Homework 3

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

```
(i) struct PayInformation
    {
      float pay;
      float benefits;
      float deductions;
    };
    struct Employee
    {
      string name;
      PayInformation payInfo;
    };
    Employee emp;
```

```
(ii) struct Employee
     {
       string name;
       float  pay;
       float  benefits;
       float  deductions;
     };
     Employee emp;
```

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