EE209 Spring 2018 C++ Sample Exam

1. Access control

Suppose we have the following C++ code.

```
#include <iostream>
using namespace std;

class Parent {
  virtual void print()
  {
    cout << "Parent name " << _name << endl;
  }

 protected:
  char* _name;
};

class Child : public Parent {

 public:
  Child(char* name = "KIM")
    : _name(name) {}

  void print()
  {
    cout << "Child name " << _name << endl;
  }
};

int main() {
  Parent* myRecord = new Child();
  myRecord->print();
  delete myRecord;
  return 0;
}
```

(a) Find all the bugs in this code.

(b) Once the bugs are fixed, what is the output of the code?

(c) Suppose we fixed the bugs, but now want to add the line

```
cout << myRecord->_name << endl;
```

in the main() function. What change in the above classes can we make to avoid introducing a new error?

2. Function overloading

What is the output of the following C++ code?

```
#include <iostream>
using namespace std;

class Animal {};

class Fish : public Animal {};

class JellyFish : public Fish {};

class Squid : public Fish {};

void whichone(Animal animal) {
  cout << "Animal" << endl;
}

void whichone(Squid squid) {
  cout << "Squid" << endl;
}

int main() {
  Squid squid;
  whichone(squid);

  Fish fish;
  whichone(fish);

  JellyFish jellyfish;
  whichone(jellyfish);

  whichone(*(Squid*)&jellyfish);

  return 0;
}
```

Output: