

Coursework-3: OPP in C++

TASK – 1



Submitted by

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Task 1 :

1. Create a `Time` class to store hours and minutes. Implement:
 1. Overload the `+` operator to add two `Time` objects
 2. Overload the `>` operator to compare two `Time` objects
 3. Handle invalid time (`>24` hours or `>60` minutes) by throwing a custom exception

```
2. #include <iostream>
3.
4. #include <stdexcept>
5.
6. using namespace std;
7.
8. class Time
9. {
10.     {
11.         int hour, minute;
12.
13.         void validate()
14.         {
15.             if (hour < 0 || hour >= 24 || minute < 0 || minute >= 60)
16.             {
17.
18.                 throw invalid_argument("INVALID INPUT!!! Eter between 0
19. and 23, minutes between 0 and 59.");
20.
21.             }
22.         }
23.     }
24.
25. public:
26.
27.     Time(int h = 0, int m = 0)
28.     {
29.         hour = h;
30.
31.
```

```

32.         minute = m;
33.
34.         validate();
35.     }
36.
37.     void display()
38.     {
39.
40.
41.         cout << "    " << hour << " hour(s) " << minute << "
minute(s)" << endl;
42.     }
43.
44.     Time operator+(Time& t)
45.     {
46.         Time temp;
47.
48.         temp.hour = hour + t.hour;
49.
50.         temp.minute = minute + t.minute;
51.
52.         if (temp.minute >= 60)
53.         {
54.
55.             temp.hour += temp.minute / 60;
56.
57.             temp.minute = temp.minute % 60;
58.         }
59.
60.         if (temp.hour >= 24)
61.         {
62.
63.             temp.hour = temp.hour % 24;
64.         }
65.
66.         temp.validate();
67.         return temp;
68.     }
69.
70.
71.
72.
73.     bool operator>(Time& t)
74.
75.     {

```

```
76.         if (hour > t.hour)
77.
78.             {
79.
80.                 return true;
81.             }
82.
83.         else if (hour == t.hour && minute > t.minute)
84.
85.             {
86.
87.                 return true;
88.             }
89.
90.         return false;
91.     }
92. };
93.
94. int main()
95.
96.     {
97.         try
98.
99.             {
100.                 int h1, m1, h2, m2;
101.
102.                 cout << "-----"
103. " << endl;
104.
105.                 cout << "Enter Time 1:" << endl;
106.
107.                 cout << "    Hours: ";
108.
109.                 cin >> h1;
110.
111.                 cout << "    Minutes: ";
112.                 cin >> m1;
113.
114.                 cout << "-----" <<
endl;
115.
116.                 cout << "Enter Time 2:" << endl;
117.                 cout << "    Hours: ";
118.                 cin >> h2;
```

```

119.         cout << "    Minutes: ";
120.         cin >> m2;
121.         cout << "-----" <<
endl;
122.
123.         Time t1(h1, m1);
124.         Time t2(h2, m2);
125.
126.         cout << "\nTime 1: ";
127.         t1.display();
128.
129.         cout << "\n-----"
<< endl;
130.         cout << "\nTime 2: ";
131.         t2.display();
132.
133.         Time sum = t1 + t2;
134.
135.         cout << "\n-----"
<< endl;
136.         cout << "\nSum of Time 1 and Time 2: ";
137.         sum.display();
138.
139.         cout << "\n-----"
<< endl;
140.         if (t1 > t2)
141.         {
142.
143.             cout << "Time 1 is greater than Time 2" << endl;
144.
145.         }
146.
147.         else
148.         {
149.
150.             cout << "Time 2 is greater than or equal to Time 1"
<< endl;
151.
152.         }
153.
154.         cout << "-----" <<
endl;
155.
156.         cout << "-----" <<
endl;
157.     }

```

```
158.         catch (const invalid_argument& e)
159.
160.         {
161.
162.             cout << "Error: " << e.what() << endl;
163.
164.         }
165.
166.         return 0;
167.     }
168.
```



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Enter Time 1:

Hours: 23

Minutes: 44

Enter Time 2:

Hours: 21

Minutes: 34

Time 1: 23 hour(s) 44 minute(s)

Time 2: 21 hour(s) 34 minute(s)

Sum of Time 1 and Time 2: 21 hour(s) 18 minute(s)

Time 1 is greater than Time 2

Process returned 0 (0x0) execution time : 20.068 s
Press any key to continue.
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