

CS173: Intermediate Computer Science

Reading 9

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Read the assigned pages below from our course textbook. Complete the responses to the questions in this document and then save as a docx or pdf file. Submit your work by the assigned deadline on the Canvas course page. Responses may be neatly handwritten or typed.

Put your name at the top!

Readings:

Read Chapter 10.1 – 10.6

You should come away with understanding:

- How the sizeof and the limits of datatypes can be used.
- How to use a typedef to create a synonym for a datatype.
- The difference between simple and structured datatypes.
- What a struct is and how to use it.

1) What kind of information is available in #include<limits>?

limits header file provides information of maximum and minimum values for the machine that the user is using. This header file defines the constants CHAR_MAX and CHAR_MIN, SHRT_MAX and SHRT_MIN, INT_MAX and INT_MIN, and LONG_MAX and LONG_MIN.

2) What does the sizeof() function do?

sizeof() function returns the size of a value of type.

3) What does typedef allow you to do?

The typedef statement allows us to introduce a new name for an existing type.

4) What does enum allow you to do? Give an example.

enum allows the user to define a new simple type by listing (enumerating) the literal values that make up the domain of the type. For example,

```
enum winter_months = {Dec, Jan, Feb};
```

This declaration creates a new data type named winter_months.

5) What distinguishes a structured datatype from a simple datatype? List the four different kinds of structured datatypes.

A value in a simple type cannot be broken into component parts. In contrast, in a structured data type, each value is a collection of component items.

There are four different kinds of structured datatypes including array, struct, union, and class.

6) Consider the C++ code below.

```
const int NUM_QUIZZES = 10;

struct StudentRecord
{
    string    name;
    int       quizzes[NUM_QUIZZES];
    int       final_exam;
    float     average;
};

StudentRecord s1;
s1.name = "Sally";
```

(a) Write a statement below which will assign the grade of 80 to Sally's third quiz grade:

```
s1.quizzes[2] = 80;
```

(b) Write a statement below which will assign the grade of 90 to Sally's final exam score:

```
s1.final_exam = 90;
```

(c) Write a series of statements below which will compute Sally's overall course average and assign it to "average" in her struct record as

50% of the average quiz grade (over all 10 quizzes) + 50% of the final exam score

```
int quizSum = 0;
for (int i = 0; i < NUM_QUIZZES; i++) {
    quizSum += s1.quizzes[i];
}

float quizAvr = quizSum / NUM_QUIZZES;

s1.average = 0.5*quizAvr+0.5*s1.final_exam;
```