Lecture 14.1

Revision I

Arrays

- What would the following segment of C++ code print?

```
#define MAXI 50
#define MAXJ 75
int i , j ;
float values[ MAXI ][ MAXJ ];
for (i = 0; i < MAXI; i++) {
    for (j = 0; j < MAXJ; j++) {
      values[ i ] [ j ] = i+j; } }
cout<<values[i-1][j-1]<<endl;
```

Answer

- 123

Pointer

- What would the following segment of C++ code print?

```
#define MAXI 50
#define MAXJ 75
int i , j ;
float *ptr;
float values[ MAXI ][ MAXJ ];
for (i = 0; i < MAXI; i++) {
    for (j = 0; j < MAXJ; j++) {
      values[ i ] [ j ] = i+j; } }
ptr = &values[i-1][j-1];
cout<<*ptr<<endl;
```

Answer

- 123

Classes

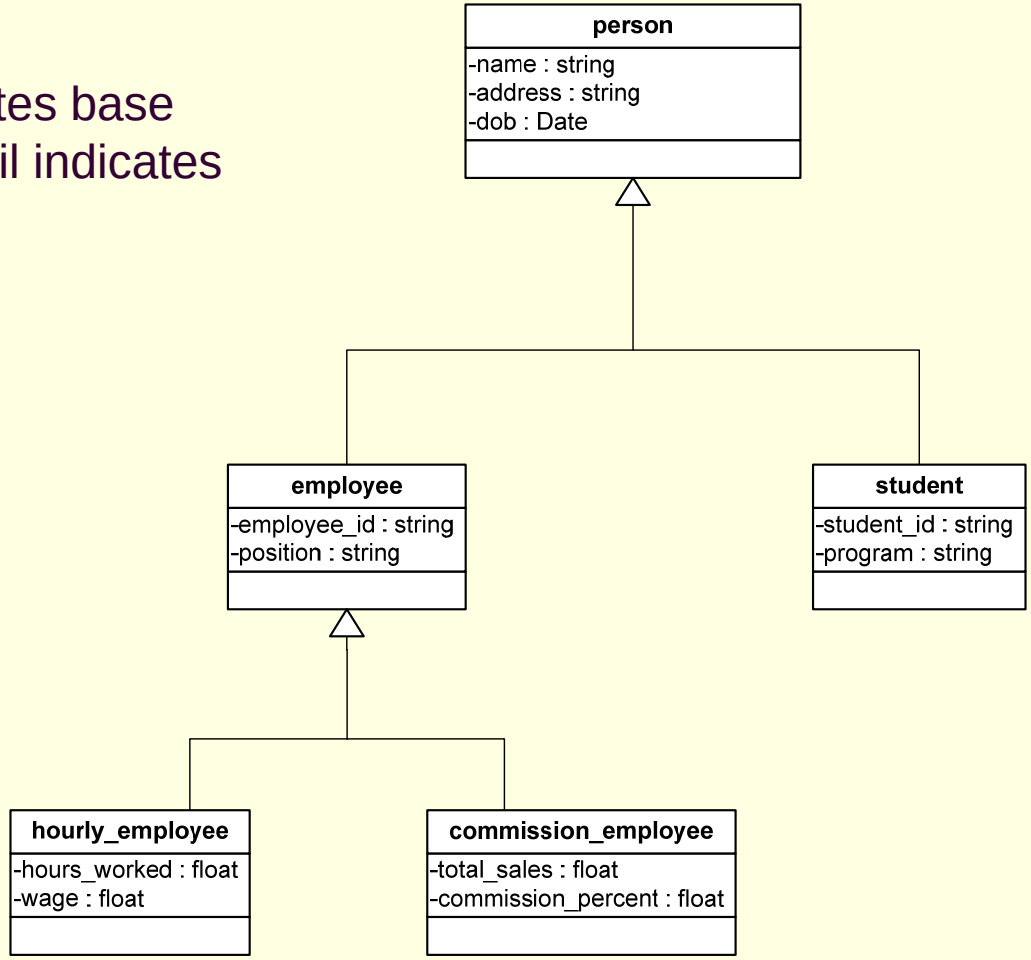
- What is the difference between public and protected members?

- A hierarchical relationship can be made using inheritance relationships.

  An example is shown in the next slide where hourly_employee class and commission employee class inherit from employee class. employee and student class inherit from person class.

Inheritance representation

Arrow head indicates base class and arrow tail indicates derived class.



Question

- Using the example shown in previous slide write a code in C++ for all the classes related by inheritance relationships.

Answer: person class

```
class person{
    public:
        person();
        …
    private:
        string name;
        string address;
        string dob;
};
```

employee and student class

```
class employee: public person{
    public:
      employee();
      …
    private:
      string employee_id
      string position;
};
class student: public person{
    public:
      student();
      …
    private:
      string student_id;
      string program;
};
```

hourly_employee and commission_employee classes

```
Class hourly_employee: public employee{
    public:
        hourly_employee();
        …
    private:
        float hours_worked:
        float wage;
};

Class commission_employee: public employee{
    public:
        commission_employee();
        …
    private:
        float total_sales;
        float commission_percent;
};
```

Growth rate (time complexity)

- Find the Big O of the following expression:

  $f(n) = 6n^2+20n+100$

Answer

Ans: $O(n^2)$