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# DESIGN

### OOPS

#### ABSTRACTION

Existing in idea, but no physical existence.

Metaphor

Make humans to fly.

#### POlymorphism

Metaphor

Loading tasks to employee

#### INHERITANCE

1. Used to get the properties of the any existing class and adding enhancing the existing one.

Metaphor

Consider class with employee and manager class. Credit salary will be common for all employee, whereas decideSalary will be only for manager.

Types:

1. Single inheritance
2. Multiple inheritance(more than one super class)
3. Multilevel inheritance
4. Hybrid inheritance
5. Hierarchical inheritance

Using Inheritance scope of job is high

We can use inheritance when scope of the jobs is high. Eg: Edit, create, delete. But base should be given propername.

### UNCATEGORIZED – PERFORMANCE

1. Master/Slave port

### DATA MANAGEMENT

#### BRINGING DATA TO APPLICATIOn

Huge columns and column will be picked by data provider

1. Using stored procedures to read data from flat file separated by comma’s

#### PERFORAMANCE TUNING- LARGE DATA

1. Partitioning of data
2. Virtualization

Screen scrolling

1. Multithreading
2. Asynchronous processing

### MICROSERVICE

#### cpp Microservice

It is the project which provides the framework for microservices implementation.

# PROGRAMMING

### Static analyzer

CWE – Common vulnerability enumeration

List of all common mistakes in programming.

MISRA

Motor industry software reliability association.

# C PROGRAMMING

### TYPES

#### CASTING

Functional casting

double d=int(5);

C-Style casting

double d=(int)5;

### LIBRARY

#### DYNAMIC LIBRARY

Import Library

It will use two library files. One is lib file and another is dll file. While compiling it will verify the symbols in lib file and during run time it will refer the actual definition.

# C++ PROGRAMMING

### OOPS CONCEPTS IN C++

#### Abstraction

Class which contain pure virtual function is called abstraction.

### TYPES

### POINTERS-C++

Printing pointers

Why printing pointers by directly assigning some integer value to pointer returning different value ?

int \*ptr=(int) 10;

std::cout<< ptr ; // Prints hexadecimal of 10.

C++ stores everything in binary format (base 2) internally. When integer is printed it will return always in decimal(base 10). Where as when pointer is printed it always prints in hexadecimal (base 16). It doesn’t matter what base you used while assigning a value. Let clarify with example

int a=10; // used base 10

int b=0XD; // Using base 16 to store.

std::cout << a << b ; // Prints 10 and 13(Hexadecimal value of D)

### IMPLICIT TYPE CONVERSION

Allowed types overview

1. Unsigned to signed is allowed.

### EXPLICIT TYPE CONVERSION

#### CASTING

Metaphor

Converting from one object to other object. Toys.

What is need for casting?

C++ is strongly typed language. So If any type is changed, it has to be done knowingly.

Why C++ Style casting?

In C-Style casting there is chance user can perform invalid casting unknowingly, and it will cause run time error. To avoid this C++ style casting is introduced.

Why static and dynamic cast is named so?

In static cast both source and destination type is fixed. Where as in dynamic cast source type is unknown. Source type can be anything hiding under the base class type.

Implicit conversion and casting

Implicit conversion is not casting. Casting is something converting externally.

Types of casting operators

1. static\_cast<>
2. dynamic\_cast<>
3. const\_cast<>
4. reintrept\_cast<>

Type cast operator (or) user defined conversion operator

void IamSoruceClass::operator IamDestingationClass()

{

//Converts from source class to destination class.

}

#### TYPES OF CASTING

Metaphor

Browsing site is allowed in office, but every one is using for different category like educational,movie.

Static cast

Metaphor

Compiler is judge and he decides everything

Dynamic cast

Metaphor

Operating system is judge and he decides everything.

Reinterpret\_cast

Reinterpret- Meaning of interpret is finding the meaning of something. So reinterpret is redefining the meaning of something.

### String

String literal

|  |  |
| --- | --- |
| TYPE | Syntax |
| UTF 8 string | u”IamUTF8String” |

### CONSTRUCTOR

Notes

1. Throwing exception at constructor is perfectly valid scenario. Beware of global objects, because we cannot catch exception.

### INPUT AND OUTPUT

#### CONSOLE INPUT AND OUTPUT

#include<iostream>

#include<string>

int main()

{

std::string coutDemo="Hello, Vinoth";

std::cout << coutDemo;

std::string cinDemo;

std::cin >> cinDemo;

std::cout << cinDemo;

return 0;

}

#### FORMATTING

#### Streams

Basic\_iostream

Ios\_base

Basic\_io

Basic\_istream

Naming convention

1. Every stream class starts with “basic\_”

### ROGUEWAVE LIBRARY

#### RWUString

Toutf8()

encode the multibyte character string in UTF 8 format to store in RWCString.

#### Dates

RWDBDATETIME

1. Sort can be applied after copying to any container.

RWDateTime date1("January 10,2000",RWDateTime::setDate);

### TYPES

#### String

String Literals

Multibyte character

### RW-JOINS

1. When special kind of join need to be used, then only RWJOINExpr has to be used. Mixing of criteria based joins with RWJOINExpr won’t work.

### Miscellaneous

From()

It clears all the table name gained so far using columns. We have to mention manually.

### C & C++ difference

|  |  |  |
| --- | --- | --- |
|  | C | C++ |
| String literal | Type String literal is char\* | Type is const char\* |
|  |  |  |
|  |  |  |

### INITIALIZATION

#### Types of initialization

Zero Initialization

User defined type

1. Members of the class will be initialized to zero or respective types default values, even member was not explicitly mentioned to initialize.
2. This takes in to effect when empty function call symbol is used at end of object or class in case of dynamic memory and empty constructor is not explicitly defined.
3. When constructor is explicitly defined, then this type of initialization won’t work.
4. If integer it will be initialized to zero, if string it will be initialized to empty string (“”)

Syntax

MyClass obj();

MyClass \*ptr=new MyClass();

Standard type

1. To zero initialize standard types use empty curly braces

int a{};

int a=int{};

float f{};

float f=float{};

Default initialization (In terms of taking the initialization values)

1. Whatever developer has mentioned in constructor, that value will be considered for intialization.
2. This takes in to effect when empty function call symbol is not used at end of object creation or empty constructor is explicitly defined.

MyClass obj;

MyClass \*ptr=new MyClass;

Value initialization

Standard types

1. Use the values in curly braces

int a{5};

#### Initializer list

Initializing the members in constructor, before actual invocation of constructor

#### List Initialization

Initializing using curly braces while declaring object

std::vector<int> obj={5,554,54,425,54};

Using list initialization in constructor

Myclass::Myclass() : myVector{5,5452,5454}

{}

Initializer\_list class

It is used to hold the list initialization.

std::initializer\_list obj={5,124,51};

std::vector<int> vec=obj;

Map list initialization

std::map<int,string> myMap= {

{5,”HAI”},

{6,”HELLO”}

};

### References

Relation with array

Reference to array

Syntax

int arr[100];

int (&myRefToArray)[100]=arr;

Array of references

It is not possible in c++

// int &arr[100]; // Compilation error

// int &(arr[100]); // Compilation error

### LIBRARY

### TRAINING

#### Practice problems

Grading Program

* 1. Write a program that allows the user to enter the grade scored in a programming class (0-100).
  2. If the user scored a 100 then notify the user that they got a perfect score.
  3. Modify the program so that if the user scored a 90-100 it informs the user that they scored an A
  4. Modify the program 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

Employee Information

Focusing class related concepts

* 1. Create employee class
  2. Keep employee info in members
  3. Print employee info when requested
  4. Create BnyMellon Employee class and derive from employee
  5. Keep employee id in private
  6. get employee information from user
  7. Get 5 employee information and store it.
  8. Find employee by employee id and print their details

# WINDOWS BASED PROGRAMMING

### BUILD TOOLS

Dumbbin

Lists all the symbols and library reffered for that symbol

Lib.exe

1. Displays all symbol in give lib file if it is static libray.
2. If it is import library then it won’t display symbols.

### LIBRARY

#### STATIC LIBRARY

#### DYNAMIC LIBRARY

Import library

\_declspec(dllimport)

\_declspec(dllexport)

#### STATIC AND DYNAMIC LIBRARY – COMMON DETAILS

Lib extension files

Not all lib files are static files. Lib files can be import library too.

### Multithreading

SampleCode

\_beginthread(FunctionName,StackSize,Data)

\_endthread();

### COMMANDS

|  |  |  |  |
| --- | --- | --- | --- |
| COMMAND | Description | Example | Options |
| regsvr32 | Register the dll in to registry | Regsvr32 myDll.dll | u - Unregister |
|  |  |  |  |

# DATABASE

### JOINS

Using more condition in join’s on

TableA INNER JOIN TableB on (TableA.primaryIdField = TableB.primaryIdField && TableA.SomeField is NOT NULL)

What’s the difference

Before join is applied, this condition will be executed.

### SQL SERVER

#### Types

Wide characters

1. To insert wide character use N prefix

#### UNCATEGORIED

1. XML data can be directly used in SQL query.

### DATABASE COMPARISON

|  |  |  |
| --- | --- | --- |
| NAME | SQL SERVER | ORACLE |
| All table information |  | Sys.tables |
| Change case | upper() | upper() |
| Date | Currentdate() | sysdate |
|  |  |  |

# UNCATEORIZED

### POWERPOINT

New slide from text file

1. Clieck down arrow of new slide button
2. Select new slide from outline.

### PERSONAL DEVELOPMENT

#### BEST HABITS

1. Judging against best

### MULTILINGUAL

#### Codes

Unicode

Mapping all languages character to unique number.

#### ENCODING SCHEME

UTF-8

1. Mechanism used to encode the multibyte characters using 8 bits.
2. Beauty is It will use only one byte when character is single byte character and it will use multi byte for multi byte character
3. For single byte character, only 7 bits is used. UTF-8 encoding uses that extra 1 bit to manage the multibyte character, When byte is read and if MSB is 1, then it denotes that byte is multi byte character.

#### ETC

Why text is scrambled?

1. Tool which we are using is not decoding in UTF-8 format rather it is decoding in ASCII format.
2. Copied the text from ASCII decoded tool, and pasting to UTF-8 supported tool won’t work.

### COMMON OPERATING SYSTEM

#### TERMINOLOGY USAGE

|  |  |
| --- | --- |
| WINDOWS | LINUX |
| Command line switches | Command line options |

### BUSINESS INTELLIGENCE

### INVESTMENT BANKING

#### TERMINOLOGY

OLAP

OLAP is broader category of business intelligence, which mainly focuses on multi-dimensional data analysis.

#### SECURITY

Any tradable asset.

Derivative

Value depends on the underlying security.

## WINDOWS

#### Find

|  |  |
| --- | --- |
| “\*+\*” | To search for + then, “\*+\*” |
| File: | To search only file |
| Content: | To search in file contents |

## COVERITY

|  |  |  |
| --- | --- | --- |
|  |  |  |
| Uninitialized scalar field | Scalar refers to individual variable. Any uninitialized individual variable |  |
| Arguments in wrong order |  |  |
| Array compared to 0 |  | if(“MyString” == true) |
|  |  |  |

## SQL SERVER DEVELOPER

### SHORTCUT KEY

|  |  |
| --- | --- |
|  |  |
| Alt+F1 | Table properties |
|  |  |
|  |  |

## PL/SQL DEVELOPER

### SHORTCUT KEY

|  |  |
| --- | --- |
|  |  |
| F8 | Execute Query |
|  |  |
|  |  |

## VISUAL STUDIO

### SHORTCUT KEY

|  |  |
| --- | --- |
|  |  |
| Alt+F7 | Project properties |
| Ctrl+F7 | Compile Single File |
| Ctrl+K,Ctrl+F | Align the selected text |

### TFS

|  |  |
| --- | --- |
|  |  |
| noprompt | Don’t display the UI |
| Stopafter:n | Shows only n records |
| Version:  w-Workspace version | Type of version |
| History | History of change set |

### VISUAL STUDIO DEBUGGER

|  |  |
| --- | --- |
|  |  |
| Skip lines | Ctrl+Shift+F10 |
|  |  |
|  |  |
|  |  |

## DROP BOX

**SQL Server:**

Identity column or auto increment: Column

1. Column which increase the number every time.
2. By default Values of particular column cannot be updated because change identify column is on

**Oracle**

Sequence:

1. When cache is on, then there will be mismatch in last number and currval since cache will not be updated frequently with database
2. When abnormal shutdown of database is done, then there is chance that sequence may miss in between. This is because cache will not be updated to actual disk storage.
3. When cache size is 10, then 10 sequence numbers will be in cache.
4. Cache size cannot be 1 because there is no meaning in enabling cache
5. Alter sequence NOCACHE

**Visual studio – Productivity tools**

1. Code snippet manager

**Windows – API**

1. To find the first file in directory use findfirstfileof function

**Windows – Commands**

1. netstat –a : To find the all the ports status and check whether they are listening
2. findstr textname : To find the text in given line. Alternative of grep in linux

**C++ Design – Best Practices**

Imperative and declrative programming

Imperative:

Full stack development

1. Three tier architecture(Presentation Layer, Business Layer, Data access Layer)

Framework and library

Library: COllection of functions

Framework: Generic implementation

1. Hollywood principle : Don't call us, we will call you.

2. Inversion of control

Typescript

1. Object oriented scripting language
2. TypeScript is primarily designed to write javascripts in terms of object oriented way.
3. This script which allows us to convert to javascript finally

**Angular**

* Front end javascript framework
* Uses typescript as language
* Uses HTML and Typescript to build a client application
* ng represents the second and third letter of angular or next generation
* Angular and angularjs is different. Angular is component based model
* It is named based on angle bracket of HTML tags

Components

1. Building block of angular application
2. Each angular application will have one root component

Creating new angular app

1. ng new applicationName
2. Staring server
   1. Go the the app folder
      1. ng serve –open

Angular CLI options

1. –dir : Directory name
2. --style:mystyleName

Components

1. It is building blocks of angular application.
2. Each component will have its own HTML page, css file
3. Component is nothing but simple open and closing html tags and that will be replaced with respective components HTML page

<app-root> </app-root>

1. App-root is component which will be created while creating a new angular application.

Multilingual

Data storage for UTF-8

1. To present any character in asci we need only 7 bits in a byte. UTF-8 storage uses the extra 1 bit to indicate that there are further more bytes are there to complete single character
2. UTF-8 takes the extra bytes to store the character only for the non-ascii character. For asci character only one byte will be used.

C++ Wide string

It is used to store the multilingual data.

String Literals

L”HAI” – Read Hai as wide character

Input and ouput

Wprintf – It should be used for console printing.

Financial Market

Uncategorized Terminologies

Market value Vs Share Value

When company is listed in stock exchange then it is market value.

When company is not listed in stock exchange then it is share value.

Assets under custody

1. Securities which is given to investment bank to keep it safe.
2. Company has no rights to take decision on buy or sell

Assets under Management

1. Money will be given to investment bank and bank’s fund manager will take decision on buy or sell

Expense and expenditure

1. When spending on something for short term it is expense
2. When spending on something for long term it is expenditure

Lifecycle of Trade

1. Creating assets
2. Buying and selling asset
3. Asset Management
4. Asset Maintananace
5. Asset Restructure

Lines of business

1. Corporate Trust
2. Helping a borrower for arranging a money from investor as loan(Debt)
3. This people is responsible for crediting the interest to investor account by getting amount from investor
4. Responsible for collecting collateral from borrower.
5. Bny Mellon Markets
6. Helping a borrower for arranging a money from investor from equity market.
7. Provide end to end services in executing the trade like booking trade, providing brokerage services etc.
8. Depository Receipts
9. When clients wants to sell their bonds in foreign countries, then it has to be created as depository receipts.
10. Treasury Services
11. Managing the money
12. Asset Servicing
13. Providing the supports for managing the asset.
14. Creating the monthly report about the holding,
15. Calculating the performance measurement.

### PROBLEM SOLVING

#### Concepts

1. Serial thinking
2. Park apart
3. Divide and conquer
4. Every good things will take time
5. Enjoy the failures
   1. Feeling bad when we are not able to solve the problem.
6. Start from root
   1. Trying to solve advance case first
7. Focus on objective
   1. In Divide and conquer focus on the objective.
8. Doubt the information
   1. When not able to solve the problem, doubt the information which we are relying on.

#### FREQUENTLY FAILURES

### ROGUEWAVE

#### Criteria

### Cross Platform Development concepts

COM – Component Object Model

1. COM is concept where library will be developed independent of operating system and language.

COM Vs Regular DLL

1. There is difference between COM DLL and regular DLL. They cannot used inter chageablly.

OCX FILES

OCX is type of Object linking and embedding file type.

#### Library

Windows Specific Implementation

#import directive

It will be used to import the COM DLL in to the code.

#### Database

Length of string

Oracle

len(string)

Sql server

length(string)

Limiting the number of rows

Sql server

Select top 5 \* from emp

Oracle

Fetch Offset

1. Should be given after the order by statemetn

Limit the rows

Select \* from emp ordery by empid fetch first 10 rows only.

Using row number

Select \* from (Select \* from emp order by empid desc) A where rownum<=10

Data types

ANSI Supported types

List of types

1. CHAR
2. VARCHAR
3. NVARCHAR

VARCHAR

1. Oracle supports only 4000 bytes, whereas SQL server supports more than 4000 bytes.

Oracle Specific types

List of types

1. CLOB

CLOB

1. Stands for Character large object
2. Supports up to 4 GB

ODBC

1. To establish connection between database server and app server
2. It can be used for SQL server and oracle.

Table Creation

Using existing table

SQL

Select top 0 \* into newTableName from myTable

ORACLE

Create table newTableName as select \* from myTable

Type conversion

String to other types

SQL

convert(DATETIME,’31-12-2005’,styleNumber)

ORACLE

to\_date(date,dateformat)

Inline view

Using select statement instead of table name in query is called as inline view

Select \* from (select myColumn from SomeTable) myInlineView;

Subquery

1. Query which supplies input to outer query
2. Outer query will not depend on inner query for every row

Select \* from emp where empid in (select empid from retiredTable)

Correlated Subquery

1. Query which supplies input to outer query
2. Outer query will depend on inner query for every row

Select \* from emp e where salary > (select avg(Salary) from salary where deptId=e.deptId)

Results filtering

Exists

Checks whether select statement returns any data.

select \* from emp where dept\_id exists (Select dept\_id from departments)

Column selection

Common table expression

with myCTE(myColumn1,myColumn2)

as

(

Select empid,age from emp

)

Select \* from myCTE;

Performance tuning

1. Using exists and in clause
2. When results of subquery is large, then exists should be used
3. When results of subquery is small, then in clause should be used

#### UNIX COMMANDS

|  |  |
| --- | --- |
|  |  |
| dirname | 1. Returns the directory name by removing the file name 2. When file name is not specified, the it removes the last most directory |
|  |  |

#### C PROGRAMMING

Enum notes

1. In C style enum, when it is used with switch case, any c style enums value can be given as case values unless the no enum values are

Numeric limits – Mathematical representation

Unsigned Integer – 0 to (2^n)-1

Signed integer : -(2^n-1) to (2^n-1)-1

Unsigned integer

Notes

It is not recommended to use to save one bit.

UNCATEGORIZED

STRING LITERAL

Memory Layout

1. The place where string literal is physically stored will depend on the operating system
2. String literal will be stored in text segment or data segment.

#### PROCESSOR

X86

It represents that it belongs to INTEL 8086 architecture.

Memory address register

It is used to store the address which is used for reading or writing in later point of time.

#### ASSEMBLY LANGUAGE

Instructions

Movb

Move the value to respective memory address.

#### Mathematics

#### Number system

Possible Numbers that can be formed

(possible values of number system count) ^ (Number of digits)

For example, for binary number system, single byte can represent

(2^8)-1 = 256 possible values

For example, for decimal number system, three digits can represent

(10^3)-1 = 999 possible values

#### COMMUNICATION

Communication Mistakes

1. Black box explanation in dark room

#### Uncategorized

Stack overflow mistakes

1. Asking suggestions for which tool can be used
2. Not mentioning the things we researched before asking the question.

#### Programming

Productivity tools

Static Analyzer tool

Static Analyzer tool list for C++

1. Cpp check
2. Gtest
3. Coverity

#### GRAMMAR

### Tense

#### TENSE CHART

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Past | Present continuous | Preset prefect | Future tense |
|  | Had | have |  |  |
|  |  |  |  |  |

#### ETC

Using just

We have to use just when some activity is completed recently.

I just completed the task.

Sentence forming errors

1. Use of may or may not be

Vinoth may or may not be in that room. // Wrong

Vinoth may be in that room. //Correct

Design