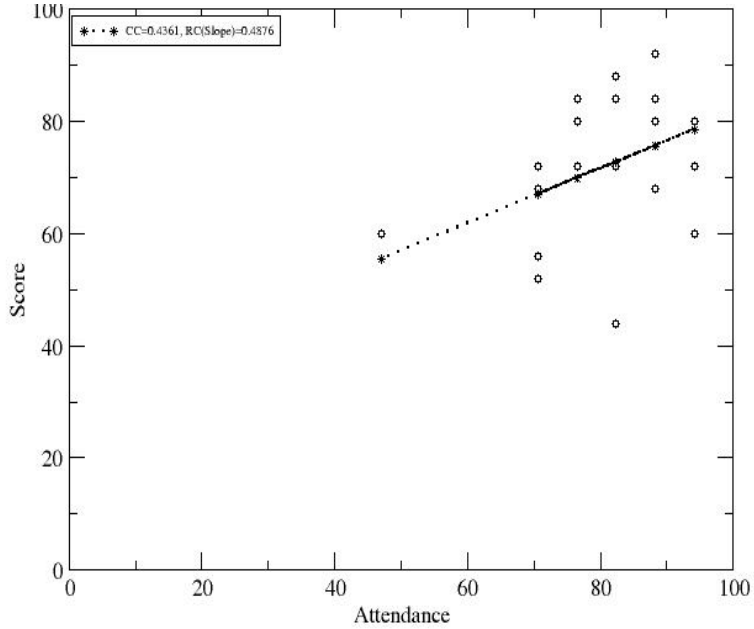


Figure No. 1: The scaled data of the attendance and the marks of the students for the data Set-I had been shown using open circle in the Figure No. 1(A). These data scaled linearly and the correlation coefficient (CC) has value 0.6633, while the value of regression coefficient (RC) is 0.507 for this Set. The pass percentage of the students is shown in Figure No. 1(B), where, 52.38% students passed in First Division, 33.33% percent students passed in Second Division and 9.52% students passed in Third Division.



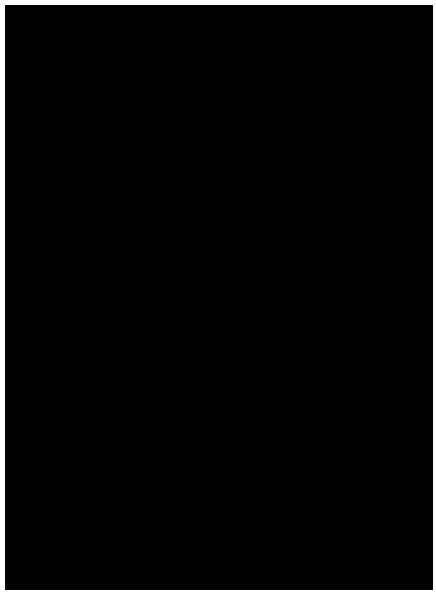


Figure No. 2(A) Figure No. 2(B)

Figure No. 2: The scaled data (i.e. of the data set-II) for the attendance of the students and the marks obtained by these students are shown using open circle in the Figure No. 2(A). These data points scaled linearly and the correlation coefficient (CC) has value 0.4361, while the value of regression coefficient (RC) is 0.4876. The pass percentage of these students is shown in the Figure No. 2(B). There are 83.33% students passed in the First Division, 12.48% passed in Second Division and 4.16% students passed in Third Division. It is to be noted here that all the students of the data Set (II) secured marks percentage greater than 36% of the maximum marks.

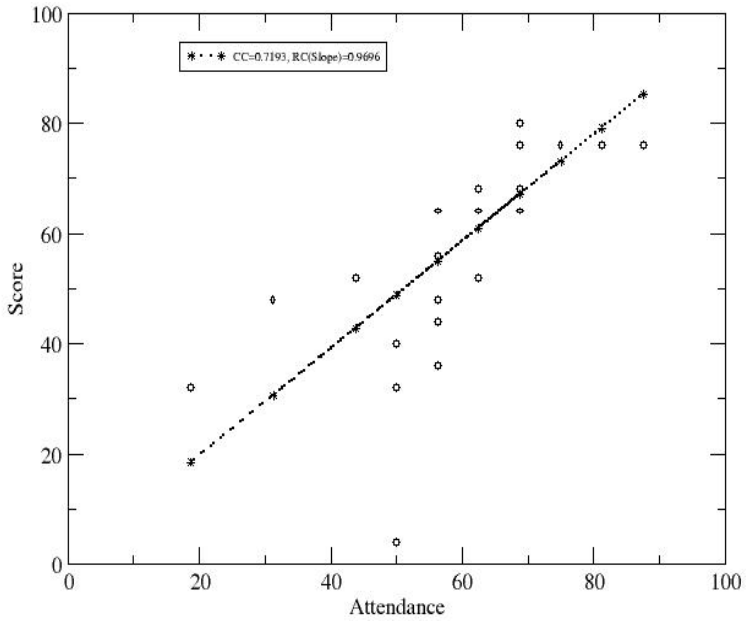


Figure No. 3(A)

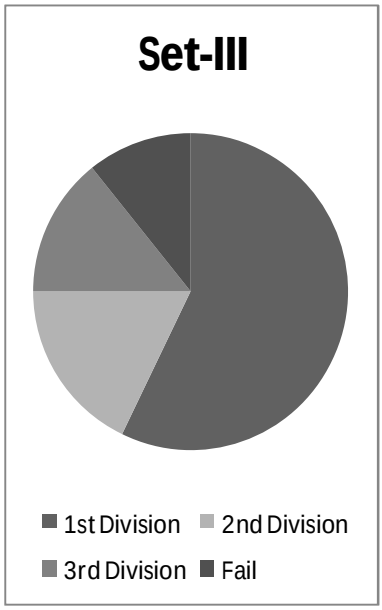


Figure No. 3(B)

Figure No. 3: The scaled data of the attendance percentage and the marks percentage by the students for the data Set-III had been shown by the open circles in the Figure No. 3(A). The data is scaled linearly and the correlation coefficient (CC) has value 0.7193, while the value of regression coefficient (RC) is 0.9696. The pass percentage of the students for the Set-III is shown in the Figure No. 3(B). There are 57.14% students in numbers who passed in First Division, 17.86% students passed in Second Division and 14.29% students passed in Third Division.

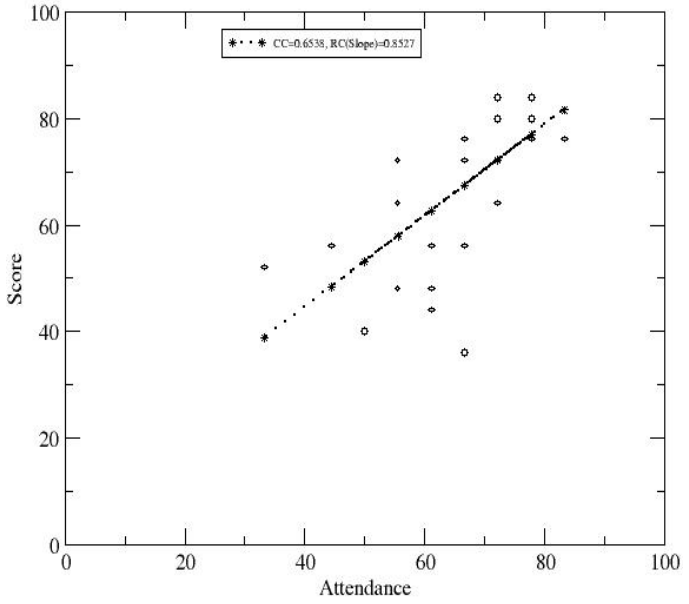


Figure No. 4(A)

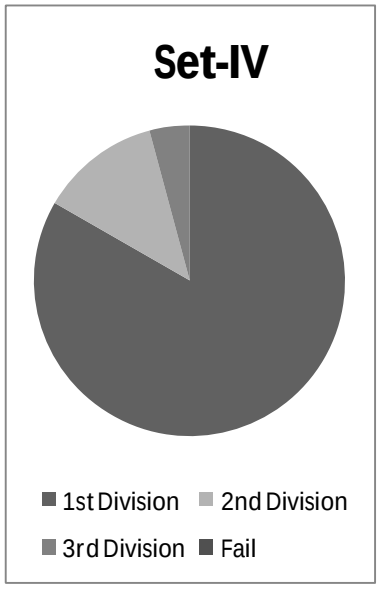


Figure No. 4(B)

Figure No. 4: The scaled data of the attendance and the marks percentage obtained by the students for the set-IV is shown using open circles in Figure No. 4(A). These data scaled linearly and the correlation coefficient (CC) is 0.6538, while the value of regression coefficient (RC) is 0.8527. The pass percentage of the students for the Set-IV is shown in the Figure No. 4(B). It is found that none scored less than 36% of the maximum marks. For this data set, 67.86% students passed in First Division, 21.43% students passed in Second Division and 10.71% students passed in Third Division.

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