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**INTERNSHIP TASK 3**

**CODE:**

#include <iostream>

#include <string>

#include <fstream>

#include <stdexcept>

using namespace std;

string readFile(const string& fileName) {

ifstream file(fileName, ios::in | ios::binary);

if (!file) {

throw runtime\_error("File cannot be opened or read");

}

string content((istreambuf\_iterator<char>(file)), istreambuf\_iterator<char>());

return content;

}

void writeFile(const string& fileName, const string& data) {

ofstream file(fileName, ios::out | ios::binary);

if (!file) {

throw runtime\_error("File cannot be opened or written");

}

file.write(data.c\_str(), data.size());

}

string compressRLE(const string& data) {

string compressed;

int n = data.size();

for (int i = 0; i < n; ++i) {

int count = 1;

while (i + 1 < n && data[i] == data[i + 1]) {

++i;

++count;

}

compressed += data[i];

compressed += to\_string(count);

}

return compressed;

}

string decompressRLE(const string& data) {

string decompressed;

int n = data.size();

for (int i = 0; i < n; ++i) {

char ch = data[i];

string countStr;

while (i + 1 < n && isdigit(data[i + 1])) {

countStr += data[++i];

}

int count = stoi(countStr);

decompressed.append(count, ch);

}

return decompressed;

}

int main() {

string inputFileName, outputFileName;

char choice;

cout << "Enter input filename: ";

cin >> inputFileName;

cout << "Choose option:" << endl;

cout << "(c) Compress file or (d) Decompress file: ";

cin >> choice;

if (choice == 'c' || choice == 'C') {

try {

string data = readFile(inputFileName);

string compressedData = compressRLE(data);

outputFileName = inputFileName + ".rle";

writeFile(outputFileName, compressedData);

cout << "File compressed successfully: " << outputFileName << endl;

}

catch (const exception& e) {

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

}

}

else if (choice == 'd' || choice == 'D') {

try {

string data = readFile(inputFileName);

string decompressedData = decompressRLE(data);

outputFileName = inputFileName + ".decompressed";

writeFile(outputFileName, decompressedData);

cout << "File decompressed successfully: " << outputFileName << endl;

}

catch (const exception& e) {

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

}

}

else {

cout << "Invalid choice" << endl;

}

return 0;

}

