

LIST OF PROJECTS



Programming in C++ (CST-152)

Project Basket for Tutorials

1. Develop a project with necessary class & member function definition for a cricket player object.(Use array of objects) The program should accept the details from user (max 10): Player code, name, runs, innings- played and number of times not out. The program should contain following menu: -

- a) Enter details of players.
- b) Display average runs of a single player.
- c) Display average runs of all players. (**Use** function overloading).

Concepts used: Functions, variables, loops, arithmetic functions, breaks, boolean

2. Create a mini project that will:

- a) Allow a user to input a number
- b) Allow the user to see if the number is prime or not
- c) If the number is not prime, tell the user what number it is divisible by
- d) Use a function to process whether or not the value is prime (this idea will be used in a future challenge)
- e) Use double or Long for increased number length

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean

3. Create a mini project that will:

- a) Allow a user to input a number to iterate up to
- b) Allow the user to see all the dual primes, and a list of the numbers that are NOT dual prime
- c) Use either a vector or a list and their inherent member functions to handle the data from the loop

Concepts used: Functions, variables, loops, arithmetic functions, breaks, boolean, vectors (or lists), template class member functions

Hint: A dual prime is 2 prime numbers that are exactly "2" apart. Example: 3, 5 // 11,13, etc.

4. Design two base personnel (name, address, e-mail-id, birthdate) and academic (marks in 10th and 12th, class obtain) derive a class biodata from both these class. Develop a project to prepare

a biodata of a student having a personal information and academic information.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, boolean, vectors (or lists), template class member functions, inheritance, string stream

5. Develop a project for Cricket Score Management System.
 - a) It saves all the team and team members name and their history.
 - b) Each and every match can be updated lively using this program.
 - c) Point table of all the output will be shown.
 - d) ODI and test ranking table can also be viewed in this program Commentary of each ball can be viewed.
 - e) Increment of each ball, over, run is done automatically in this automated system.
 - f) As soon as someone checks the scoreboard, details of a particular player can be viewed by a single click on his name.
 - g) Any news other than cricket will also be updated.
6. Consider the following class hierarchy. create a base class employee (empcode emp name). Derive the class manager (designation clubdues),scientist(department name ,publication) and laborer from employee class. Write C++ menu driven
 - a) To accept the detail of 'n' employee.
 - b) To display the information.
 - c) To display all the entire of scientist from "chemical department".

Concepts used: Functions, variables, classes, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance

7. A mini project using C++ to record a score of a cricket match. One array stores information of batting team such as batman's name, runs score,etc. The other array stores information about bowling team. The project reads in above information and depending on user's choice, it displays either batting team's information or bowling team's information.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

8. Design a C++ mini project for A book shop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book, the sales person inputs the title and author and the system searches the list and displays whether it is available or not.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

9. Design a simple student information system

- a) Add Records
- b) List Records
- c) Modify Records
- d) Delete Records
- e) Exit Program to store data file is used

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor, string stream

10. Design a C++ Project on Travel Agency, Travel management

- a) The main objective of the project travelling agency is to make avail to the customers all sorts of travelling services.
- b) A host of services such as registration, display, search, modify etc are provided. In the registration step, the client has to provide his personal details.
- c) In the option of display all the client information is read like name, phone, cost etc. in the search tab, if information of a particular client is required, then that be obtained.

Concepts used: Functions, variables, classes, array , loops, breaks, boolean, vectors (or lists), template class member functions, inheritance ,constructor

11. In a bank, different customers having saving account. Some customers may have taken a loan from the bank. So bank always maintains information about bank depositors and borrowers.

- a) Design a Baseclass Customer (name, phone-number).
- b) Derive a class Depositor (accno, balance) from Customer.
- c) Again derive a class Borrower (loan-no, loan-amt) from Depositor.
- d) Write necessary member functions to read and display the details of 'n' customers.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

12. Design a mini project using class currency containing rupees and paise as data members. Write necessary member functions using operator overloading for the following:

- a) 1.currency (long int rup=0,int paise=0)
- b) 2.currency & operator += (currency &)(to add one currency to another)
- c) 3.currency & operator – = (currency &)(to subtract one currency from another) Accept Rupee & paise from user and display it.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

13. Develop a mini project that will:

- a) Display a list of numbers to the screen (random numbers).
- b) Pick one of those numbers at random and start a guessing game
- c) The user must guess the selected number. You must validate that the number the user guessed was valid, and among the choices listed.
- d) Tell the user whether or not the number they guessed is larger or smaller than the number you're looking for.
- e) After a certain number of guesses, the user loses and gets prompted to try again.

Concepts used: Functions, variables, loops, random functions, returns, boolean, vectors / lists / arrays, template class member functions, string stream

14. Develop a mini project that will:

- a) Use loops to complete the tasks below
- b) Print out a list of all the numbers that meet the following criteria, one item per line.
- c) Are either: Prime, or Multiples of 3, or 8, but not both 3 and 8, less than 2500

Concepts used: Variables, loops, arithmetic functions, breaks

15. You are required to model a vehicle parking lot system. The parking lot has a facility to park cars and scooters. The parking lot contains four parking lanes-two for cars and two for scooters. Each lane can hold ten vehicles. There is an operator with a console at the East end of the parking lot. The system should be able to handle following scenarios.

a. Arrival of a vehicle:

- 1.Type of vehicle (car or scooter) and Registration No. of vehicle should be entered
- 2.Program should display suitable parking slot
- 3.Vehicles arrive at East end, leave from West end

b. Departure of Car:

- 1.If not western most, all cars should be moved to the west
- 2.When the car is driven out, rest of the cars should be moved to the left
- 3.Vehicle data should be updated

c. Departure of Scooter:

- 1.Scooters should be able to drive out at random
- 2.Vehicle data should be updated

Note that when desired the operator must be able to obtain information like number of vehicles, number of scooters or number of cars currently parked in the parking lot. Also, the system should be able to display all the parking lots (currently occupied) if desired.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

16. Develop a mini project which demonstrate ATM machine.

User can; Log in, Deposit, Withdraw, Check Balance, View bank information, Log out

If you are interested on this project, please modify it by adding;

1. Input validation
2. Add more ATM features
3. Add more users (system only allow one user to log in)

Log in credentials are;

password: 1990

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

17. Design a mini project on library management system

Advance Features:

1. Creating User.
 2. Log In and Log Out facility for both admin and user.
 3. Restricting user to issue book if no copy of the book is available at that time.
- Obvious features for a Library Management System:

I. For User:

1. Viewing all books.
2. Book searching by book name,serial number,author name.
3. Book issuing and depositing.
4. Viewing profile.

II. For Admin:

1. Viewing all books.
2. Adding new books.
3. Updating existing book details.
4. Deleting books.
5. Viewing all Users.

Upcoming Features:

1. Updating User profile.
 2. Deleting User from system etc.
18. Develop a mini project that allows the user to enter the grade scored in a programming class (0-100).
- a) If the user scored a 100 then notify the user that they got a perfect score.
 - b) Modify the project so that if the user scored a 90-100 it informs the user that they scored an A
 - c) Modify the project so that it will notify the user of their letter grade 0-59 F 60-69 D 70-79 C 80-89 B 90-100 A

Concept used variables, data types, and numerical operators basic input/output logic (if statements, switch statements)

19. Develop a mini project that will:

- a. Allow a user to input a number
- b. Allow the user to see if the number is prime or not
- c. If the number is not prime, tell the user what number it is divisible by
- d. Use a function to process whether or not the value is prime (this idea will be used in a future challenge)
- e. Use double or Long for increased number length

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean.

20. Develop mini project in C++ that provide facilities like registration, search, display, modification, delete etc. in Travelling Agency Management System.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member functions

21. Develop Class Time Table Generator in C++ that support following constraints:

- a. A class can be placed only in a spare classroom.
- b. No professor or student group can have more than one class at a time.
- c. A classroom must have enough seats to accommodate all students.
- d. To place a class in a classroom, the classroom must have laboratory equipment (computers, in our case) if the class requires it.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member functions

22. Develop a mini project that help in performing day to day activities of Courier Service Centre such as maintaining employee details, booking a courier, maintaining hub details, maintaining company details & processing data of employees.

The different processes involved are:

- a. To maintain details of bookings manually.
- b. Calculate salaries of the employees.
- c. To maintain details of the incoming couriers.
- d. To maintain returns details.
- e. To maintain out return details.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member functions

23. Develop a mini project to find the area of different shapes (square, right angled triangle, circle etc.) using classes for creating objects of every shape.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member functions, inheritance.

24. Develop a Number Guessing Game in C++. Player deposits an initial amount to start playing game. He guesses a number between 1 to 10 and enters betting amount. If he wins he will get 10 times of money he bets. If he bets on wrong number he will lost his betting amount. Game continues till user wants to play.

Concepts used: Functions, variables, loops, random functions, returns, boolean, template class member functions, string stream.

25. Develop Insurance Policies management system that will help both customers and their agents to know about the current policies and enabling customers to select policies as per their choice in C++.

Concepts used: Variables, Vectors (Arrays), Functions, Objects & Classes , Loops, Variables, Strings, Streams and Files.

26. Develop Tic Tac Toe game in C++

Concepts used: Objects & Classes, Functions, Arrays(Vectors),Loops, Variables , Decision Control statements.

27. Develop Cafeteria Management System in C++ that allow their users to know what items are available under their canteen shop and in what quantity they are available. The customers are also provided with option of purchasing the particular item.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member functions.

28. Develop a mini project for shopping bill generation after entering all items with details & providing discount of 10% on purchase of 2000 or above. Also store the results in the files

Concepts used: Variables, Vectors (Arrays), Functions, Objects & Classes , Loops, Variables, Strings, Streams and Files.

29. Develop a mini project to solve any Linear Equation in One Variable in C++

Concepts used: Objects & Classes, Arrays, Operators, Variables, Functions, Loops.

30. Design Base Converter in C++ that takes a number in Base 10,2,8,16 and convert that number to other Base (base10,2,8,16)

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member function ,inheritance.

31. The total resistance of n resistors in parallel is: $1/R = 1/R_1 + 1/R_2 + 1/R_3 + \dots + 1/R_n$ Suppose we have a network of two resistors with the values 400 and 200. Our equation would be: $1/R = 1/R_1 + 1/R_2$

Substituting in the value of the resistors we get: $1/R = 1/400 + 1/200$ $1/R = 3/400$ $R = 400/3$

So the total resistance of our two-resistor network is 133.3.

Develop a mini Project in C++ to compute the total resistance for any number of parallel resistors.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member functions

32. Develop a mini project that have the following features

- a. Develop a parity class.
- b. The class supplies a member function named put, which counts the number of elements supplied.
- c. The other member function test returns true if an even number of put calls have been made and false otherwise.
- d. Member functions:

`void parity::put(); // Count another element`

`boolean parity::test(); // Return true if an even number of`

`// puts have been done. Return false`

`// for an odd number`

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member functions

33. Develop a mini project in C++ that automate voting process during elections enabling the

administrator to add new voters ,update their information or delete the voters information.

Concepts used: Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member functions.

34. Develop HI LO game in C++. The theme of the game is guessing a randomly selected integer number within range. If the user guesses too high or too low then the program should output "too high" or "too low" accordingly.

The program must let the user continue to guess until the user correctly guesses the number

Concepts used: Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member functions

35. Develop Medical billing system mini project in C++ .The main idea is to implement a software application for medical shops and hospitals for maintaining easy billing system.

Concepts used: Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member functions

36. Develop a mini project illustrating the use of all operators by writing functions of each category (such as arithmetic, logical, relational, bitwise category wise).

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean.

37. Develop a mini project of online quiz in C++.

Concepts used: Functions, variables, loops, template class member functions, break.

38. Develop a mini project of Attendance register of your class in C++.

Concepts used: Functions, variables, loops, template class member functions, break.

39. Develop a mini project of chat Application in C++.

Concepts used: Functions, variables, loops, template class member functions, break.

40. Write a program to create three classes Person, Professor and Student. The class Person should have data members name and age. The classes Professor and Student should inherit from the class Person.

Concepts used: Functions, variables, classes, array, loops, breaks, Boolean), template class member functions, inheritance.

41. Write a program which takes a set of inputs to create two matrices and prints the result of their addition. You need to write the class Matrix which has a member a of type `vector<vector<int>>` . You also need to write a member function to overload the operator +.

Concepts used: Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member functions, operator overloading.

42. A student signed up for n workshops and wants to attend the maximum number of workshops where no two workshops overlap. You must do the following:

Implement 2 structures:

1. *struct Workshop* having the following members:
 - The workshop's start time.
 - The workshop's duration.
 - The workshop's end time.
2. *struct Available_Workshops* having the following members:
 - An integer, *n* (the number of workshops the student signed up for).
 - An array of type *Workshop* array having size *n*.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean.

43. Kristen is a contender for valedictorian of her high school. She wants to know how many students (if any) have scored higher than her in the 5 exams given during this semester.

Create a class named Student with the following specifications:

- An instance variable named Scores to hold a student's 5 exam scores.
- A void input() function that reads 5 integers and saves them to scores.
- An int calculateTotalScore() function that returns the sum of the student's scores.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

44. Design a class named Box whose dimensions are integers and private to the class. The dimensions are labelled: length , breadth , and height .

- The default constructor of the class should initialize from 0.
- The parameterized constructor Box(int length, int breadth, int height) should initialize Box's and to length, breadth and height and show use copy constructor.

Apart from the above, the class should have 4 functions:

- int getLength() - Return box's length
- int getBreadth() - Return box's breadth
- int getHeight() - Return box's height
- long long CalculateVolume() - Return the volume of the box.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

45. Markup language HRML. In HRML, each element consists of a starting and ending tag, and there are attributes associated with each tag. Only starting tags can have attributes. We can call an

attribute by referencing the tag, followed by a tilde, '~' and the name of the attribute. The tags may also be nested.

The opening tags follow the format:

```
<tag-name attribute1-name = "value1" attribute2-name = "value2" ... >
```

The closing tags follow the format:

```
< /tag-name >
```

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor.

46. write a function `int max_of_four(int a, int b, int c, int d)` which reads four arguments and returns the greatest of them.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, constructor.

47. Write a program to print the N integers of the array in the reverse order in a single line separated by a space.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists).

48. Develop a mini project to create game of chess with your rules.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

49. Develop a mini project of Bus Reservation System in C++.

Concepts used: Functions, variables, classes, array, loops, breaks, Boolean, inheritance, constructor

50. Develop a mini project of Server to Exchange Data between text file and Excel in C++.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

51. Write a program to develop student report card of 1ST semester of CSE in C++.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

52. Develop a mini project of Research paper publishing system in C++.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists)

53. Develop a mini project of Login Authentication system in C++.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance.

54. Write a program to create your own social networking site in C++.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

55. Develop a mini project in C++ to Online Cab Booking project deals with an online system designed for booking cabs as per the requirements of the customers at their convenience.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member function, inheritance.

56. A mini project using C++ on Store Management System to automate the processes to reduce the clerical labor of the staff working in stores both technical and as well as accounts departments. This system uses the latest technologies and cost-effective tools thereby providing the better control to the management by avoiding manual errors.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

57. Develop a mini project on the sports event management system where students can find the details of various games and the information of the college where the games are being conducted. Admin will add all the collected information in the project where students can see and get register for the game.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor.

58. A mini project on Attendance Management System is software developed for daily student attendance in schools, colleges and institutes. It facilitates to access the attendance information of a particular student in a particular class. According to the requirements the system should minimum generate following kinds of reports. List of report is given below :

Semester wise Attendance

Daily Attendance

Attendance for extra class

Subject wise attendance

Leave reports on Approved or Not approved or Medical leaves

Black listed below 50%

Black listed below 75%

Concepts used: Functions, variables, classes, array, loops, breaks, Boolean), template class member functions, inheritance.

59. A mini project in c++ on Online Bus Reservation package to manage Buses, Routes, Services, Passengers & avail a degree of comfort to both Organization & Passenger. Today the leading Bus Travel companies are using these Packages to have an ease of mentality with their work.

Concepts used: Functions, variables, classes, array, loops, breaks, Boolean), template class member functions, inheritance.

60. C++ mini project for flight booking system. Array variables which are using in this program are:

route - this will store source to destination route

fare - this will store fare against defined route

totalFare - this will store total fare (fare + 19% tax on fare)

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member functions

61. A mini project in C++ on the Gas Agencies as the number of gas users are seem to increasing day by day. The transactions like booking gas, releasing gas, keeping records of all customers, etc.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member function, inheritance.

62. A mini project in C++ on Employee Record System. In this project, you can manage employee records – add, list, modify and delete records. The functions used in this project are simple and they basically manipulate file handling and data structures.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member function, inheritance.

63. A mini project in C++ on Cricket Score Sheet is developed. It uses file handling to store various information regarding runs, wickets, overs, extras, and many more. The project can display runs, wickets, names of batsmen and bowlers, overs, extras, economy of bowler, strike rate of batsmen, etc. It also displays the date and time of the game.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor.

64. A simple student database management system is developed in C++. It utilizes file handling and shows effective implementation of class and object of the programming language. This project is based on how to add, list, modify and delete records in file in C++ language.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

65. Student report card system project in C++ is a simple console application built without the use of graphics. In this project, users can perform typical report card related functions like adding a new student record and displaying, modifying, editing and deleting it.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

66. A supermarket billing system is developed in which a simple console application is built in C++ without the use of graphics. Two classes, class amount and class item can be found in this project in which class amount is inherited from the class item.

Concepts used: Functions, variables, classes, array, loops, breaks, boolean, vectors (or lists), template class member functions, inheritance, constructor

67. Telephone directory project in C++ that uses very simple file handling operations to make up the whole project; these include adding, deleting, searching, listing and modifying records, to or from file.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member function, inheritance.

68. A mini project on Travel Agency Management System in C++ is developed that stores the travelers travel data and the system can also add, delete, and edit user information.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member function, inheritance.

69. Online Staff Leave Management mini project in C++ is developed that records the all kinds of leaves taken by the staff.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member function ,inheritance.

70. Online Book Store mini project in C++ is developed that keeps record of books available in the store, number of books sell on particular date etc.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member function ,inheritance.

71. A mini project on Time table Management System is developed that are:

Easy work allotment method – both class wise and teacher wise.

Clubbing of divisions is possible.

Smart classroom facility can be effectively and easily clubbed

Lab periods can be easily set according to the availability of lab rooms

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member function , inheritance.

72. Online gas agency management system is an online computerized system for managing gas connection request and Gas Booking System. This application manages gas agency, Customer Relationship Management, and cylinder record and also handles gas booking and location transfer requests.

Concepts used: Functions, variables, loops, arithmetic functions, breaks, Boolean, vectors (or lists), template class member function , inheritance.