



STATSPACE-4

2019-2020

*Celebrating 100th Birthday of
Prof. C.R. Rao*



Sigma Club

Department of Statistics

St. Ann's College for Women

(Autonomous), Affiliated to Osmania University
Re-accredited with 'A+' Grade by NAAC (3rd Cycle),
College with Potential for Excellence by UGC
Mehdipatnam, Hyderabad -500 028





Principal's Message



Dr. Sr. P. Amrutha (Principal)

*“I congratulate the Department of Statistics on the release of the fourth issue of **Stat-Space**, wishing them all the best and hope this issue will serve as a good source of knowledge and will go a long way in serving the student community and society to a large extent.”*

Education is the passport to the future, for tomorrow belongs to those who prepare for it today -Malcom-X



Sigma Club

The constant thought of having a common place to interact, was so entrenched in the young minds that a club has been launched under the department, named *SIGMA*. The name of the club come from the most striking feature of Statistics; Study of Variation denoted by ' σ '.

The club took its original form on 10th September 2016 as an encomium to-*THE LIVING LEGEND OF STATISTICS- PROFESSOR C.R. RAO*, marking his 96th birthday.

CLUB OBJECTIVES:

Bridging the gap by conducting workshops and conferences.

Learning by fun through presenting facts and figures

Having an open platform to share ideas

*Publishing **STATSPACE** magazine*

Tell me and I forget, teach me and I may remember, involve me and I learn." Benjamin Franklin



Department of Statistics

Report 2019-2020

Events Organized at Faculty level

National Colloquium: Commemorating the birth centenary celebrations of the doyen in the subject of Statistics, Prof C.R.Rao, the Department of Statistics in collaboration with C.R. Rao AIMSCS, UoH Campus organized a one day ***National Colloquium on Works of Living Legend Prof C.R.Rao*** on 26th September 2019 in Seminar Hall II (A.V.Room).

Chief Guest: Dr.D.N. Reddy, Director, C.R.Rao AIMSCS

Keynote Speaker: Prof.B.L.S. Prakasha Rao, INSA Senior Scientist, C.R.Rao AIMSCS.

Title of the talk: C.R Rao: A Life in Statistics.

Special Guests: Dr. C. Jayalakshmi, Prof., B.O.S Chair person, Department of Statistics, Osmania University Dr. G. Jayasree, Head, Department of Statistics, Osmania University.

Invited Talk(Webcast) :Ms D.Harini, Senior Manager, Process Quality and Reliability Department, TATA Motors Ltd.

Title of the talk: Future oriented Statistics

Facts are stubborn things, but statistics is Pliable -Mark Twain

Student Activities

The Department of Statistics organized a session of lectures on *Orientation & Career Prospects in the subject of Statistics* for B.Sc.(MSCS)- I & II year students on 11th July 2019 in Seminar Hall II(A.V.Room).

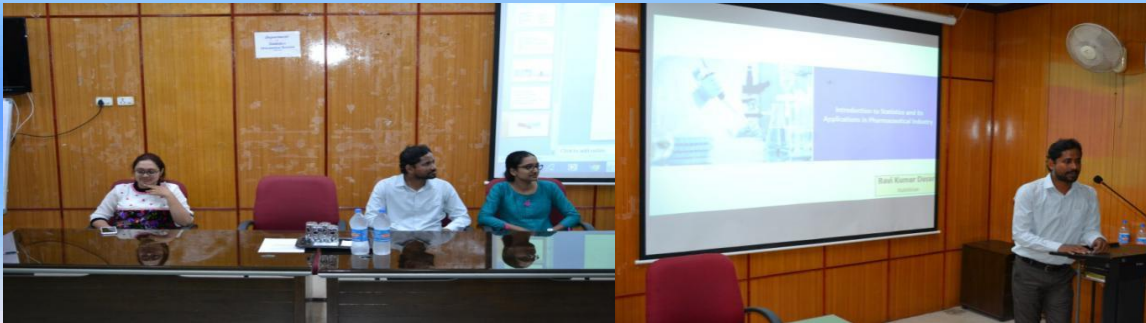
The speakers were

Mr.Ravi Dasari, Statistician, Dr.Reddy's Laboratories, Hyderabad

Ms.Saroja Devi, Ph.D Scholar, CESS (ICSSR Fellow), Hyderabad

Ms.Sreelekha Valli, Associate Data Analyst, Jocata Financial Advisory, Hyderabad

Ms.S.Nirusha, M.B.A (Business Analytics) – I year, UoH, Hyderabad.



In National Colloquium following intercollegiate Competitions were conducted for students

- Stat-Rhyme - 10
- Random Bits- Poster Competition Topic: Works on Prof.C.R.Rao - 14
- Debate (Team of 2) - 5
- Catchy Slogan - 15
- Brain Teaser - 11



We must be careful not to confuse data with the abstractions we use analyze them-William Janes

B.Sc.(MSCs) II year students on 23rd September 2019 in the Seminar Hall II (A.V.Room). The speaker was K. Parimala Diana Sudhir Associate Professor & HOD, Statistics Aurora's Degree & PG College.



The department of Statistics organized an Orientation Session on volunteerism, activities chiguru event of Youth for Seva (YFS) for B.Sc. (MSCS) I & II year students on 11th December 2019 in Seminar Hall II (A.V.Room).



Statistics are the only tools by which an opening can be cut through the formidable thicket of difficulties that bars the path of those who pursue the

Students from the Department of statistics under the Non – Governmental Organization *Youth For Seva* has volunteered in many community based activities around the year .

Date-Time-Venue	Event	Target Group
15 th December 2019 Time: 7.00 am – 5 pm Venue: Pallavi International School Gandipet, Hyderabad	Chiguru Event – Kids Carnival organized by YFS.	60 Students from B.Sc.(MSCS) I, II & III year
25th January 2020 Time: 9.30 am Venue: Seminar Hall II(A.V.Room)	Training Session on Menstrual Hygiene Awareness (MHA) program conducted by YFS & ; SUVIDHA initiative of Mamatha Trust Infosys	Selected students of B.Sc.(MSCS) I, II & III year students.
31th January 2020 Time: 10 am – 2:30 pm Venue: Government High School, Shaikpet.	Conducted Awareness Program about Menstrual Hygiene Management (MHM) in collaboration with SUVIDHA initiative of Mamatha Trust-Infosys and YFS.	Selected students of B.Sc.(MSCS) I, II III year students.
8 February 2020 Time- 8:30 am- 5:30 pm Venue- The Atria, Ascenda IT Park, Hitech City	Enable Event- Specially Abled kids Carnival organized by YFS.	51 Students from B.Sc. (MSCS) I, II III year.



National Colloquium

The year 2019 marks the 100th year in the life of *Prof. C.R Rao*, a Giant statistician and a recipient of many prestigious awards and so it is a significant year for the statisticians around the world. Remembering the living legend and his contributions to the subject and the society, the *SIGMA CLUB* under the department of Statistics, St Ann's college for women in collaboration with CR RAO Institute has taken an initiative to organize a National level colloquium on Works of a Giant statistician CR RAO on 26 Sept 2019. The colloquium was attended by students, research scholars, faculties from many colleges across Hyderabad.



The key-note address was delivered by Prof B.L.S Prakasha Rao, winner of the eminent Shanti-Swarup Bhatnagar award, Ramanujan chairperson-CR RAO AIMSCs, Hyderabad on the topic "*CR-RAO :LIFE IN STATISTICS*".

Statistics is the science, technology and art of developing human knowledge through the use of empirical data -C.R Rao

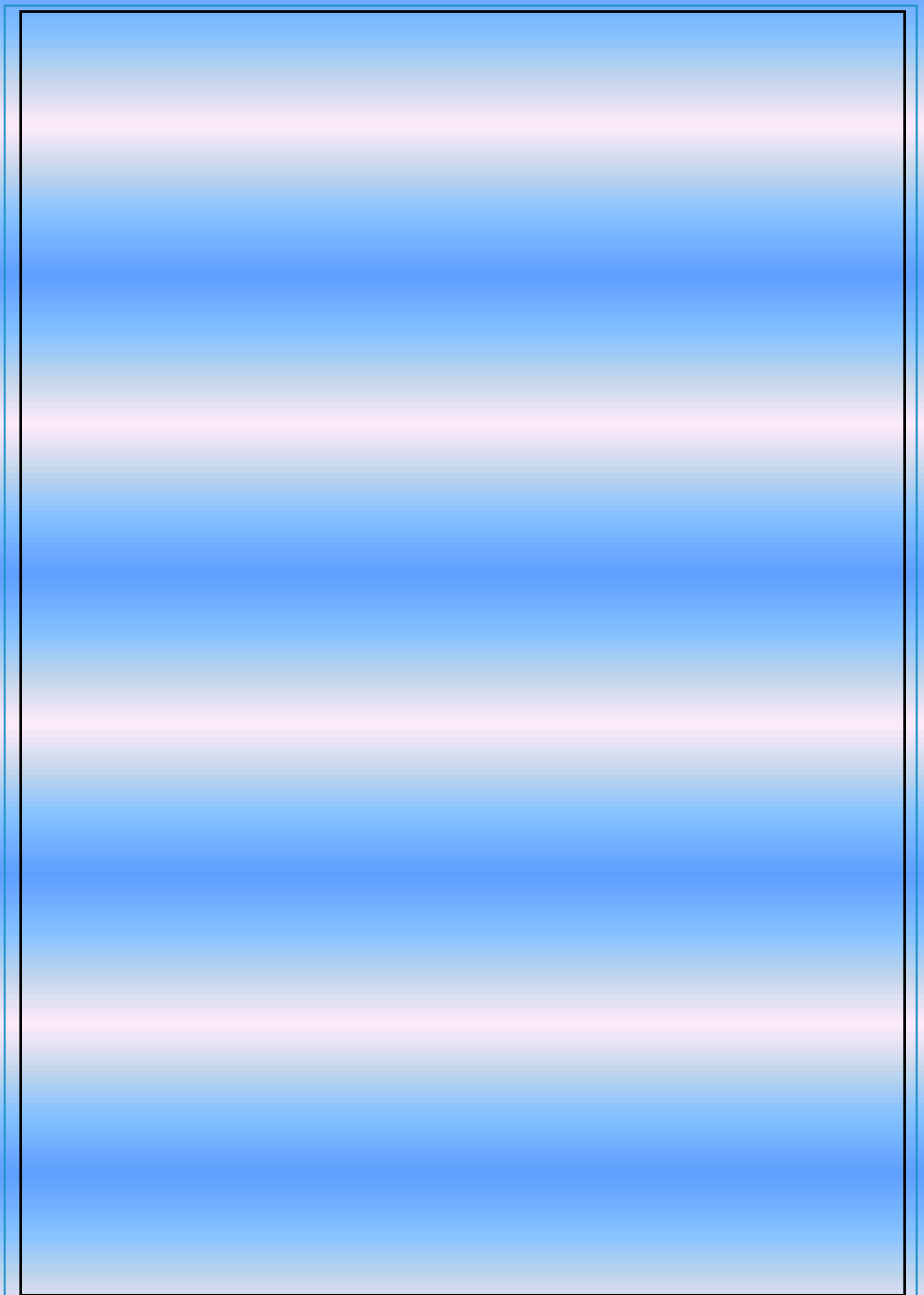
Prizes were presented under cash prizes sponsored by CR Rao AIMSCS. The colloquium helped the students, upcoming statisticians to get deeper insights into the works of Prof CR RAO and motivated many students to pursue their career in statistics.

In National Colloquium following intercollegiate Competitions were conducted for students

- Stat-Rhyme
- Random Bits
On Works of
Prof.C.R.Rao
- Debating
(Team of 2)
- Catchy Slogan
- Brain Teaser



It is a capital mistake to theorize before one has data-Sir Arthur Doyle



Prof. C.R Rao



A statistician by chance, Prof. Calyampudi Radhakrishna Rao is one of the sunniest luminaries in the galaxy of Indian scientists. This centenarian is a recipient of numerous National and International Awards.

His research, scholarship, and professional services have had a profound influence on theory and applications of statistics.

For example, His research in multivariate analysis, is useful in economic planning, weather prediction, medical diagnosis, tracking the movements of spy planes, monitoring the movements of spacecrafts etc.

Technical terms bearing his name appear in all standard textbooks on statistics, econometrics, biometrics, and engineering.

Examples of these terms are the Cramer-Rao Inequality, Rao-Blackwellization, Fisher-Rao Theorem, Rao Distance, Rao's Orthogonal Arrays, Multivariate Analysis of Variance, Canonical Variate Analysis and Generalized Inverse of matrices etc.

He received 33 Honorary Doctoral Degrees from Universities of 18 countries spanning 6 continents.

He is the author of 14 books and has about 447 research papers published in high impact journals. Three of his books have been translated into several European, Chinese, and Japanese languages.

Former US president George W Bush described Prof C R Rao as the "Prophet of a New Age" in a citation while presenting him the President's Medal, the country's highest award to a scientist in 2003.

C. R. Rao was born on 10th September in the year 1920 in HuvannaHadagali, now in Karnataka State, in the southern part of India. This Giant statistician benefited a lot from his mother's discipline and his father, encouraging him to solve mathematical problems. With a BA Degree in Mathematics, in the year 1940, Rao who wanted to work in North Africa, reached Kolkata for the Interview, but somehow ended up meeting Mr. Subramanian, who was undertaking training at the Indian Statistical Institute, Kolkata. Rao got so influenced by the conversation with him, that he also undertook a course at ISI. This was the instance of Rao getting into the field of Statistics and there was no looking back.

In this way, the young man stayed for 40 years in Kolkata. After getting his M. A. Degree in statistics from Calcutta University, he worked there as a research scholar, superintending statistician, professor and head of Research and Training School, later (after the death of the father of Indian Statistics- P.C. (Mahalanobis), he became the Director of the Indian Statistical Institute, worked as a professor in National Universities like Jawaharlal Nehru University, before he took mandatory retirement at the age of 60. He earned his Ph.D. in the year 1948 from Cambridge University under the supervision of Sir R. A. Fisher, founder of modern statistics, he was the only Ph.D. student of R.A. Fisher.

A few years later, in 1965, the Cambridge University awarded him the prestigious higher doctorate Sc.D. degree based on a peer review of his research contributions to Statistics.





Articles by Students

Statistical analysis of factors affecting student academic performance

INTRODUCTION:

Without students the college will be only just a “building”. Students are most essential asset for any educational institute. The academic performance of students determines the future goals and objectives of students what subjects they will specialize in colleges and universities, which educational institutions they’ll get enrolled into, what career opportunities they would take up and so forth. The determinants of academic performance of the students include how well a student participates in the class, student response towards the assignments, how often they do their home works, regularity to the class, performance in exams and participation in competitions and other events.

STUDENT BACKGROUND: Students’ family income and parents’ education are significantly related with student performance and they are highly interconnected with the student academic performance. Students’ living location, community, medium of teaching, parents’ qualification’s, students’ habits, family’s financial status are very much correlated with the students’ academic performance.

ATTITUDE OF STUDENT: Students possess abilities to differentiate between what is appropriate and what is

inappropriate. Goal-oriented students usually possess positive feelings regarding their experiences, the traits of discipline, diligence and resourcefulness. The attitude of students and determination towards their studies is directly proportional to the student academic performance. Student academic performance also depend on how well the students use the resources provided to them such as textbooks, notes, learning materials, hand-outs, technology, library facilities and laboratory facilities. When students will be provided the necessary and essential tools and equipment, they will be acquire a better understanding regarding the academic concepts.

FACULTY SUPPORT: Teachers have an imperative role in influencing the academic performance of the students. They are bestowed with the authority to direct all the classroom activities and administer learning. They need to possess an approachable nature, listen and provide solutions to the problems experienced by the students. They should possess adequate knowledge and information regarding the subjects that they are teaching, usage of technology, modern and innovative methods in the teaching and learning processes, managing discipline and directing all of the classroom as well as school activities and functions in a well-organized manner.

CLASS ROOM ENVIRONMENT: The academic concepts are made known to the students by the teachers within classroom. Teachers have the main job duty of completing the subject syllabus. Therefore, it is vital that classroom environment should be disciplined, and well-ordered. When there is discipline and effective communication among the individuals, then it would help the students learn better and improve their academic performance.

HOME ENVIRONMENT: Home is referred to as the place from where the foundation of learning and education takes place. In order to produce good academic outcomes, it is vital for the parents, children and other family members to encourage a learning atmosphere within homes. Parents play an important role in leading to operative growth and development of their children. In schools, whatever problems that children go through regarding academics and other areas, they normally communicate to their parents. Parents are sources of security, encouragement and help their children in providing solutions to their problems.

SOCIAL CIRCLE: Children get enrolled in schools not only to learn academic concepts, but they also learn, how to interact and socialize with others. Students usually form friendly terms and relationships with the fellow students. Forming a social circle and friendships have a positive effect upon the academic

outcomes of the students. As when one has to work on a project or prepare for a test, then group study is in most cases beneficial. It also causes social satisfaction and happiness in one's student life.

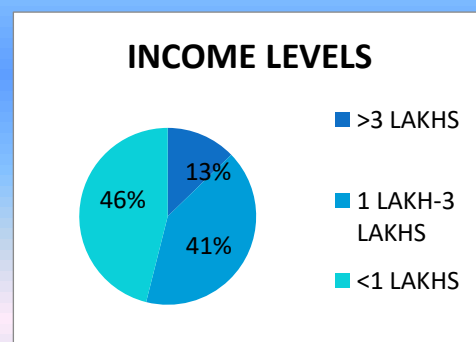
MATERIALS AND METHODS:

Selection of sample: A cross-sectional survey was conducted for the students of B.Sc(Mathematics) in St. Ann's College, Mehdipatnam and Hyderabad. A total of 102 students were included in the study.

STATISTICAL ANALYSISThe data collected has been compiled into Excel worksheets by making relevant columns for the analysis of the data. The analyses were done using correlation.

RESULTS AND DISCUSSION:In the present study out of 102 subjects, the Correlation between the CGPA of Degree 1st year and the percentage in the Intermediate was found. Correlation Coefficient is 0.62.

Income levels:The number of subjects with parent's income level >3lakhs are 13(13%), 1 lakh-3lakhs is 42(42%), <1lakhs is 47(46%) as shown in Figure 1.



Father's qualification: Subjects whose Father's are Post Graduates 6(5%), Under Graduates 25(24%), Intermediate 24(24%), SSC 34(33%) and Uneducated 14(14%) are shown in Figure 2.

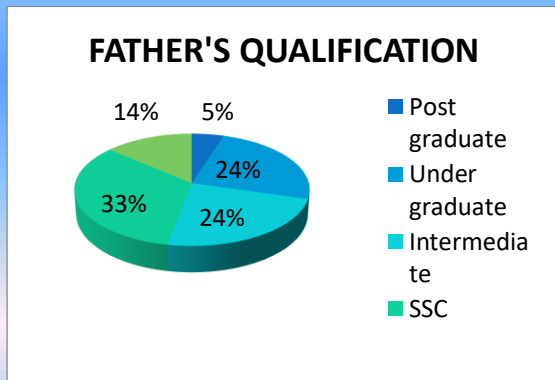


figure 2

Mother's Qualification : Subjects whose mother's are Post Graduates is 8(8%), Under Graduates is 16(16%), Intermediate is 15(15%), SSC is 40(39%), Uneducated are 23(22%) as shown in Figure 3.

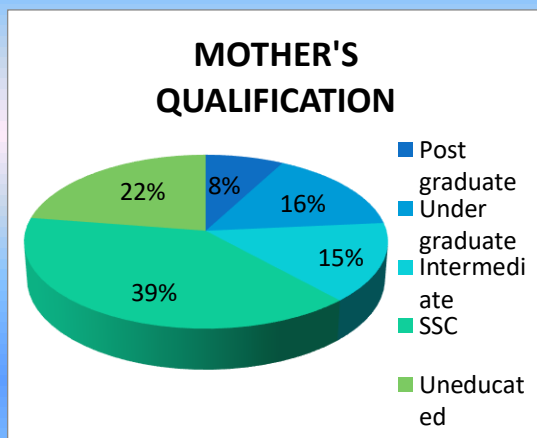


Figure 3

Father's Occupation: Subjects whose father's are Government Employee is 14(14%), Private Employee is 27(25%), Business is 61(61%) as shown in Figure 4.

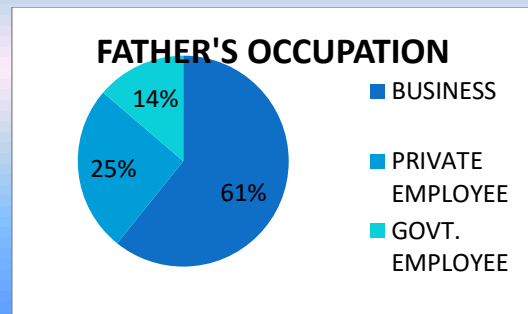


Figure 4

Mother's Occupation: Subjects whose mother's are Home Makers is 89(87%), Employed are 9(9%), Business are 4(4%) as shown in Figure 5.

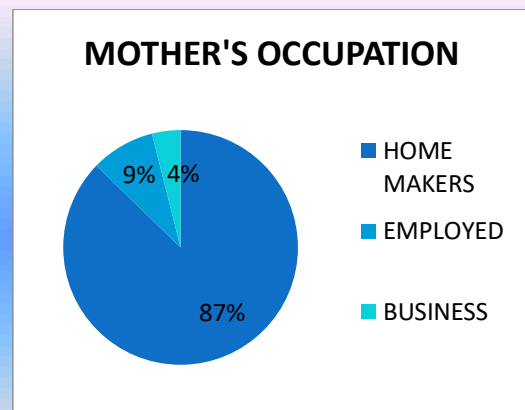


Figure 5

CONCLUSION : In recent years, there was a growing debate on the factors affecting students' academic performance.

The correlation Coefficient is 0.62. This value indicates moderate positive linear relationship between CGPA of Degree 1st year and the percentage in the Intermediate.

- Abhinaya Reddy
Neha
BSc-MSCS 2nd Year

Statistical Overview of pattern of Corona virus in South Indian

Abstract

Corona virus disease of 2019 (COVID - 19) is the disease caused by acute respiratory issues. It was first identified in December 2019 in Wuhan, China and has since spread globally resulting in an ongoing pandemic. India's swift action, emerging policy making emergency investment in health care has been widely appreciated. Some of the states like Maharashtra, Delhi, Gujarat have been affected badly while other states like Kerala have performed exceedingly well in controlling the spread of virus. Though India is the country with second largest population with much diversity, in socio-economic conditions, it is able to control the spread of the epidemic better than many developed countries and is being appreciated by WHO. The occurrences of cases is very erratic in nature and spreads in a very unpredictable manner. Hence, for predictions and estimations, advanced statistical methods with a mix of mathematical models need to be employed and such analysis is beyond the scope. Hence, Simple percentage analysis and comparisons have been drawn between the five Southern States of India – Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Telangana State.

Keywords: COVID 19, case fatality rate, pandemic

Introduction

Corona virus disease of 2019 (COVID - 19) is the disease caused by acute respiratory issues. It was first identified in December 2019 in Wuhan, China and has since spread globally resulting in an ongoing pandemic. As on May 9th 2020 more than 3.95 million cases have been reported across 187 countries resulting in more than 2,75,000 deaths. The virus is primarily spread between people during close contact, often via small droplets produced by coughing, sneezing and talking. People may also become infected by touching a contaminated surface and then touching their faces.

Recommended measures to prevent the infection include frequent hand washing, maintaining physical distance from others, quarantine and keeping unwashed hands away from our faces. **World Health Organization (WHO)** declared the COVID 19 outbreak as pandemic on 11th March 2020 since, local transmission of the disease has occurred in most countries across all the continents.

The first case in India was reported on 30th January 2020 in Kerala, and as on 9th May 2020 India has 59600 cases and 1981 deaths. India has suspended all tourist visas. On 24th March the central government ordered a national lockdown for 21 days affecting the entire 1.378 billion population of India. On 14th April the Prime Minister has extended the ongoing lockdown till 3rd May. The government has taken various steps to control the epidemic by increased testing creating awareness on social distancing, providing quarantine and medical

facilities. Observers state that the lockdown slowed down the growth rate of the pandemic by 6th April. The doubling rate which was 6 days in the first week of April improved to 8 days by April 18th. WHO has said that India had tremendous capacity to deal with corona virus outbreak, and as the second most populous country, India will have impact on the world's ability to deal with it.

This pandemic is now an enormous challenge for researchers, clinicians, health-care workers, epidemiologists and decision-makers. The Statistical models play a major role in fighting the panic of the information to avoid or at least mitigate the risk of the bias which is a common threat to epidemiological studies, there are several challenges that statisticians, analysts have in order to provide support in this pandemic with their expertise.

The objective of this study is to understand and measure the performance of the 5 southern states with rest of the country, we take the date of the cases till 5th of May. The data used to perform this analysis/ comparison is picked up from the Ministry of Health and Family welfare of govt in India.

Analysis and Results

The present discussion is based on publicly available data from Ministry of Health and Family Welfare (MoHFW), Government of India, Wikipedia and other

sources of the COVID 19 data. The data of five southern states of India - Kerala, Andhra Pradesh, Tamil Nadu, Telangana and Karnataka and India has been taken

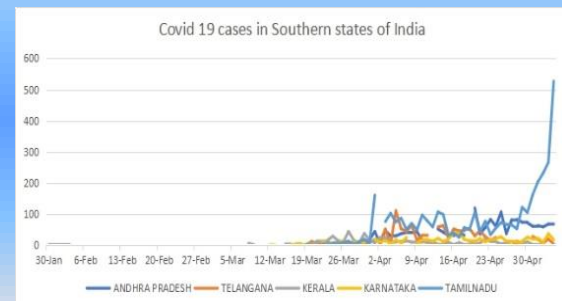


figure1

From the above graph, Figure 1 we see that, although the cases in south India have begun from 30 January 2020, the actual spread of the pandemic have started from around 26 March to 2 April, where there is a rise in the cases in the states like Andhra Pradesh and Tamil Nadu, and state like Kerala have managed to lower the number of cases. The government has taken initiatives like lockdown to mitigate the risk caused by COVID 19, the first lock down phase was scheduled from 24th March till 14th April.

The expectation of the lockdown was to cut down the contact between people and so cut down the spread of virus further. From the Figure 3 we can see that although the spread of the virus in the states have come down initially, the spread of virus leading to cases have been more in the coming days because of various reasons, the virus spread erratically.

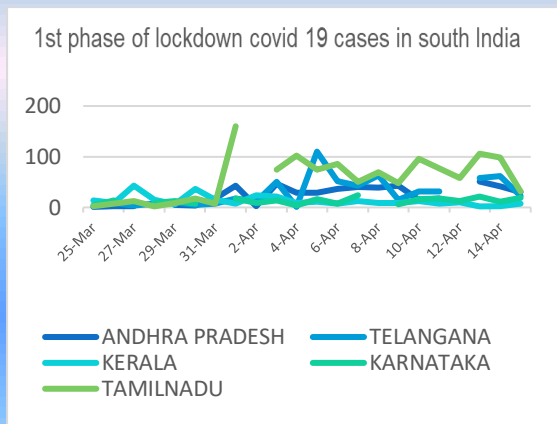


Figure 2

The second period of lockdown has shown relatively less spread of the disease and more success rate in cutting down the spread of the virus except in the states like Tamil Nadu, and we see the graph of Andhra Pradesh has been flattening.

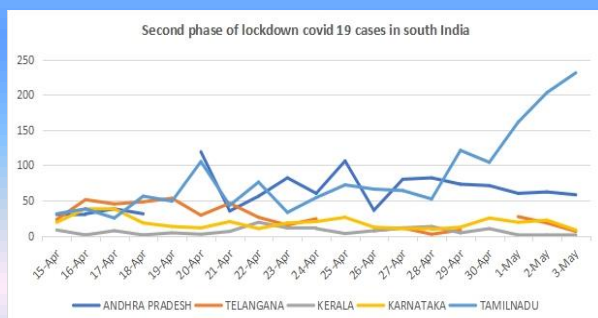


Figure 3

The percentage of COVID 19 cases in the respective Southern States is being displayed in Figure 4. It can be seen that Karnataka has very less percentage case rate with as minimum of 0.00095771%.

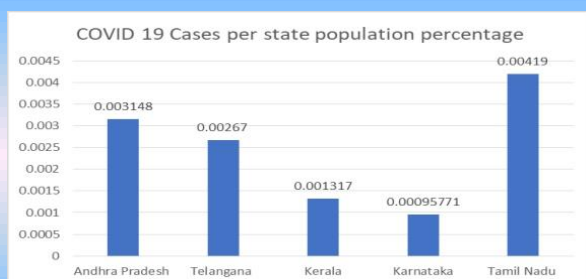


Figure 4

We see that although there are a greater number of cases in Tamil Nadu, there are

more number of cases in Andhra Pradesh followed by Telangana state.

Conclusion: The spread of the COVID 19 disease can be predicted exponentially through statistics, but the challenge arises when the pattern of the spread, occurrence of the cases, and deaths are in an erratic manner. The cause of spread could be due to various reasons beyond the statistical analysis. To understand the situation better, clustering analysis and analysis of diagggregated data need to be done, for which such data need to be available. For future safety if such data is made available, can be used to predict the reasons and pattern of occurrences in future pandemic crisis, if any. However in dispersement scenario, the spread is unknown and the potential cases may raise exponentially which would defeat the purpose of the statistical data explained above. We may also need to include the mathematical model to facilitate the study more objectively.

Challenges/ Bottlenecks – The COVID 19 which has caused massive destruction of lives and resources across the world. Various scientists, mathematicians’ and statisticians have been trying to analyze the impact of the COVID 19 across the world. It has been observed that even though statistics does throw results of the analyzed data, there are few limitations/challenges which might not present a proper prediction as it does not take into external factors like testing methodology, reporting methodology, response of the individual countries.

Y. Anjali
BSc-MSCS 2nd Year

C.R.Rao's works and their applications



Calyampudi Radhakrishna Rao, FRS known as C.R. Rao (born 10 September 1920) is an Indian –American Mathematician and Statistician .He is currently professor emeritus at Pennsylvania State University at Buffalo. C.R. Rao was the eighth of the ten children born to a Telugu family in Hadagali , Bellary, Karnataka ,India. He received an MSC in mathematics from Andhra University and an MA in statistics from Calcutta University in 1943. He obtained a PHD Degree at King's College in Cambridge University under R.A. Fisher in 1948, to which he added a Sc. Degree, also from Cambridge in 1965. Rao worked at Indian Statistical Institute and the anthropological Museum in Cambridge.

He held several important positions ,as the director of the ***Indian Statistical Institute***, Jawaharlal Nehru Professor and National professor in India, University professor at the University of Pittsburgh and Eberly professor and chair of statistics and director of the Center of multi variate analysis at Pennsylvania state university .As Head and later director of the research and training school at Indian statistical institute for a period of over 40years, Rao developed research and training programs and produced several leaders in the field of

mathematics. The American statistical association has described him as “a living legend whose work has influenced not just statistics, but has had far reaching implications for fields as varied as economics, genetics, anthropology, geology, national planning , demography ,biometry and medicine”.

The times of India listed Rao as one of the top 10 Indian scientists of all time. Rao is also a seminar policy and statistics advisor for the Indian heart association non-profit focused on raising south Asian cardiovascular disease awareness. Among his Cramer-Rao bound and the Rao-Blackwell theorem both related to the quality of estimators other areas he worked in include multivariate analysis, estimation theory and differential Geometry his other contributions include the fisher-Rao theorem, Rao distance and orthogonal arrays.

He is the author of 14 books and has published over 400 journal publications. Rao has received 38 honorary doctoral degrees from universities and numerous awards and medals for his contributions to statistics and science. He is member of eight national academies in India, the United kingdom the united states and Italy. He was honored with his 38th honorary doctorate by the Indian Institute of technology, Kharagpur on 26 July 2014 for his contributions to the foundations of modern statistics through the introduction of concepts such as Cramer-Rao inequality, Rao-black wellzation , Rao distance, Rao measure and for introducing the idea of orthogonal arrays for the industry to design high-quality products”.

He was inducted into the hall of frame of India's National Institution for quality and Reliability (Chennai branch) for his contribution to industrial statistics and the

promotion of quality control programs in industries.

role in the development of econometric research in India”.

His contributions to statistical theory and applications are well known and many of his results which bear his name are included in the curriculum of courses in statistics at bachelor's and master's level all over the world.

Dr Rao's own contributions to econometrics and acknowledge his major

Geetha Madhuri
BSc-MSCS 3rd year

World of Data

See the information you can enjoy it

Think big and big you can play with it

Additional data tells you its mean

The mode is the number most seen

Interact more and more to know its power

Seriously it has great significance, not lower

Theoretical tests always shine

Independence may not always show its sign

Correlation associates things

Statistics has got its wings

to fly and Fly until the sky

and be the superior without any barrier

G. Mahati
B.Sc. MSCS 2nd Year

A single Death is tragedy; a million deaths is a statistics- Joesph Stalin



Career prospects

Statisticians use mathematical techniques to analyze and interpret data and draw conclusions. One can find a career in statistical profession by doing activities such as solving problems in a wide variety of fields and apply mathematical and statistical knowledge to social, economic problems. Careers that incorporate statistics can be found in a wide variety of disciplines. These candidates can also apply for the Indian Statistical Services, Civil Services and Indian Economic Services exams.

Post Graduate/Diploma Courses

- Indian Statistical Institute
(M.Stat, M.Math, M.S(QMS) and few Diploma Courses.
- Chennai Mathematical Institute
(MSc-Math)
- The Institute of Mathematical Sciences, Chennai(integrated MSc-PhD)
- IITs
- Central Universities
- Courses in Cryptography
- Pune University (MSc. Statistics)
- Osmania, Madras and many other Universities
- Data Analytics Courses
- P.G/PH.D in Population studies(IIPS)
- Masters in Demography-University of Kerala
- IIPH(Masters in Public Health)
- P.G/Diplomas in Actuarial Courses
- Actuaries Courses
- Online Courses:
Coursera.org & many other websites

JOB AREAS

Census, Ecological, Medical, Election, Crime, Education, Film, Cricket, Tourism Etc.

JOB TITLES

Statisticians, Business Analyst, Mathematician, Professor, Risk Analyst, Data Analyst, Content Analyst, Statistic Trainer, Data Scientist, Consultant, Biostatistician

Public and Private Sectors

- *Actuary*
- *Data Scientists/Data Analytics*
- *Big Data Analysis*
- *Demand Analysts & HR Analysts*
- *Risk Managers*
- *Cryptographers*
- *Biostatisticians-Pharmaceutical Industries , Software Industries*
- *Financial Statisticians*
- *Demographers*
- *Data Journalism*
- *Indian Statistical Service*
- *DSIM-Reserve Bank of India*
- *Statistical Officer (SO)*
- *Textile Committee*

Fun with Statistics

1. Varun and Abhi play a game with two dice. But they do not use the numbers. Some of the faces are painted red and the others blue. Each player throws the dice in turn. Varun wins when the two top faces are the same color. Abhi wins when the colors are different. Their chances are even. The first die has 5 red faces and 1 blue face. How many red and how many blue are there on the second die?



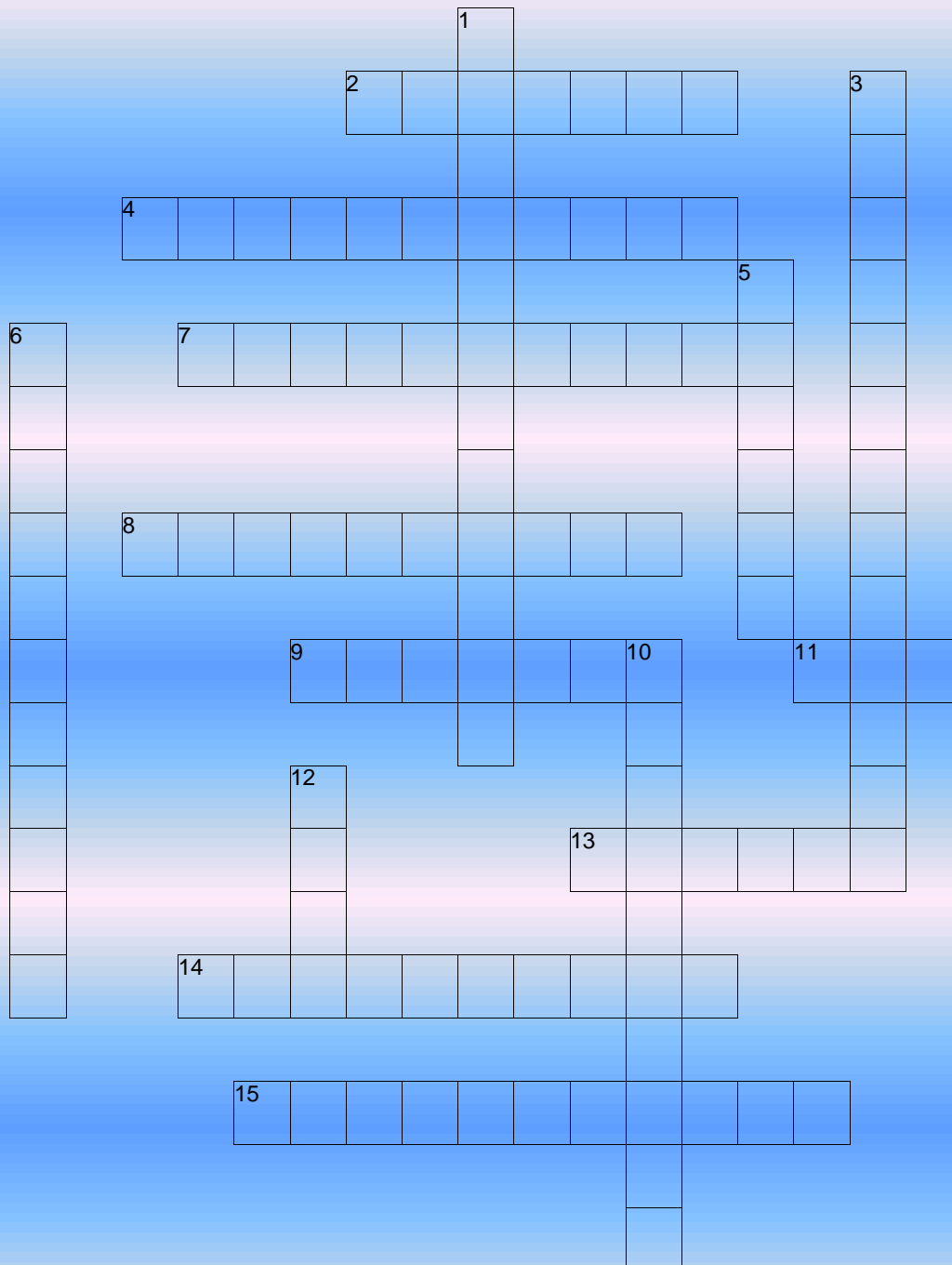
2. A line of 100 airline passengers is waiting to board a plane. They each hold a ticket to one of the 100 seats on that flight. (For convenience, let's say that the n th passenger in line has a ticket for the seat number n .) Unfortunately, the first person in line is crazy, and will ignore the seat number on their ticket, picking a random seat to occupy. All of the other passengers are quite normal, and will go to their proper seat unless it is already occupied. If it is occupied, they will then find a free seat to sit in, at random.

What is the probability that the last (100th) person to board the plane will sit in their proper seat?



(Answers: 1(3 Red, 3 Blue), 2(0.5 or 50 %))

Statistics Vocabulary Puzzle



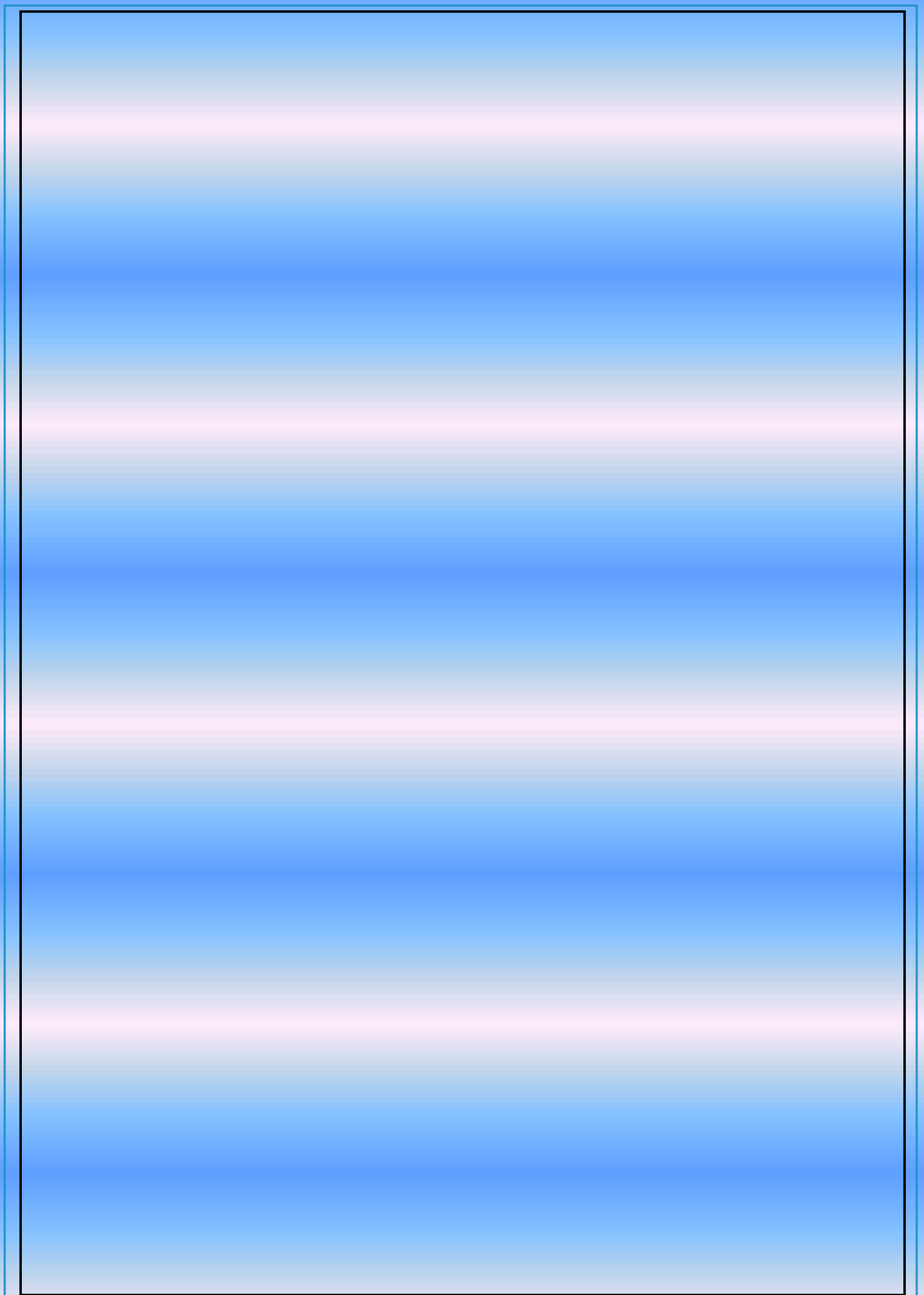
Across

2. All form some
4. Assume, deduce, decide
7. All the data that you can see
8. The entire group
9. A study using the sample
11. Simple Random Survey
13. Smaller group from the survey
14. A survey using a system
15. Numbers and things that go into a category

Down

1. Can do meaningful math
3. The people that were missed by your means of survey
5. A study using the entire population
6. The worst kind of survey
10. Some from all
12. Favortism

Crossword(1.Quantitative 2.Cluster 3.Undercoverage 4. Inferential 5. Census 6.convenience 7.Descriptive 8. Population 9.Surveys 10. Stratified 11.SRS 12.Bias 13.Sample 14. Systematic 15. Categorical)





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