

ENGG1340 Computer Programming II
COMP2113 Programming Technologies
Module 7 Self-Review Exercise

1. Assume that each of the following statement applies to the same program.
 - a) Write a statement that opens file `transaction.dat` for input; use an `ifstream` object called `inTransaction`.
 - b) Write a statement that opens file `balance.dat` for input; use an `ifstream` object called `inBalance`.
 - c) Write a statement that reads integer `accountNumber`, floating-point amount from the file `transaction.dat`; use `ifstream` object `inTransaction`.
 - d) Write a statement that reads integer `accountNumber`, string `name`, floating-point `currentBalance` from the file `balance.dat`; use `ifstream` object `inBalance`.
 - e) Write a statement that writes integer `accountNumber`, string `name`, updated balance which is a floating-point `currentBalance + amount` to the file `balance.dat`; use `ifstream` object `inBalance`.
2. Suppose that `numStudents` is an `int` variable and `classCode` is a `string` variable. What are the values of `numStudents` and `classCode` after the following input statements execute:

```
cin >> numStudents;  
getline(cin, classCode);
```

if the input is:

- (a) 80 ENGG1111
- (b) 80
ENGG1111

3. The following program is supposed to read two numbers from a file named `numbers.dat` and write the product of the numbers to a file named `product.dat`. However, it fails to accomplish the task. Fix by rewriting the program so that it performs what it is supposed to do.

```
#include <iostream>  
#include <fstream>  
using namespace std;  
  
int main()  
{  
    int num1, num2;  
    ifstream infile;  
  
    outfile.open("product.dat");  
    infile >> num1 >> num2;  
    outfile << "Product = " << num1 * num2 << endl;  
    return 0;  
}
```

4. Consider the following statements:

```
struct movieType
{
    string title;
    string genre;
    int year;
    double rating;
};
movieType    movies[100];
movieType    oldMovie;
```

State if each of the following statements is valid or invalid. If a statement is invalid, explain why.

- (a) `cout << oldMovie.name;`
- (b) `movies.year = 2015;`
- (c) `movies[11] = oldMovie;`
- (d) `oldMovie.title = "Titanic";`
- (e) `if (movies[99].genre == "drama")`
 `movies[99].rating = 3.5;`

5. The following program calculates the summation of first n natural numbers. E.g., *if $n = 6$, $sum = 1 + 2 + 3 + 4 + 5 + 6 = 21$* . Rewrite the `sum()` that uses recursion to calculate and return the sum of first n .

```
#include <iostream>
using namespace std;

// iterative version
int sum(int n)
{
    int sum = 0;
    for (int i = 1; i <= n; ++i)
        sum += i;
    return sum;
}

int main()
{
    int n;

    cout << "Enter a positive integer: ";
    cin >> n;

    cout << "Sum of first " << n << " natural numbers = " << sum(n) << endl;

    return 0;
}
```