

```

1 #include "NumToString.h"
2 #include <iostream>
3 using namespace std;
4
5 int main()
6 {
7     int testCases[][3] = {
8         {14, 30, 45},    // Valid
9         {23, 59, 59},    // Valid
10        {24, 0, 0},       // Invalid hour
11        {12, 60, 0},      // Invalid minute
12        {12, 30, 60},     // Invalid second
13        {25, 60, 20},     // Invalid hour and minute
14        {26, 70, 60},     // Invalid hour, minute and second
15    };
16
17    for (int i=0; i<7; i++){
18        int *subarray = testCases[i];
19        cout << "Case " << i+1 << ": ";
20        NumToString NTS(subarray[0], subarray[1], subarray[2]);
21        NTS.conversion();
22        cout << endl;
23    }
24
25    return 0;
26 }
27

```

```

1 #include <stdexcept>
2 using namespace std;
3
4 class HourError : public runtime_error{
5     public:
6         HourError() : runtime_error("The 'hour' value is invalid."){};
7 };
8

```

```

1 #include <stdexcept>
2 using namespace std;
3
4 class MinuteError : public runtime_error{
5     public:
6         MinuteError() : runtime_error("The 'minute' value is invalid."){};
7 };
8

```

```

1 #include <stdexcept>
2 using namespace std;
3
4 class SecondError : public runtime_error{
5     public:
6         SecondError() : runtime_error("The 'second' value is invalid."){};
7 };
8

```

```
1  #ifndef NUMTOSTRING_H
2  #define NUMTOSTRING_H
3
4  class NumToString{
5      public:
6          NumToString();
7          NumToString(int, int, int);
8
9          void conversion() const;
10
11          int getHour() const;
12          int getMinute() const;
13          int getSecond() const;
14
15      private:
16          int hour;
17          int minute;
18          int second;
19
20          void setHour(int);
21          void setMinute(int);
22          void setSecond(int);
23  };
24
25  #endif
```

```

1  #include "HR_error.h"
2  #include "Min_error.h"
3  #include "Sec_error.h"
4  #include "NumToString.h"
5  #include <iostream>
6  using namespace std;
7
8  NumToString::NumToString(){}
9
10 NumToString::NumToString(int hr, int min, int sec) : hour(0), minute(0), second(0){
11     setHour(hr);
12     setMinute(min);
13     setSecond(sec);
14 }
15
16 void NumToString::conversion() const{
17     if (hour > 0 and hour < 24 and minute > 0 and minute < 60 and second > 0 and second < 60)
18         cout << hour << " hours, " << minute << " minutes, and " << second << " seconds" << endl;
19 }
20
21 void NumToString::setHour(int hr){
22     try{
23         if (hr < 0 or hr > 23){
24             throw HourError();
25         }
26         hour = hr;
27     }
28     catch(HourError &hourError){
29         cout << "Exception occurred: " << hourError.what() << endl;
30     }
31 }
32
33 void NumToString::setMinute(int min){
34     try{
35         if (min < 0 or min > 59){
36             throw MinuteError();
37         }
38         minute = min;
39     }
40     catch(MinuteError &minuteError){
41         cout << "Exception occurred: " << minuteError.what() << endl;
42     }
43 }
44
45 }

```

```

46
47 void NumToString::setSecond(int sec){
48     try{
49         if (sec < 0 or sec > 59){
50             throw SecondError();
51         }
52         second = sec;
53     }
54     catch(SecondError &secondError){
55         cout << "Exception occurred: " << secondError.what() << endl;
56     }
57 }
58
59
60 int NumToString::getHour() const{
61     return hour;
62 }
63
64 int NumToString::getMinute() const{
65     return minute;
66 }
67
68 int NumToString::getSecond() const{
69     return second;
70 }

```

```
Case 1: 14 hours, 30 minutes, and 45 seconds
Case 2: 23 hours, 59 minutes, and 59 seconds
Case 3: Exception occurred: The 'hour' value is invalid.
Case 4: Exception occurred: The 'minute' value is invalid.
Case 5: Exception occurred: The 'second' value is invalid.
Case 6: Exception occurred: The 'hour' value is invalid.
Exception occurred: The 'minute' value is invalid.
Case 7: Exception occurred: The 'hour' value is invalid.
Exception occurred: The 'minute' value is invalid.
Exception occurred: The 'second' value is invalid.
```