CECS 282
Week 4 - Lab 1
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Code:

main

```
//Authors: Taylor Girard, Evan Haut, Kenry Yu
//Contributions:
// Evan Haut: Main
// Taylor Girard: setAltitude(), crash()
// Kenry Yu: I set up the header file, both default and overload constructor, and the display function.

#include <iostream>
#include "Airplane.h"
#include <time.h>
using namespace std;

int main() {
  srand(time(NULL));
  double numCrashed = 0;
  Airplane plane1 = Airplane("B17", 600, 500, 2000);
  Airplane plane2 = Airplane("MH340", 700, 200, 1500);
  for(int i = 0; i < 1000; i++)
  {
    if(plane1.crash(plane2))
    {
      plane1.display();
      plane2.display();
      cout << endl;
      numCrashed++;
    }
    plane1.setAltitude();
    plane2.setAltitude();
  }

  double percent = numCrashed / 10;
  cout << "Crashed a total of " << numCrashed << " times, or " << percent << "%.";
}
```

Airplane.h

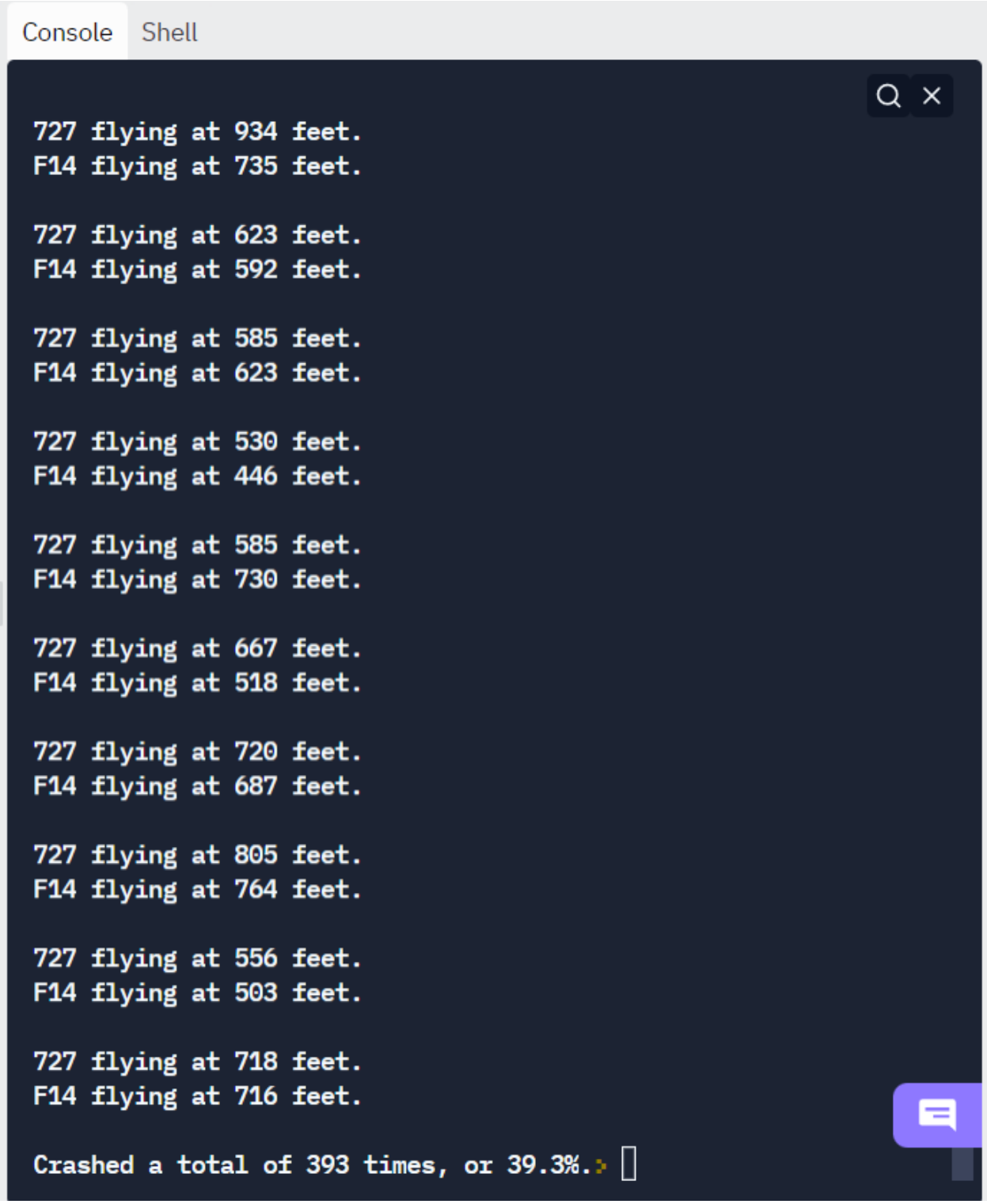
```
#ifndef AIRPLANE_H
#define AIRPLANE_H
#include <string>

class Airplane{
private:
std::string model;
int altitude;
int minAltitude;
int maxAltitude;

public:
Airplane();
Airplane(std::string name, int height, int minAl, int maxAl);
void display();
void setAltitude();
bool crash(Airplane plane);
int getAltitude();
};

#endif
```

Airplane.cpp

```
#include "Airplane.h"
#include <iostream>
using namespace std;

Airplane::Airplane(){
  this->model = "N/A";
  this->altitude = 0;
  this->minAltitude = 0;
  this->maxAltitude = 0;
};

Airplane::Airplane(string name, int height, int minAl, int maxAl){
  this->model = name;
  this->altitude = height;
  this->minAltitude = minAl;
  this->maxAltitude = maxAl;
};
```

```
//Displays the model and altitude
void Airplane::display(){
  cout << this->model <<" flying at "<< this->altitude<<" feet.\n";
};

//Sets the altitude to a random value between the max and min altitude
void Airplane::setAltitude(){

  int temp_altitude = rand() % (this->maxAltitude - this->minAltitude) + this->minAltitude;

this->altitude = temp_altitude;

};

//Returns the planes altitude
int Airplane::getAltitude(){

return altitude;

};

bool Airplane::crash(Airplane plane){

if (abs(this->altitude - plane.getAltitude()) < 200){

  return true;

}

  return false;

}
```

Outputs:


Console
Shell
727 flying at 934 feet.
F14 flying at 735 feet.
727 flying at 623 feet.
F14 flying at 592 feet.
727 flying at 585 feet.
F14 flying at 623 feet.
727 flying at 530 feet.
F14 flying at 446 feet.
727 flying at 585 feet.
F14 flying at 730 feet.
727 flying at 667 feet.
F14 flying at 518 feet.
727 flying at 720 feet.
F14 flying at 687 feet.
727 flying at 805 feet.
F14 flying at 764 feet.
727 flying at 556 feet.
F14 flying at 503 feet.
727 flying at 718 feet.
F14 flying at 716 feet.
Crashed a total of 393 times, or 39.3%.

Console Shell

```
B17 flying at 1243 feet.
MH340 flying at 1202 feet.

B17 flying at 1264 feet.
MH340 flying at 1368 feet.

B17 flying at 657 feet.
MH340 flying at 512 feet.

B17 flying at 1291 feet.
MH340 flying at 1270 feet.

B17 flying at 1060 feet.
MH340 flying at 925 feet.

B17 flying at 566 feet.
MH340 flying at 688 feet.

B17 flying at 505 feet.
MH340 flying at 694 feet.

B17 flying at 1166 feet.
MH340 flying at 1266 feet.

B17 flying at 672 feet.
MH340 flying at 748 feet.

B17 flying at 915 feet.
MH340 flying at 875 feet.

Crashed a total of 192 times, or 19.2%.
```