**1.WRITE DOWN THE CODE FOR FOLLOWING DIAGRAM USING POLYMORPHISM for bank (sbi,axis,icici)**

#include <iostream>

using namespace std;

class Bank {

public:

virtual float getRateOfInterest() = 0;

void displayInfo(const string& bankName) {

cout << "Bank Name: " << bankName << endl;

cout << "Interest Rate: " << getRateOfInterest() << "%" << endl;

}

};

class SBI : public Bank {

public:

float getRateOfInterest() override {

return 8.4f;

}

};

class Axis : public Bank {

public:

float getRateOfInterest() override {

return 9.7f;

}

};

class ICICI : public Bank {

public:

float getRateOfInterest() override {

return 7.3f;

}

};

int main() {

SBI sbi;

Axis axis;

ICICI icici;

sbi.displayInfo("SBI");

axis.displayInfo("Axis");

icici.displayInfo("ICICI");

return 0;

}

OUTPUT:

Bank Name: SBI

Interest Rate: 8.4%

Bank Name: Axis

Interest Rate: 9.7%

Bank Name: ICICI

Interest Rate: 7.3%

**2. WRITE DOWN SOURCE FOR THE EXCEPTIONS FOR FOLLOWING SNIPPETS,**

**• Separation of Error Handling code from Normal Code**

**• Functions/Methods can handle any exceptions**

**• Notes on Catch all**

**• If an exception is thrown and not caught anywhere, the program terminates abnormally**

#include <iostream>

#include <stdexcept>

using namespace std;

double divideNumbers(double dividend, double divisor) {

if (divisor == 0) {

throw runtime\_error("Division by zero exception");

}

return dividend / divisor;

}

void performOperation() {

try {

double result = divideNumbers(10, 0);

cout << "Result of division: " << result << endl;

} catch (const exception& ex) {

cerr << "Error: " << ex.what() << endl;

throw;

}

}

int main() {

try {

performOperation();

} catch (const exception& ex) {

cerr << "Exception caught in main: " << ex.what() << endl;

} catch (...) {

cerr << "Unknown exception caught in main" << endl;

}

return 0;

}

OUTPUT:  
Error: Division by zero exception

Exception caught in main: Division by zero exception

**3. Write down the C++ for Students Report with the implementation of Virtual Function.**

#include <iostream>

#include <string>

#include <vector>

using namespace std;

class Student {

protected:

string name;

int rollNumber;

public:

Student(const string& n, int roll) : name(n), rollNumber(roll) {}

virtual void displayDetails() const {

cout << "Name: " << name << endl;

cout << "Roll Number: " << rollNumber << endl;

}

virtual void calculateMarks() const = 0;

};

class ScienceStudent : public Student {

protected:

float physicsMarks;

float chemistryMarks;

float biologyMarks;

public:

ScienceStudent(const string& n, int roll, float phy, float chem, float bio)

: Student(n, roll), physicsMarks(phy), chemistryMarks(chem), biologyMarks(bio) {}

void displayDetails() const override {

cout << "Science Student Details:" << endl;

Student::displayDetails();

cout << "Physics Marks: " << physicsMarks << endl;

cout << "Chemistry Marks: " << chemistryMarks << endl;

cout << "Biology Marks: " << biologyMarks << endl;

}

void calculateMarks() const override {

float totalMarks = physicsMarks + chemistryMarks + biologyMarks;

cout << "Total Marks (Science): " << totalMarks << endl;

}

};

class ArtsStudent : public Student {

protected:

float historyMarks;

float geographyMarks;

float politicalScienceMarks;

public:

ArtsStudent(const string& n, int roll, float hist, float geo, float polSci)

: Student(n, roll), historyMarks(hist), geographyMarks(geo), politicalScienceMarks(polSci) {}

void displayDetails() const override {

cout << "Arts Student Details:" << endl;

Student::displayDetails();

cout << "History Marks: " << historyMarks << endl;

cout << "Geography Marks: " << geographyMarks << endl;

cout << "Political Science Marks: " << politicalScienceMarks << endl;

}

void calculateMarks() const override {

float totalMarks = historyMarks + geographyMarks + politicalScienceMarks;

cout << "Total Marks (Arts): " << totalMarks << endl;

}

};

int main() {

ScienceStudent scienceStudent("John Doe", 101, 85.5, 78.9, 92.3);

ArtsStudent artsStudent("Jane Smith", 102, 79.8, 88.2, 90.5);

scienceStudent.displayDetails();

scienceStudent.calculateMarks();

cout << endl;

artsStudent.displayDetails();

artsStudent.calculateMarks();

return 0;

}

OUTPUT:  
Science Student Details:

Name: John Doe

Roll Number: 101

Physics Marks: 85.5

Chemistry Marks: 78.9

Biology Marks: 92.3

Total Marks (Science): 256.7

Arts Student Details:

Name: Jane Smith

Roll Number: 102

History Marks: 79.8

Geography Marks: 88.2

Political Science Marks: 90.5

Total Marks (Arts): 258.5