

Research Methodology

By

M.Amalanathan

M.Sony Michael Mary

About the Authors

Dr.M.Amalanathan and Dr.M.Sony Michael Mary are the authors of this book. Dr.M.Amalanathan is currently working as Head and Assistant Professor in the Department of Physics, Nanjil Catholic College of Arts and Science, Kaliyakkavilai. He has 12 years of Teaching experience and 15 years of Research experience. He already edited and published one book 'Practical Physics' in the year 2014 and 'Programming in C++' in the year 2021. He served as editor for three conference proceeding. He already guided 4 Ph.D and 10 M.Phil students and guiding 6 Ph.D students. He published 59 papers in reputed international refereed Journals.He presented papers and participated in many national and international conferences and seminars. He served as resource person in so many events. He has served as a reviewer in many reputed journals in Elsevier, Wiley-Inter Science and Springer Publications.



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M.Amalanathan
M.Sony Michael Mary

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PREFACE

Learning is essential for students to enhance their future in the modern environment. Students have a lot of learning methods, but it is important to provide learning materials of the syllabus in a simple and understandable language. Based on this , Introduction to research methodology, step of doing research, the Literature collection activities involved in research problem method of writing the thesis, knowledge about Origin and Latex are expected to learn has been highlighted in the book, which will be useful for the students to read and understand the syllabus by themselves for their examinations.

This book has been written to meet the requirements of II year M.Sc Physics students in Manonmonium Sundaranar University, Thirunelveli. It contains five units according to the syllabus framed by the University. Research Methodology is a book to provide the basic idea about the Research Methodology, Origin and Latex .

This Book provides thorough idea about Introduction to Research and Defining Research Problem, Research Design and Experimental Method, Research Report, Plotting software: Origin and Typesetting Software: Latex in five chapters. This book addresses each concept in a clear, concise, and effective manner with examples learning. This book will enable the students to even learn Research Methodology their higher levels of learning Bloom's Taxonomy.

The authors thank the Correspondent Rev.Fr.M.Ecormens Michael, the Principal Dr.A.Meenakshisundararajan,, All the faculty members from the department of physics, and all the teaching and non-teaching staff of Nanjil Catholic College of Arts and Science, Kaliyakkavilai for their care and concern.

Above all I humbly thank God Almighty, whose sustaining grace has been sufficient for me in my all endeavors.

Vavarai

August 2022

Dr.M.Amalanathan

Dr.M.Sony Michael Mary

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PROGRAMMING IN C

As per M S University Latest Syllabus
I Year II SEM Allied Computer Science
With Solved Practical Exercises

Dr.D.SHARMILA

Dr. L.THOMAS ROBINSON

Dr.TJ.BENEDICT JOSE

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Preface

We present material in a simple straight forward manner. **Programming In C** is a manual for II Sem Allied Computer Science Syllabus. It covers the **Programming in C** lab and theory B.Sc Course of M.S. University.

Main reference Book followed for all chapters is **Programming in ANSI C – 6th Edition** by E Balagurusamy – **Tata McGraw Hill Publishing Company Limited**. This is the prescribed text book given for the students.

Author Team



Dr. D. Sharmila received her B.Sc degree in Computer Science from Womens Christian College Nagercoil. She obtained her MCA & MPhil degrees from Madurai Kamaraj University. She received her Doctor of Philosophy (Ph.D) in Computer Science in the area of Digital Image Processing from Mother Teresa Women's University, Kodaikanal. Previously she worked as Professor/HOD in the Department of Master of Computer Applications, Lord Jegananth College of Engg & Technology. At present she is working as an Assistant Professor in the Department of Computer Applications, Government Arts and Science College, Palkulam, Kanyakumari. She has published many research papers in International Journals and Conferences. She has presented many papers in National and International Conferences. She has attended many Faculty Development Programmes , Seminars, Workshops and Training Courses.



Dr. L.Thomas Robinson received his B.Sc. degree in Computer Science and MCA from Annai Velankanni College Tholayavattam . He received his Doctor of Philosophy (Ph.D) in Computer Science in the area of Data Mining and Sensor Technology from Bharathiar University Coimbatore. He had 14 years of teaching experience. Previously he worked as Assistant Professor in Anna University affiliated colleges, Chennai in Department of Master of Computer Application and in Republic of Maldives. At present he is working as an Assistant Professor in the Department of Computer Science, Nanjil Catholic College of Arts and Science, Kaliyakkavilai. He has published many research papers in International Journals and he has presented many papers in National and International Conferences. He has attended many Faculty Development Programmes , Seminars, Workshops and Training Courses.



Dr. T. J. Benedict Jose received his B.Sc degree in Computer Science from St. Xavier's College (Autonomous), Palayamkottai, Tamilnadu, India in the year 2004. He obtained his M.Sc degree in the field of Computer Science from St.Xavier's College (Autonomous), Palayamkottai, Tamilnadu, India in the year 2006. He received his Master of Philosophy (M.Phil) in Computer Science from Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu, India in the year 2008. He obtained his Doctor of Philosophy (Ph.D) in Computer Science in the area of Digital Image Processing from Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu, India in the year 2017. Previously he worked as Assistant Professor in the Department of Computer

Science, St. Xavier's College, Palayamkottai, Tamilnadu, India. At present he is working as Assistant Professor in the Department of Computer Applications, Government Arts and Science College, Palkulam, Kanyakumari, Tamilnadu, India. He has published many research papers in International Journals and Conferences. He has presented many papers in National and International Conferences. He has attended many Faculty Development Programmes, Seminars, Workshops and Training Courses. He acted as Resource Person and Chief Guest in many events. He is also the Red Ribbon Club Programme Officer in his college. He has been approved as a Research Supervisor by Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu, India. At present he is the SPOC (Single Point of Contact) of the TCS iON Digital Learning Programs under the TNSDC (Tamilnadu Skill Development Corporation) Project of Naan Mudhalvan Scheme offered by the Government of Tamilnadu. His area of interest includes Digital Image Processing, Cloud Computing, Computer Networks, Cyber Security, Big Data Science & Analytics, Robotics, Machine Learning and Deep Learning etc.

We welcome suggestions and feedback on the book.

The Authors

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Next, we would like to thank our family members and friends for their support and understanding for many hours dedicated to this work. No text of this book can be developed without the support of many people. To name them all is impossible. We would also thank ERES publications for their services.

The Authors

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PROGRAMMING IN C

Objective: To obtain knowledge about the structure of the programming language C and to develop the program writing and logical thinking skill.

Unit – I: INTRODUCTION C Declarations:

Character Set – C tokens – Keywords and Identifiers – Identifiers – Constants – Variables – Data types – Declaration of Variables – Declaration of Storage Class – Assigning Values to Variables – Defining Symbolic Constants – Declaring Variable as Constant. Operators and Expressions: Introduction – Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operator – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Expressions. Managing Input and Output Operations: `getchar()` – `putchar()` – `scanf()` – `printf()`. (14L)

Unit – II: CONTROL STRUCTURES

Decision Making and Branching: Decision Making with IF Statement – Simple IF statement – The IF...Else Statement – Nesting of IF...Else Statements – The ELSE IF ladder – The Switch Statement – The? Operator – The GOTO statement. Decision Making and Looping: The WHILE Statement – The DO Statement – The FOR statement. (10L)

Unit – III: ARRAYS

One-dimensional arrays – Declaration of One-dimensional arrays – Initialization of One-dimensional arrays - Two-dimensional arrays – Initialization of Two-dimensional arrays – Multi-dimensional arrays. Character Arrays and Strings: Declaring and Initializing String Variables – Reading Strings from Terminal – Writing Strings to Screen – String Handling Functions. (10L)

Unit – IV: FUNCTIONS

User-Defined functions: Need for User-defined functions – Definition of functions – Return Values and their Types – Function Calls – Function Declaration – Category of functions – No Arguments and No return values – Arguments but No return Values – Arguments with return values – No arguments but a return a value – Recursion – Passing Arrays to functions – Passing Strings to functions – The Scope, Visibility and lifetime of a variables. Structures and Unions: Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Structure Initialization – Arrays of structures –Unions. (14L)

Unit – V: POINTERS AND FILES

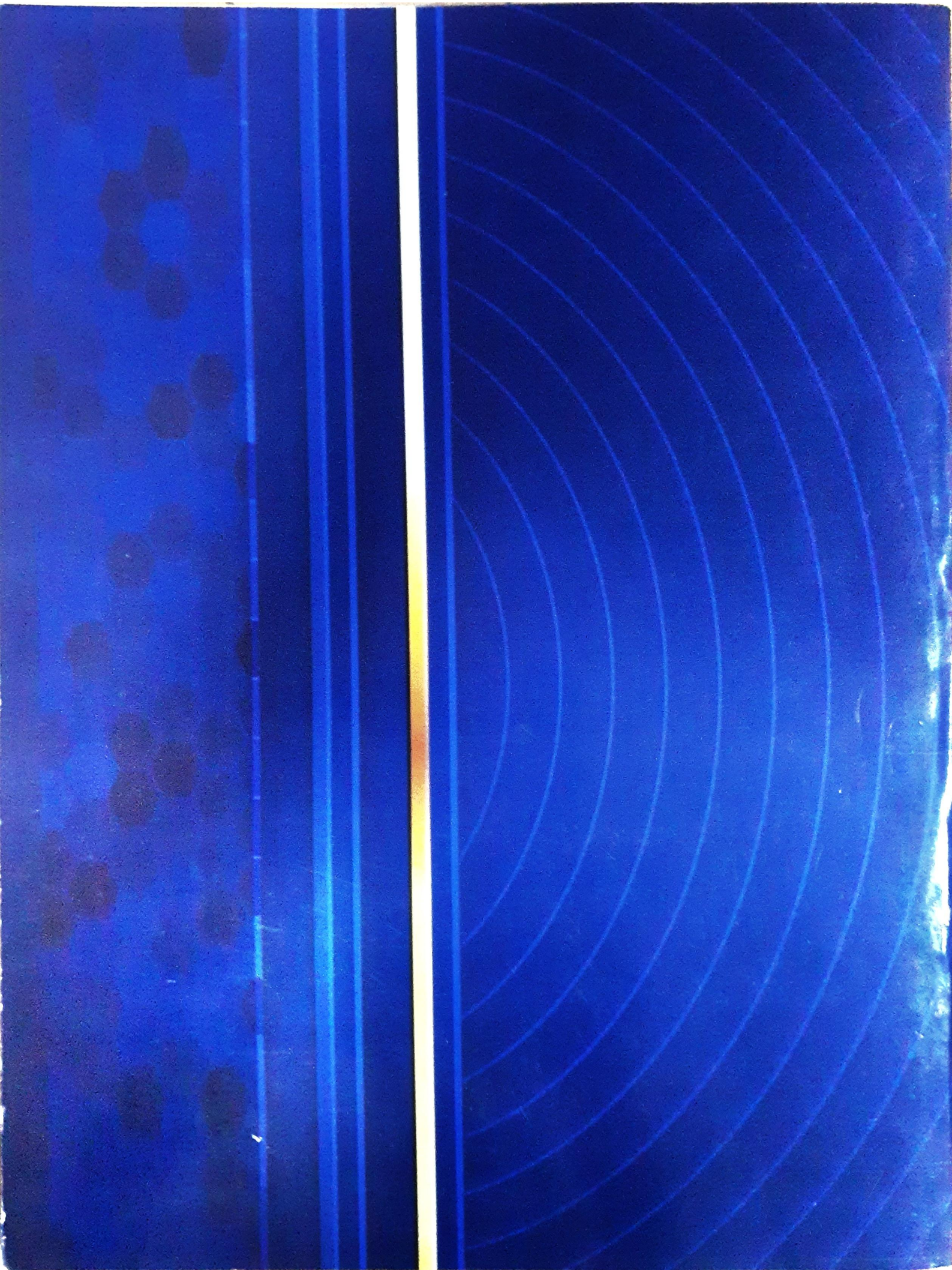
Pointers: Understanding pointers – Accessing the Address of a Variable – Declaring Pointer Variables – Accessing a variable through its pointer – Pointer Expressions –Pointers as function arguments. File Management in C: Defining and Opening a file – Closing a File – Input/output Operations on files – Error Handling during I/O Operations. (12L)

Text Book:

Programming in ANSI C – 6th Edition by E Balagurusamy – Tata McGraw Hill Publishing Company Limited.

C PROGRAMMING - LIST OF PRACTICALS

S. No	Name of the Program
1	Write a program to convert the temperature from Fahrenheit to Celsius.
2	Write a program to test whether the given year is leap year or not.
3	Write a program to read two integers m and n and print the prime numbers in between them.
4	Write a program to evaluate the series $e^x = 1 + x/1! + x^2/2! + \dots$
5	Write a program to arrange the given set of numbers in ascending order.
6	Write a program to read two matrices and to find the sum and product of the matrices.
7	Write a program to check whether a given string is Palindrome or not.
8	Write a program to find Factorial value, Fibonacci, GCD value-Recursion.



Research Methodology



RESEARCH

Dr. M. Sindhu

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RESEARCH METHODOLOGY

Dr. M. SINDHU, D.co-op, M.Com., M.Phil., Ph.D.,

Assistant Professor
Department of Commerce
Nanjil Catholic College of Arts and Science
Kaliyakkavilai – 629 153.

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Email:charulathapublication@yahoo.cominfo@charulathapublications.com. www.charulathapublications.com

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I also convey my hearty thanks to **Dr.R.Jolly Rosalind Silva**, HOD, Department of commerce Nanjil Catholic College of Arts and Science, Kaliyakkavilai for her help and encouragement for the successful completion of this book.

I express my sincere thanks to my dear friends and my colleagues in the department **Ms.V.Vincy** and **Dr.N.Vinil Kumar** who have always encouraged and supported me.

I thank immensely my husband **Mr.M.D.Raymond Anelin**, my mother **Mrs.N.Saroja** and my daughters **R.S.Annsbert Anelin**, **R.S.Bensbert Anelin**. Their efforts encouragement, motivation and sacrifice have enabled me to come up to this level. I am deeply indebted forever and remain grateful to them.

I convey my gratitude to **Mr.M.Bharathi**, **Ms.V.Geetha Priya** and the entire team of Charulatha Publications for having extended immense co-operation in the publication of this book.

Dr.M.SINDHU

SYLLABUS

RESEARCH METHODOLOGY

Objectives

1. To understand the basic concepts of research and its methodologies.
2. To organize and conduct research in a more appropriate manner.

Unit - I

Introduction to Research – Types of Research – Significance of Research – Research methods vs. Methodology – Research – Research process – Criteria of Good Research

Unit - II

Research Design– Meaning of Research design – need for research design – features of a good design – different research designs.

Unit - III

Design of sample surveys– sample design – sample survey Vs census survey – Types of sampling designs – Non probability sampling – probability sampling – Complex random sampling design.

Unit - IV

Data Collection and preparation– Collection of Primary Data – Methods of Collecting Primary Data - Guidelines for Constructing Questionnaire / Schedule- Difference between Questionnaire and schedule - Collection of secondary data – Data Preparation process.

Unit - V

Interpretation and report writing – Meaning of interpretation – techniques of interpretation – precautions in interpretation – significance of report writing – different steps in writing report – layout of the research report – mechanics of writing a research report – precautions for writing research report.

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INTRODUCTION TO RESEARCH

Introduction and Meaning of Research

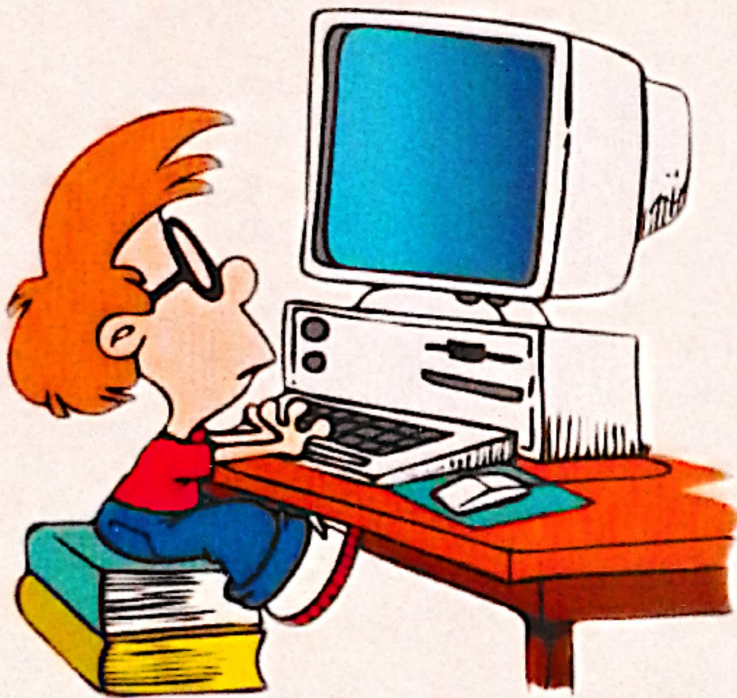
Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation.

The Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry especially through search for new facts in any branch of knowledge."

Definition

- 1) **Redman and Mory** defines research as a —systematized effort to gain new knowledge.
- 2) According to **Fred N. Kerlinger (2004)** scientific research is systematic controlled, empirical & critical investigation of hypothetical propositions about the presumed relations among the natural phenomenon.
- 3) According to **Kothari (2002)** Research is a systematic investigation to find solution to a problem.
- 4) According to **John W. Best (2002)** Research may be defined as systematic and objective analysis of controlled observations that may lead to development of organizations, principles & possibility ultimate control of events.

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