  
  
Partial Fulfillment of Bsc CSIT  
  
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Chapter: 4  
   
  
 *Project Introduction*

**Introduction and History of C**  
 ***C*** is a general-purpose, imperative computer programming language, supporting structured programming, lexical variable scope and recursion, while a static type system prevents many unintended operations. By design, C provides constructs that map efficiently to typical machine instructions, and therefore it has found lasting use in applications that had formerly been coded in [assembly language](https://en.wikipedia.org/wiki/Assembly_language), including [operating systems](https://en.wikipedia.org/wiki/Operating_system), as well as various application software for computers ranging from [supercomputers](https://en.wikipedia.org/wiki/Supercomputer) to [embedded systems](https://en.wikipedia.org/wiki/Embedded_system).

C was originally developed by [Dennis Ritchie](https://en.wikipedia.org/wiki/Dennis_Ritchie) between 1969 and 1973 at [Bell Labs](https://en.wikipedia.org/wiki/Bell_Labs), and used to re-implement the [Unix](https://en.wikipedia.org/wiki/Unix) operating system. It has since become one of the [most widely used programming languages](https://en.wikipedia.org/wiki/Measuring_programming_language_popularity) of all time, with C [compilers](https://en.wikipedia.org/wiki/Compiler) from various vendors available for the majority of existing [computer architectures](https://en.wikipedia.org/wiki/Computer_architecture) and operating systems. C has been standardized by the [American National Standards Institute](https://en.wikipedia.org/wiki/American_National_Standards_Institute) (ANSI) since 1989 and subsequently by the [International Organization for Standardization](https://en.wikipedia.org/wiki/International_Organization_for_Standardization) (ISO)  
  
The C language exhibits the following characteristics:

* There is a small, fixed number of keywords, including a full set of [flow of control](https://en.wikipedia.org/wiki/Flow_of_control) primitives: [for](https://en.wikipedia.org/wiki/For_loop), [if/else](https://en.wikipedia.org/wiki/Conditional_%28programming%29), [while](https://en.wikipedia.org/wiki/While_loop), [switch](https://en.wikipedia.org/wiki/Switch_statement), and [do/while](https://en.wikipedia.org/wiki/Do_while_loop). User-defined names are not distinguished from keywords by any kind of [sigil](https://en.wikipedia.org/wiki/Sigil_%28computer_programming%29).
* There are a large number of arithmetical and logical operators, such as +, +=, ++, &, ~, etc.
* More than one [assignment](https://en.wikipedia.org/wiki/Assignment_%28computer_science%29) may be performed in a single statement.
* Function return values can be ignored when not needed.
* Typing is [static](https://en.wikipedia.org/wiki/Static_typing), but [weakly enforced](https://en.wikipedia.org/wiki/Strong_and_weak_typing): all data has a type, but implicit conversions may be performed.
* [Declaration](https://en.wikipedia.org/wiki/Declaration_%28computer_programming%29) [syntax](https://en.wikipedia.org/wiki/C_syntax) mimics usage context. C has no "define" keyword; instead, a statement beginning with the name of a type is taken as a declaration. There is no "function" keyword; instead, a function is indicated by the parentheses of an argument list.
* User-defined (typedef) and compound types are possible.
  + Heterogeneous aggregate data types ([struct](https://en.wikipedia.org/wiki/Struct_%28C_programming_language%29)) allow related data elements to be accessed and assigned as a unit.
  + [Array](https://en.wikipedia.org/wiki/Array_data_type) indexing is a secondary notation, defined in terms of pointer arithmetic. Unlike structs, arrays are not first-class objects; they cannot be assigned or compared using single built-in operators. There is no "array" keyword, in use or definition; instead, square brackets indicate arrays syntactically, for example month.
  + [Enumerated types](https://en.wikipedia.org/wiki/Enumerated_type) are possible with the enum keyword. They are not tagged, and are freely interconvertible with integers.
  + [Strings](https://en.wikipedia.org/wiki/String_%28computer_science%29) are not a separate data type, but are conventionally implemented as [null-terminated](https://en.wikipedia.org/wiki/Null-terminated_string) arrays of characters.
* Low-level access to [computer memory](https://en.wikipedia.org/wiki/Computer_memory) is possible by converting machine addresses to typed [pointers](https://en.wikipedia.org/wiki/Pointer_%28computer_programming%29).
* [Procedures](https://en.wikipedia.org/wiki/Procedure_%28computer_science%29) (subroutines not returning values) are a special case of function, with an untyped return type void.
* Functions may not be defined within the lexical scope of other functions.
* Function and data pointers permit *ad hoc* [run-time polymorphism](https://en.wikipedia.org/wiki/Run-time_polymorphism).
* A [preprocessor](https://en.wikipedia.org/wiki/C_preprocessor) performs [macro](https://en.wikipedia.org/wiki/Macro_%28computer_science%29) definition, [source code](https://en.wikipedia.org/wiki/Source_code) file inclusion, and [conditional compilation](https://en.wikipedia.org/wiki/Conditional_compilation).
* There is a basic form of [modularity](https://en.wikipedia.org/wiki/Modular_programming): files can be compiled separately and [linked](https://en.wikipedia.org/wiki/Linker_%28computing%29) together, with control over which functions and data objects are visible to other files via [static](https://en.wikipedia.org/wiki/Static_%28keyword%29) and extern attributes.
* Complex functionality such as [I/O](https://en.wikipedia.org/wiki/Input/output), [string](https://en.wikipedia.org/wiki/String_%28computer_science%29) manipulation, and mathematical functions are consistently delegated to [library routines](https://en.wikipedia.org/wiki/Library_%28computing%29).

While C does not include some features found in some other languages, such as [object orientation](https://en.wikipedia.org/wiki/Object-oriented_programming) or [garbage collection](https://en.wikipedia.org/wiki/Garbage_collection_%28computer_science%29), such features can be implemented or emulated in C, often by way of external libraries (e.g., the [Boehm garbage collector](https://en.wikipedia.org/wiki/Boehm_garbage_collector) or the [GLib Object System](https://en.wikipedia.org/wiki/GObject)).  
  
  
  
  
  
 Relation to Other Languages:  
 Many later languages have borrowed directly or indirectly from C, including [C++](https://en.wikipedia.org/wiki/C%2B%2B), [D](https://en.wikipedia.org/wiki/D_%28programming_language%29), [Go](https://en.wikipedia.org/wiki/Go_%28programming_language%29), [Rust](https://en.wikipedia.org/wiki/Rust_%28programming_language%29), [Java](https://en.wikipedia.org/wiki/Java_%28programming_language%29), [JavaScript](https://en.wikipedia.org/wiki/JavaScript), [Limbo](https://en.wikipedia.org/wiki/Limbo_%28programming_language%29), [LPC](https://en.wikipedia.org/wiki/LPC_%28programming_language%29), [C#](https://en.wikipedia.org/wiki/C_Sharp_%28programming_language%29), [Objective-C](https://en.wikipedia.org/wiki/Objective-C), [Perl](https://en.wikipedia.org/wiki/Perl), [PHP](https://en.wikipedia.org/wiki/PHP), [Python](https://en.wikipedia.org/wiki/Python_%28programming_language%29), [Swift](https://en.wikipedia.org/wiki/Swift_%28programming_language%29), [Verilog](https://en.wikipedia.org/wiki/Verilog) (hardware description language),[[4]](https://en.wikipedia.org/wiki/C_%28programming_language%29#cite_note-vinsp-4) and Unix's [C shell](https://en.wikipedia.org/wiki/C_shell). These languages have drawn many of their [control structures](https://en.wikipedia.org/wiki/Control_structures) and other basic features from C. Most of them (with Python being the most dramatic exception) are also very [syntactically](https://en.wikipedia.org/wiki/Syntax_%28programming_languages%29) similar to C in general, and they tend to combine the recognizable expression and statement [syntax of C](https://en.wikipedia.org/wiki/C_syntax) with underlying type systems, data models, and semantics that can be radically different.

Database Management Using C  
  
A **database management system** (**DBMS**) is a [computer program](https://en.wikipedia.org/wiki/Computer_program) (or more typically, a suite of them) designed to manage a [database](https://en.wikipedia.org/wiki/Database), a large set of structured [data](https://en.wikipedia.org/wiki/Data), and run operations on the data requested by numerous users. Typical examples of DBMS use include [accounting](https://en.wikipedia.org/wiki/Accounting), [human resources](https://en.wikipedia.org/wiki/Human_resources) and customer support systems.

Originally found only in large companies with the [computer](https://en.wikipedia.org/wiki/Computer) hardware needed to support large data sets, DBMSs have more recently emerged as a fairly standard part of any company [back office](https://en.wikipedia.org/wiki/Back_office).

**Introduction to Our C Project**  
  
*Name of The Project: A Database Management System for Student’s Record.*  
*Aim of The Project: To provide an intuitive record management system capable of delivering efficiency with as less bugs as possible.*

*Detailed Overview of A School Record DBMS*:  
  
There are many school software in market and yes, the use of school software helps schools to save time & money both. How ? It can be Answered in an elaborated way.

Education has moved in leaps and bounds, so much that what could easily be recorded on paper a few years ago has today become a mission. Technology has forced us to look at paperless and easier ways to get the tasks done and the area of education is no different.

Today, schools face a lot of challenges on a daily basis just to operate the daily administration. Processes like declaration of results, data management, fees collection, timetable management, attendance management of both staff and students and other similar functions are done manually. Manual work takes a lot of time, energy and resources.

Such things can now be done easily thanks to school management software. The challenges faced by educational institutions to manage the day to day running of the school are immense and that is why it has become imperative that every school should have a management   
software to increase efficiency and reduce time and effort.  
  
**Listed below are twelve reasons why every school should have a school management system:**

**1. e-COMMUNICATION**

Students can have e-discussions with teachers whilst preparing for their exams and get their problems resolved.

For parents, it is a blessing in disguise for all those who want to be active in their children’s academic progress but cannot simply because they do not have the time. Parent-teacher communication is streamlined and this makes it easier for parents to keep track of their child’s attendance, tests, and discipline reports.

**2. ACCESIBLE ANY TIME ANY PLACE**  
Whether you are a teacher, parent or student, you can work on it from anywhere. Students can access their study material anywhere while teachers can look up lesson plans whilst mobile. No fixed installation or infrastructure is required, apart from a smart phone and a reliable internet connection.

**3. MONITORING ATTENDANCES**

Once upon a time, attendance was monitored by way of roll call, a chore that took the better part of thirty minutes. With a combination of smart cards or biometric devices, attendance is marked automatically and a notification is sent to all parents whose children are absent. This ensures that the parents are aware that their child is absent from school.

**4. SCHOOL TRANSPORT TRACKING**

Irrespective of whether you are the principal or a parent, GPS enabled school transport vehicles allow you to track the location of it and thus ensuring your child’s safety. It also enables vehicle drivers to get substitution in the event their vehicle breaks down. The school can also inform drivers of road closures or accidents so that the vehicles can be re-routed accordingly.

**5. SYSTEM ALERT SCHEDULING**

As a transport in charge, you need to ensure that the school vehicles attend their “annual” health check. Many a time these things are forgotten. The school management software enables you to create and alert notifying you in advance when the vehicles are due for inspection. In the same way, parents can receive alerts to notify them when the school fees are due. The Principal can also receive notification when a member of the teaching or admin staff takes unauthorized leave.

**6. SHARING OF KNOWLEDGE AND COLLABORATION BETWEEN DIFFERENT STAKE HOLDERS**

A common interactive platform, a school management system brings together teachers, parents, principals and students together. This in turns builds a strong school community by involving all the stakeholders in group discussions and engaging activities.

**7. CUSTOMISATION AND CONFIGURATION**

No two systems operate the same way. In the same way, no two schools function in the same way. The beauty of a school management software is such that it can be customized according to each school’s unique needs This means that you can get the system such that it recognizes your process flow and functions accordingly. It can also be tweaked according to the changing requirements of the school.

Various modules across the system can be customized whereby principals and teachers can choose and configure the modules according to their preference and importance.

**8. COMPREHENSIVE GRAPHICAL ANALYSIS**

As the head teacher of a school, you probably want to see monthly or annual graphs that depict summaries of leave and absenteeism rates across various departments. A school management software allows you to do this and much more. Multidimensional analyses of students performance, their progression trends can be carried out and students who are poor performers can be weeded out and helped accordingly. The analysis can also be done across non-academic parameters like finance, inventory and payroll.

**9. SUPPORT PAPERLESS CAMPUS**

Instead of using pen and paper, we are now using apps and smart phones, a much smarter and less cumbersome way of working. Information is now literally at the tips of all using the school management software. Gone are the days when you had reams of paper stuffed away in the filing cabinets.

**10. EASY INSTALLATION**

When you decide that you are going to make that investment in school management software, then all you need to do is get it configured and installed and you will have a robust system in a matter of hours. Once installed, you set up your personalized configurations unique to your school and lo and behold! You are ready to go.

**11. PERSONALISED TEACHING AND LEARNING**

Teachers can upload study material anytime, anywhere. They can also check the students’ performance reports, their homework and do a performance analysis.

In the same way students have access to study material at all times, and check their class schedules in advance. The online library catalogue will allow them to reserve or renew book anytime. Students can also interact with teachers and each other to revise and clarify doubts.

**12. TRANSPARENCY IN COMMUNICATION**

Parents are kept abreast of what is happening in the school via online newsletters and circulars as well as message alerts.

In today’s automated world, schools should not be left behind because they do not want to have access to the latest technology. Technology is advancing and making our lives easier and that is why every school should invest in a school management software for the betterment of education, and for the improvement of relationships between student, school and parents.

***Chapter 5***  
 **System Development Life Cycle**

The **systems development life cycle** (**SDLC**), also referred to as the **application development life-cycle**, is a term used in [systems engineering](https://en.wikipedia.org/wiki/Systems_engineering), [information systems](https://en.wikipedia.org/wiki/Information_system) and [software engineering](https://en.wikipedia.org/wiki/Software_engineering) to describe a process for planning, creating, testing, and deploying an [information system](https://en.wikipedia.org/wiki/Information_system).[[1]](https://en.wikipedia.org/wiki/Systems_development_life_cycle#cite_note-1) The systems development lifecycle concept applies to a range of hardware and software configurations, as a system can be composed of hardware only, software only, or a combination of both.  
  
For this project, we used this technique to evaluate what we need as a group of students and then approached it with the necessities. Some major phases of SDLC are explained below in detail:  
  
**Preliminary analysis**: The objective of phase 1 is to conduct a preliminary analysis, propose alternative solutions, describe costs and benefits and submit a preliminary plan with recommendations.

1. Conduct the preliminary analysis: in this step, you need to find out the organization's objectives and the nature and scope of the problem under study. Even if a problem refers only to a small segment of the organization itself, you need to find out what the objectives of the organization itself are. Then you need to see how the problem being studied fits in with them.
2. Propose alternative solutions: In digging into the organization's objectives and specific problems, you may have already covered some solutions. Alternate proposals may come from interviewing employees, clients, suppliers, and/or consultants. You can also study what competitors are doing.  
     
   **Systems analysis, requirements definition**: Defines project goals into defined functions and operation of the intended application. It is the process of gathering and interpreting facts, diagnosing problems and recommending improvements to the system. Analyzes end-user information needs and also removes any inconsistencies and incompleteness in these requirements.

A series of steps followed by the developer are:[[8]](https://en.wikipedia.org/wiki/Systems_development_life_cycle#cite_note-8)

1. Collection of Facts: End user requirements are obtained through documentation, client interviews, observation and questionnaires,
2. Scrutiny of the existing system: Identify pros and cons of the current system in-place, so as to carry forward the pros and avoid the cons in the new system.
3. Analyzing the proposed system: Solutions to the shortcomings in step two are found and any specific user proposals are used to prepare the specifications.

**Systems design**: Describes desired features and operations in detail, including screen layouts, [business rules](https://en.wikipedia.org/wiki/Business_rule), [process diagrams](https://en.wikipedia.org/wiki/Process_Diagram), [pseudocode](https://en.wikipedia.org/wiki/Pseudocode) and other documentation.

**Development**: The real code is written here.

**Integration and testing**: Brings all the pieces together into a special testing environment, then checks for errors, bugs and interoperability.

**Acceptance, installation, deployment**: The final stage of initial development, where the software is put into production and runs actual business.

**Maintenance**: During the maintenance stage of the SDLC, the system is assessed to ensure it does not become obsolete. This is also where changes are made to initial software. It involves continuous evaluation of the system in terms of its performance.

**Evaluation**: Some companies do not view this as an official stage of the SDLC, while others consider it to be an extension of the maintenance stage, and may be referred to in some circles as post-implementation review. This is where the system that was developed, as well as the entire process, is evaluated. Some of the questions that need to be answered include: does the newly implemented system meet the initial business requirements and objectives? Is the system reliable and fault-tolerant? Does the system function according to the approved functional requirements? In addition to evaluating the software that was released, it is important to assess the effectiveness of the development process.  
  
 If there are any aspects of the entire process, or certain stages, that management is not satisfied with, this is the time to improve. Evaluation and assessment is a difficult issue. However, the company must reflect on the process and address weaknesses.  
  
  
**Disposal:** In this phase, plans are developed for discarding system information, hardware and software in making the transition to a new system. The purpose here is to properly move, archive, discard or destroy information, hardware and software that is being replaced, in a manner that prevents any possibility of unauthorized disclosure of sensitive data. The disposal activities ensure proper migration to a new system. Particular emphasis is given to proper preservation and archival of data processed by the previous system. All of this should be done in accordance with the organization's security requirement.

## Chapter 6 Project Analysis 6.1 Methodology: The Bsc CSIT course provides a blend of Computer Science core with the knowledge of Information Technology making the students capable of doing projects on a large scale. We were provided with seemingly endless options from which we selected to do A Student Record System as a part of our Completion of Practical Assessment of C programming Language. 6.2 Duration: The Project was completed in one week. 6.3 Activities: Constant Meetings were conducted amongst group members and work load was divided equally so everyone could benefit from it. The Designing, Documentation, Development and Coding phase was all completed in this one week time period. 6.4 Feasibility Study A feasibility study evaluates the project's potential for success; therefore, perceived objectivity, it is an important factor in the credibility of the study for potential investors and lending institutions. We, therefore conducted this study with an objective and with an unbiased approach to provide information upon which decisions can be based. The Feasibility Studies that are necessary for our system development are mentioned below:   6.4.1 Technical feasibility*:* The system is feasible in a technical manner, a novice can learn the system and turn into an expert in a matter of hours. Priority was given to intuitive GUI during the development phase but no compromise was done in the efficiency of the software. 6.4.2 Economic Feasibility : The system has been made with economical feasibility in mind, the manpower that was employed to develop this system wasn’t unattainable and the resources needed for the completion of the project did not budge a hole in anyone’s pocket. 6.4.3 Legal Feasibility : The system uses the code which is not patented by any other organization, The GUI is very much authentic and the documentation has been done creatively. This implies that the system is legally feasible and can be legally licensed to any educational institute in need of a Database System for an affordable price. 6.4.4 Operational Feasibility : Operational feasibility is the measure of how well a proposed system solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development. After a lot of testing, it was concluded that the system is technically stable so it is not complex to operate.

## 6.4.5 Time Management: The Time Management for the project was done by first allocating a certain workload to all the individuals of the group and then making predictions on how much time each part of the project will take approximately. After which, the project got a head start. We took the help of a gantt chart to manage time efficiently.

## 

**Chapter 7  
Project Logic  
  
Entity Relationship Diagram**

STUDENT

**Flow chart**

Display

Display

Enter ID, Name, Parent’s Name, Class, Phone No.

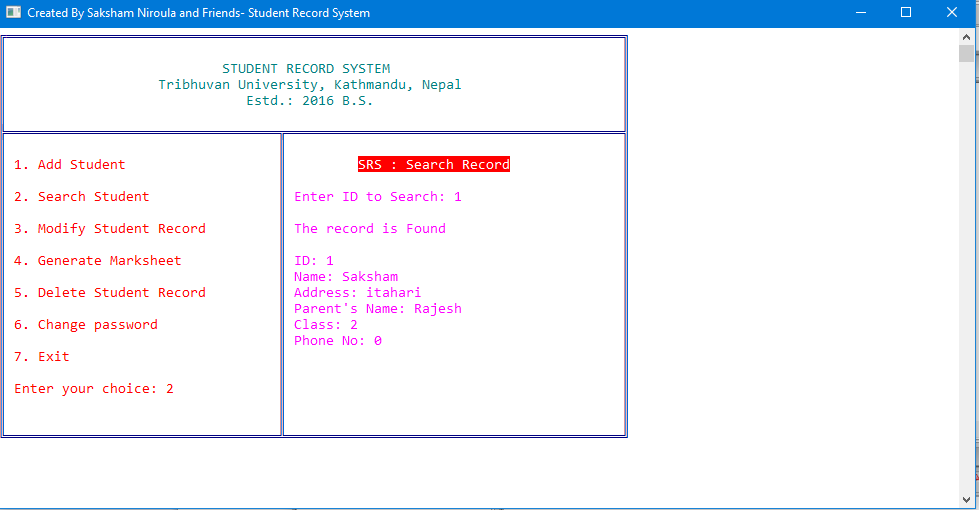
Enter ID

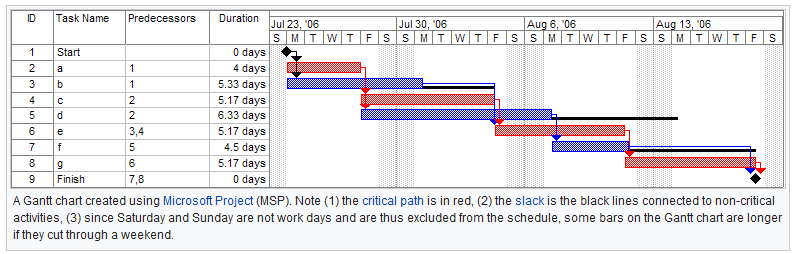
To view student information record

To Add Student Info

Student Record System

**Algorithm:  
  
Step 1: Start.  
  
Step 2: Display the Frontend of the Console.  
  
Step 3: To add Student  
 i. Enter ID  
 ii. Enter Name  
 iii. Enter Parent’s Name  
 iv. Enter Class  
 v. Enter Phone No.  
  
Step 4: To View Student Info:   
 i.Enter ID.  
-Display Information from Step 3  
  
Step 5: To Modify Student Record :   
 i. Enter ID  
 ii. Repeat Step 3  
  
Step 6: To generate Mark sheet ( Under Development, No backend yet).  
  
Step 7: To Delete Student Info:  
 i. Enter ID  
-Display, “Record successfully deleted.”**

**Step 8: To change password (Under Development, No backend yet).  
  
Step 9: Stop  
Screenshot of the Project:  
**

**Fig: Example of a Gantt Chart For Time Management  
  
**

**Conclusion  
*In this way* we *have successfully completed this project with great collaborative team effort. While doing this project, we learned a lot about various coding techniques, we learnt one or two things about data bases and how data science is one integral part of Information technology, The project felt tremendously challenging but equally rewarding, Big ups to the team members for doing their respective work with honesty. Special Thanks to Godawari College, affiliated to Tribhuvan University for providing this opportunity to work on a project as a course completion necessity.***