BIS 420 PROGRAMMING FOR DATA SCIENCE

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CHAPTER 17 EXERCISE 17.6
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Download the code from this chapter (http: // thinkpython. com/ code/Time2. py). Change the attributes of Time to be a single integer representing seconds since midnight. Then modify the methods (and the function int_to_time) to work with the new implement tation. You should not have to modify the test code in main. When you are done, the output should be the same as before. Solution: http: // thinkpython. com/ code/ Time2_ soln. py

```
class Time:
    def __init__(self, hour=0, minute=0, second=0):

        self.seconds = hour * 3600 + minute * 60 + second

    def __str__(self):
        return int_to_time(self.seconds)

    def time_to_int(self):
        return self.seconds

    def __add__(self, other):

        return Time.from_seconds(self.seconds + other.seconds)

    @staticmethod
    def from_seconds(seconds):

        return Time(0, 0, seconds)
```

```
def int_to_time(seconds):
    hour = seconds // 3600
    seconds %= 3600
    minute = seconds // 60
    second = seconds % 60
    return f'{hour:02}:{minute:02}:{second:02}'

def time_to_int(time):
    return time.seconds

def increment(time, seconds):

    return Time.from_seconds(time.time_to_int() + seconds)

def main():
    start = Time(9, 45, 30)
    print("Start time:", start)

    incremented_time = increment(start, 1500)
    print("Incremented time:", incremented_time)

    time1 = Time(1, 30, 15)
    time2 = Time(2, 15, 0)


    print("Time1 in seconds:", time1.time_to_int())
```

```
    print("Time2 in seconds:", time2.time_to_int())

    added_time = time1 + time2
    print("Added time:", added_time)

if __name__ == "__main__":
    main()
```

```
class Time:
    def __init__(self, hour=0, minute=0, second=0):

        self.seconds = hour * 3600 + minute * 60 + second

    def __str__(self):
        return int_to_time(self.seconds)

    def time_to_int(self):
        return self.seconds

    def __add__(self, other):

        return Time.from_seconds(self.seconds + other.seconds)

    @staticmethod
    def from_seconds(seconds):

        return Time(0, 0, seconds)

def int_to_time(seconds):
    hour = seconds // 3600
    seconds %= 3600
    minute = seconds // 60
    second = seconds % 60
    return f'{hour:02}:{minute:02}:{second:02}'

def time_to_int(time):
    return time.seconds

def increment(time, seconds):

    return Time.from_seconds(time.time_to_int() + seconds)
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def main():
    start = Time(9, 45, 30)
    print("Start time:", start)

    incremented_time = increment(start, 1500)
    print("Incremented time:", incremented_time)

    time1 = Time(1, 30, 15)
    time2 = Time(2, 15, 0)


    print("Time1 in seconds:", time1.time_to_int())
    print("Time2 in seconds:", time2.time_to_int())

    added_time = time1 + time2
    print("Added time:", added_time)

if __name__ == "__main__":
    main()
```