*Notes 11/24*

Suppose I wanted to write code for my company to keep track of employees.

Int main()  
{  
 Company myCompany;  
 myCompany.hire(“Lucy”, 60000, 32);  
 myCompany.hire(“Ricky”, 50000, 42);  
…  
}  
  
class Employee  
{  
 public:  
 Employee(string nm, double sal, int a);  
 void recieveBonus() const;  
 …  
 private:  
 string m\_name;  
 double m\_salary;  
 int m\_age;  
 Company\* m\_company;  
};  
  
Employee::Employee(string nm, double sal, int a, Company\* cp) //initializes the employee with the passed values  
{  
 m\_name = nm;  
 m\_salary = sal;  
 m\_age = a;  
 m\_company = cp;  
}  
  
Now we have a problem: we want to create a Company class that initializes an array to hold the various employees, but employee does not have a default constructor with no arguments – each element of the array would require a name, salary, and age.

Instead we can create an array of pointers to employees and then dynamically create each element as we get to it. Each employee will be a new, dynamically created element.  
  
class Company  
{  
 public:  
 Company();  
 void hire(string name, double sal, double age);  
 void setBonus(double pct);  
 double bonusRate() const;  
 private:  
 Employee\* m\_employees[100] //max employees is 100 in this case.  
 int m\_nEmployees;  
 double m\_bonusRate;  
};  
  
Now we implement the hire function to create new employees in the array.  
  
void Company::hire(string name, double sal, int age)  
{  
 m\_employees[m\_nEmployees] = new Employee(name, sal, age, *this*); //you use a new Employee, dynamically allocated, so it will stick around after the function ends.  
 nEmployees++;  
}  
  
If we want to have the functionality to give bonuses, we can implement it as so:

Void Company::setBonusRate(double pct)  
{  
 m\_bonusRate = pct;  
}  
  
double Company::bonusRate() const  
{  
 return m\_bonusRate;  
}  
  
You can add a line into main to set the bonus as a percentage of a salary, and then compute the bonus for each individual employee. To do this you use the pointer in each Employee that points back to the company that “hired” them.

Void Employee::receiveBonus() const  
{  
 cout << “Pay to “ << m\_name << “ the amount $” << m\_salary \* m\_company->bonusRate();  
 //last bit follows the pointer back to the company that hired the employee and  
 //checks what this company’s bonus rate is  
}