

## Exercise 1: Parking Fee

[50 marks]

### Problem Statement

Mr. Wu has been going to work every day by taxi for many years. However, the taxi fare has been increasing rather quickly in recent years. Therefore, he is considering driving to work instead.

One of the costs for driving is the parking fee. The parking rates of the car park at Mr. Wu's workplace are as shown in the table below.

	Weekday	Saturday	Sunday
4am ~ 7am	\$2.00 per hour	\$2.50 per hour	\$5.00 per entry
7am ~ 6pm	\$1.20 per 30 minutes	\$1.50 per 30 minutes	
6pm ~ midnight	\$5.00 per entry	\$7.00 per entry	

Special note:

1. The car park opens at 4am and closes at midnight. All vehicles must leave by midnight.
2. There is a grace period of 10 minutes on any day (i.e., it is completely free to park for 10 minutes or less regardless of day and time.)
3. There is a 10% surcharge for parking more than 10 hours on a weekday and 20% for Saturday. There is no surcharge for Sunday.
4. There is an additional \$3.00 fee for exiting after 10pm on any day. (Surcharge is not applicable on this fee.)

Here are a few examples on how the total fee is calculated:

Example 1: Tuesday, 4:29am to 7:50am.

- 4:29am to 7am is charged as 3 1-hour slots:  $\$2.00 * 3 = \$6.00$
- 7am to 7:50am is charged as 2 30-minute slots:  $\$1.20 * 2 = \$2.40$
- Total fee =  $\$6.00 + \$2.40 = \$8.40$

Example 2: Saturday, 7:01am to 7:49pm.

- 7:01am to 6pm is charged as 22 30-minute slots:  $\$1.50 * 22 = \$33.00$
- 6pm to 7:49pm is charged as one entry:  $\$7.00$
- 20% Surcharge for parking more than 10 hours:  $(\$33.00 + \$7.00) * 20\% = \$8.00$
- Total fee =  $\$33.00 + \$7.00 + \$8.00 = \$48.00$

Example 3: Sunday, 3pm to 10:01pm.

- 3pm to 10:01pm is charged as one entry:  $\$5.00$
- Additional fee for exiting after 10pm:  $\$3.00$
- Total fee =  $\$5.00 + \$3.00 = \$8.00$

Example 4: Thursday, 11:49pm to 11:59pm.

- Grace period
- Total fee =  $\$0.00$

Example 5: Monday, 12pm to 10:01pm.

- 12pm to 6pm is charged as 12 30-minute slots:  $\$1.20 * 12 = \$14.40$
- 6pm to 10:01pm is charged as one entry:  $\$5.00$
- 10% Surcharge for parking more than 10 hours:  $(\$14.40 + \$5.00) * 10\% = \$1.94$
- Additional fee for exiting after 10pm:  $\$3.00$
- Total fee =  $\$14.40 + \$5.00 + \$1.94 + \$3.00 = \$24.34$

In this exercise, you are to write a program to calculate the parking fee so that Mr. Wu can have a good idea of how much the parking is going to cost him.

Your program should read in one integer, which is an integer between 1 and 7 representing the day of the week (1 being Monday and 7 being Sunday). It should also read in two numbers representing the time-in and time-out in 24-hour format. It should then calculate and display the parking fee (with two decimal places).

You may assume that the inputs are valid (*i.e.*, the day is within the specified range, both time-in and time-out are between 4am and midnight in 24-hour format, and time-out is no earlier than time-in).

Write on the skeleton file **parking.c** given to you. You need to include one function:

- `double computeFee(int day, int timeIn, int timeOut)`  
which takes in day (an integer between 1 and 7), time-in (in 24-hour format) and time-out (in 24-hour format), and returns parking fee accordingly.

You may define additional functions as needed. Check sample runs for input and output format.

## Sample Runs

Five sample runs are shown below with user input highlighted in **bold**.

```
Enter day: 2  
Enter time-in: 429  
Enter time-out: 750  
Parking fee is $8.40.
```

```
Enter day: 6  
Enter time-in: 701  
Enter time-out: 1949  
Parking fee is $48.00.
```

```
Enter day: 7  
Enter time-in: 1500  
Enter time-out: 2201  
Parking fee is $8.00.
```

```
Enter day: 4  
Enter time-in: 2349  
Enter time-out: 2359  
Parking fee is $0.00.
```

```
Enter day: 1  
Enter time-in: 1200  
Enter time-out: 2201  
Parking fee is $24.34.
```