

Problem Set 6

Sample Solution.

Problem 1

The following C++ code may contain illegal statements.

- Identify the illegal statements in the main program by underlining them in the program listing. Give a justification why you think the eliminated statement is illegal.
- Ignoring the illegal statements, show the output of the program.

```
#include <stream.h>

class Animal
{ public:
  Animal() { isA = 'A'; };
  void display() { draw(); };
protected:
  virtual void draw () = 0;
  char isA;
};

class Bear : public Animal
{
  public:
  Bear() { isA = 'B'; };
  void draw () { cout << "ANIMAL: " << isA << "\n"; };
  private:
  void print() { cout << "ANIMAL: " << isA << "\n"; };
};

main()
{
  Bear *b = new Bear();
  Animal *c = new Animal();
  Animal *d;

  b->display();
  c->display();
  b->draw();
  b->print();
  d = b;
  d->display();
};
```

Sample Solution:

Well, just run the code and check!

Problem 2

Give a C++ code example where the binding of a virtual function cannot be resolved at compile time.

```
#include<stream.h>

class Aircraft {
public:
    virtual void print() = 0;
};

class Blimb : public Aircraft {
public:
    void print() { cout << "Blimb";};
};

class Glider : public Aircraft {
public:
    void print() { cout << "Glider";};
};

main() {

    Aircraft *a;
    Blimb *b = new Blimb;
    Glider *g = new Glider;

    if ( ??? )
        a = b;
    else
        a = g;

    a->print();
}
```

The code above evaluates the condition “???” which we assume cannot be determined at compile time. Based on the resulting value, pointer variable *a* either points to a *Blimb* or *Glider* object. Therefore, the actual type of the *Aircraft* object in the statement $a \rightarrow print()$ cannot be determined at compile time.