

Homework 3

1) Which of the following two ways of declaring a structure and variable is correct:

<pre>(i) struct PayInformation { float pay; float benefits; float deductions; }; struct Employee { string name; PayInformation payInfo; }; Employee emp;</pre>	<pre>(ii) struct Employee { string name; float pay; float benefits; float deductions; }; Employee emp;</pre>
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- a) (i) is correct, but (ii) is not.
- b) both (i) and (ii) are correct.
- c) both are correct, but (i) is more memory efficient.
- d) (ii) is correct, but (i) is not.

2) In solution (i) to question 1 above, which of the following is the correct way to access the data stored in `pay`?

- a) `Employee.payInfo.pay`
- b) `Employee.PayInformation.pay`
- c) `emp.payInfo.pay`
- d) `emp.PayInformation.pay`
- e) `emp.pay`.

3) Is the following way of declaring a struct variable `student` valid?

```
struct studentInfo
{
    string name;
    float GPA;
} student;
```

- a) Yes
- b) No
- c) Maybe – it depends on the compiler.

- 4) For the following array declaration, which of the following accesses to elements in the array are valid?

```
int studentArray[100];
```

- a) studentArray[0]
 - b) studentArray[100]
 - c) studentArray[50]
 - d) a, b, and c
 - e) both a and c
- 5) Which of the following are valid parameter passing mechanisms for arrays?
- a) pass by value
 - b) pass by reference
 - c) a and b
 - d) None of the above
- 6) What is the difference between a two-dimensional array and two parallel arrays?
- a) A two-dimensional array is used to represent a grid structure whereas two parallel arrays consist of two 1-dimensional arrays that are related to each other semantically
 - b) Both are the same, they are just different terminology for the same thing.
 - c) A two-dimensional array must contain the same data type in all of its elements, whereas each parallel array could contain a different type
 - d) Both a and c
 - e) None of the above
- 7) Which of the following is the correct function prototype for a function that accepts a 2-dimensional integer array that is of size array[3][3]?
- a) void func(int array[][3]);
 - b) void func(int array[3][]);
 - c) void func(int array[][]);
 - d) void func(int array[]);

The next three questions use the following definitions:

```
struct studentInfo
{
    string firstName;
    string lastName;
    int    projectMarks[5];
    int    hwMarks[4];
};
studentInfo student[50];
```

8) In order to search for a student whose first name is "John", which of the following algorithms should I use?

```
a) for (int i=0; i<MAX_STUDENTS; i++)
    if (student[i].firstName == "John")
        cout << "Student is enrolled" << endl;
    cout << "Student is not enrolled" << endl;
```

```
b) bool flag = false;
for (int i=0; i<MAX_STUDENTS; i++)
    if (student[i].firstName == "John")
    {
        cout << "Student is enrolled" << endl;
        flag = true;
    }
if (flag == false)
    cout << "Student is not enrolled" << endl;
```

```
c) for (int i=0; i<MAX_STUDENTS; i++)
    {
        bool flag = false;
        if (student[i].firstName == "John")
        {
            cout << "Student is enrolled" << endl;
            flag = true;
        }
    }
if (flag == false)
    cout << "Student is not enrolled" << endl;
```

d) All of the above

- 9) Which code will access the 4th project marks of the 45th student in the class?
- a) `student[45].projectMarks[3]`
 - b) `student[44].projectMarks[3]`
 - c) `student[44].projectMarks[4]`
 - d) `studentInfo[44].projectMarks[3]`

10) What term is the *best* way to describe student above?

- a) An array of structures
- b) A structure containing arrays
- c) An array of structures that has other arrays as elements of the structure
- d) An array of an array of structures