

Lab 1

QA1

```
qA1.cpp
4 // Student details program
5 int main()
6 {
7     string name, gender, address;
8     int age;
9     double amount;
10
11     // Input
12     cout << "Student Name      : ";
13     cin >> name;
14
15     cout << "Student Gender    : ";
16     cin >> gender;
17
18     cout << "Student Age      : ";
19     cin >> age;
20
21     cout << "Student Home Address : ";
22     cin >> address;
```

PS C:\Users\qianc\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1> cd "C:\Users\qianc\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output" & .\qA1.exe

Student Name : John
Student Gender : M
Student Age : 20
Student Home Address : Selangor
E-wallet Amount (RM) : 10

Student details as below:

Name	Age	Gender	Address	E-wallet (RM)
John	20	M	Selangor	RM10.00

PS C:\Users\qianc\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output>

QA2

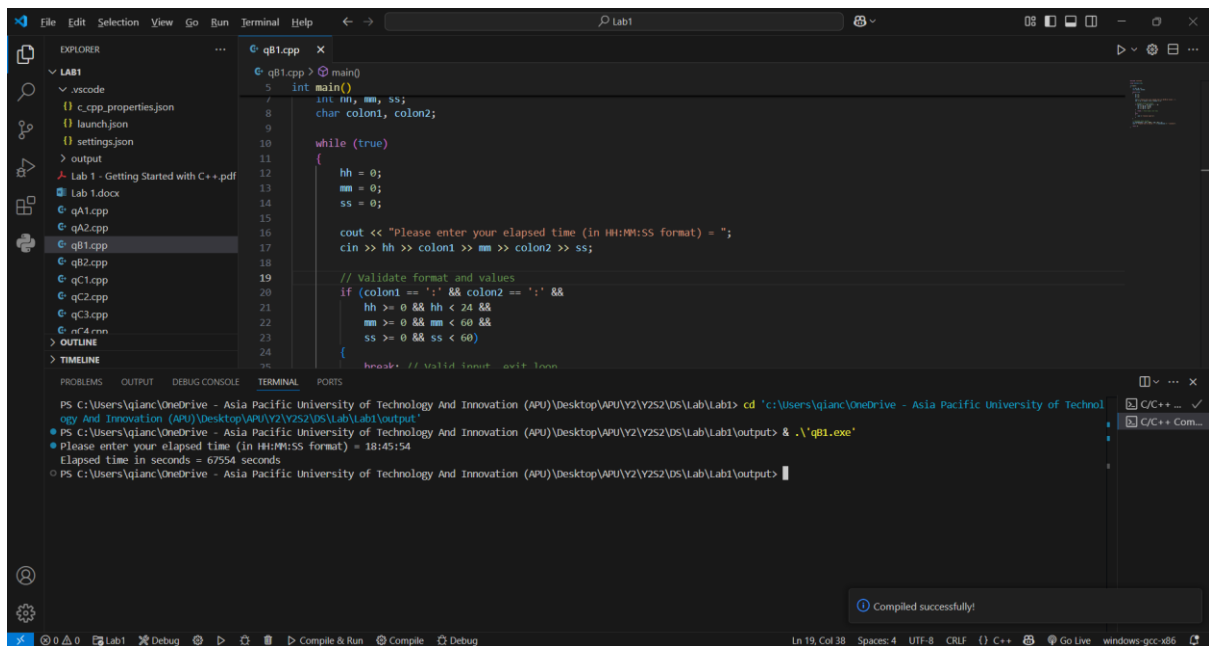
```
qA2.cpp
6 int main()
7 {
8     // Student details program
9
10     cout << "Student Gender    : ";
11     cin >> gender;
12
13     cout << "Student Age      : ";
14     cin >> age;
15
16     cout << "Student Home Address : ";
17     cin >> address;
18
19     cout << "E-wallet Amount (RM) : ";
20     cin >> amount;
21
22     cout << "Press any key to continue...";
23     _getch();
24     system("cls");
25 }
```

Student Details as below:

Name	Age	Gender	Address	E-wallet
Alice	19	F	Kuala	RM 0.00

PS C:\Users\qianc\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output>

QB1

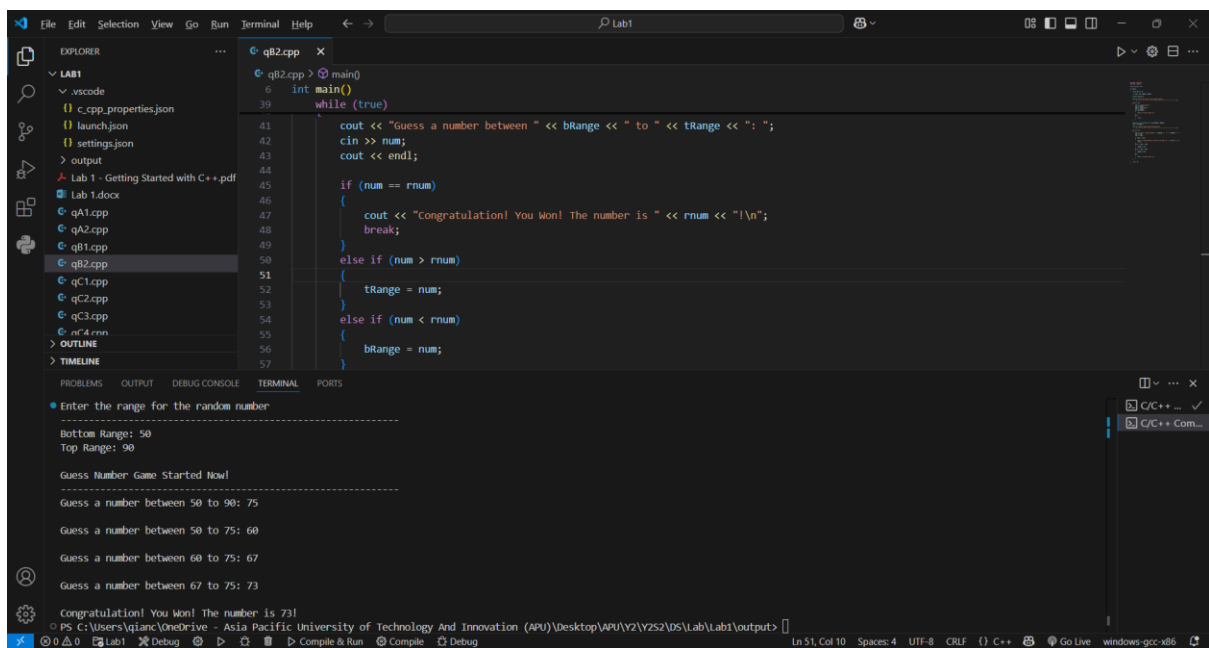


The screenshot shows the Visual Studio Code interface with the file explorer on the left displaying a project named 'LAB1'. The file 'qb1.cpp' is selected. The code in the editor is as follows:

```
1 int main()
2 {
3     int hh, mm, ss;
4     char colon1, colon2;
5
6     while (true)
7     {
8         hh = 0;
9         mm = 0;
10        ss = 0;
11
12        cout << "Please enter your elapsed time (in HH:MM:SS format) = ";
13        cin >> hh >> colon1 >> mm >> colon2 >> ss;
14
15        // Validate format and values
16        if (colon1 == ':' && colon2 == ':') &&
17            hh >= 0 && hh < 24 &&
18            mm >= 0 && mm < 60 &&
19            ss >= 0 && ss < 60)
20        {
21            break; // Valid input, exit loop
22        }
23    }
24 }
```

The terminal window at the bottom shows the execution of the program. It prompts the user to enter elapsed time, and the user enters '18:45:54'. The program outputs 'Elapsed time in seconds = 6754 seconds'. A status bar at the bottom indicates 'Compiled successfully!'.

QB2



The screenshot shows the Visual Studio Code interface with the file explorer on the left displaying a project named 'LAB1'. The file 'qb2.cpp' is selected. The code in the editor is as follows:

```
1 int main()
2 {
3     while (true)
4     {
5         cout << "Guess a number between " << bRange << " to " << tRange << ": ";
6         cin >> num;
7         cout << endl;
8
9         if (num == rnum)
10        {
11            cout << "Congratulation! You Won! The number is " << rnum << "\n";
12            break;
13        }
14        else if (num > rnum)
15        {
16            tRange = num;
17        }
18        else if (num < rnum)
19        {
20            bRange = num;
21        }
22    }
23 }
```

The terminal window at the bottom shows the execution of the program. It prompts the user to enter a range for the random number, and the user enters '50' for the bottom range and '90' for the top range. The program then prompts the user to guess a number between 50 and 90. The user enters '73', and the program outputs 'Congratulation! You Won! The number is 73!'. A status bar at the bottom indicates 'Compiled successfully!'.

QC1

The screenshot shows the Visual Studio Code interface with the file explorer on the left, the source code editor in the center, and the terminal at the bottom. The source code is a C++ program named `qC1.cpp` that takes a year and a month as input and displays a calendar grid. The terminal shows the program being run with the input year 2024 and month 2, resulting in a calendar for February 2024.

```

qC1.cpp
22 int main() {
23     int year, month;
24     cout << "Enter year: ";
25     cin >> year;
26     cout << "Enter month (1-12): ";
27     cin >> month;
28     // Validate month
29     if (month < 1 || month > 12) {
30         cout << "Invalid month. Please enter a month between 1 and 12.\n";
31         return 1;
32     }
33     // Determine the day of the week for the first day of the month
34     int day = 1;
35     for (int i = 0; i < startDay; i++) {
36         cout << "    ";
37     }
38     for (int i = startDay; day <= days; i++) {
39         cout << setw(9) << day;
40         if ((i + 1) % 7 == 0) {
41             cout << endl;
42             day++;
43         }
44     }
45     cout << "\n";
46     int choice;
47     cout << "Do you want to see another month? 1 = Yes, Others = No: ";
48     cin >> choice;
49     while (choice == 1) {
50         // Repeat the process for the next month
51         month++;
52         if (month > 12) {
53             month = 1;
54             year++;
55         }
56         // Recalculate startDay and days for the new month
57         // ... (omitted code for month logic) ...
58     }
59 }

```

Terminal Output:

```

PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output> .\qC1.exe
Enter year: 2024
Enter month: 2
Calendar Title : February - 2024
Sunday Monday Tuesday Wednesday Thursday Friday Saturday
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29
Do you want to see another month? 1 = Yes, Others = No: 2

```

QC2

The screenshot shows the Visual Studio Code interface with the file explorer on the left, the source code editor in the center, and the terminal at the bottom. The source code is a C++ program named `qC2.cpp` that takes a year and a month as input, calculates the number of hot and rainy days, and displays the results. The terminal shows the program being run with the input year 2018 and month 2, resulting in the number of hot days (3) and rainy days (1) for February 2018.

```

qC2.cpp
22 int main() {
23     int year, month;
24     cout << "Enter year: ";
25     cin >> year;
26     cout << "Enter month (1-12): ";
27     cin >> month;
28     // Validate month
29     if (month < 1 || month > 12) {
30         cout << "Invalid month. Please enter a month between 1 and 12.\n";
31         return 1;
32     }
33     // Convert month number to name
34     string months[] = {"January", "February", "March", "April", "May", "June",
35                       "July", "August", "September", "October", "November", "December"};
36     monthName = months[month - 1];
37     cout << "Month: " << monthName << " has " << days << " days.\n";
38     // Loop through each day to get weather input
39     for (int i = 1; i <= days; i++) {
40         cout << "Day " << i << ": Enter 'H' for Hot, 'R' for Rainy, 'C' for Cloudy, ('E' to end): ";
41         cin >> weather;
42         // Count based on user input
43         if (weather == 'H' || weather == 'h') {
44             hotcount++;
45         } else if (weather == 'R' || weather == 'r') {
46             rainycount++;
47         }
48     }
49     cout << "Number of hot days this month: " << hotcount << endl;
50     cout << "Number of rainy days this month: " << rainycount << endl;
51 }

```

Terminal Output:

```

PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output> .\qC2.exe
Enter year: 2018
Enter month: 2
Month: February 2018 has 28 days.
Day 1 : Enter 'H' for Hot, 'R' for Rainy, 'C' for Cloudy, ('E' to end): h
Day 2 : Enter 'H' for Hot, 'R' for Rainy, 'C' for Cloudy, ('E' to end): H
Day 3 : Enter 'H' for Hot, 'R' for Rainy, 'C' for Cloudy, ('E' to end): k
Invalid input! Please enter 'H', 'R', or 'C'.
Day 3 : Enter 'H' for Hot, 'R' for Rainy, 'C' for Cloudy, ('E' to end): r
Day 4 : Enter 'H' for Hot, 'R' for Rainy, 'C' for Cloudy, ('E' to end): C
Day 5 : Enter 'H' for Hot, 'R' for Rainy, 'C' for Cloudy, ('E' to end): H
Day 6 : Enter 'H' for Hot, 'R' for Rainy, 'C' for Cloudy, ('E' to end): e
Number of hot days this month: 3
Number of rainy days this month: 1

```

QC3

```

1 #include <iostream>
2 #include <iomanip>
3 using namespace std;
4
5 int main() {
6     double exchangeRate, amount, convertedAmount;
7     int choice;
8
9     cout << "Enter the exchange rate from dollars to RMB: ";
10    cin >> exchangeRate;
11
12    cout << "Enter 0 to convert dollars to RMB and 1 vice versa: ";
13    cin >> choice;
14
15    if (choice == 0) {
16        cout << "Enter the dollar amount: ";
17        cin >> amount;
18        convertedAmount = amount * exchangeRate;
19        cout << fixed << setprecision(2);

```

Terminal Output:

```

PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1> cd 'c:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output'
Enter the exchange rate from dollars to RMB: 6.82
Enter 0 to convert dollars to RMB and 1 vice versa: 0
Enter the dollar amount: 100
$100.00 is 682.00 yuan.

```

QC4

```

1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     int n;
6
7     cout << "Enter number of rows (for diamond dimension): ";
8     cin >> n;
9
10    for (int i = 1; i <= n; i++) {
11        for (int j = 1; j <= n; j++) {
12            cout << " ";
13        }
14
15        for (int j = 1; j <= (2 * i - 1); j++) {
16            cout << "*";
17        }
18        cout << endl;
19    }

```

Terminal Output:

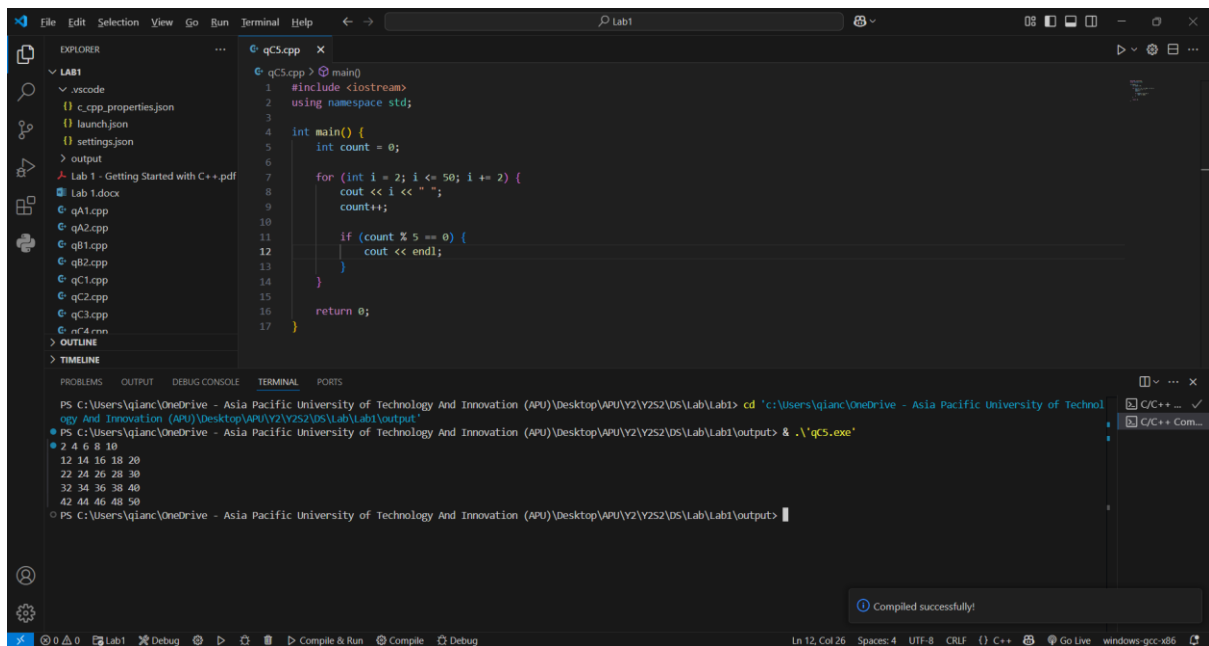
```

PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1> cd 'c:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output'
Enter number of rows (for diamond dimension): 6
*
***
*****
*****
***
*

```

Notification: Compiled successfully!

QC5



```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     int count = 0;
6
7     for (int i = 2; i <= 50; i += 2) {
8         cout << i << " ";
9         count++;
10
11         if (count % 5 == 0) {
12             cout << endl;
13         }
14     }
15
16     return 0;
17 }
```

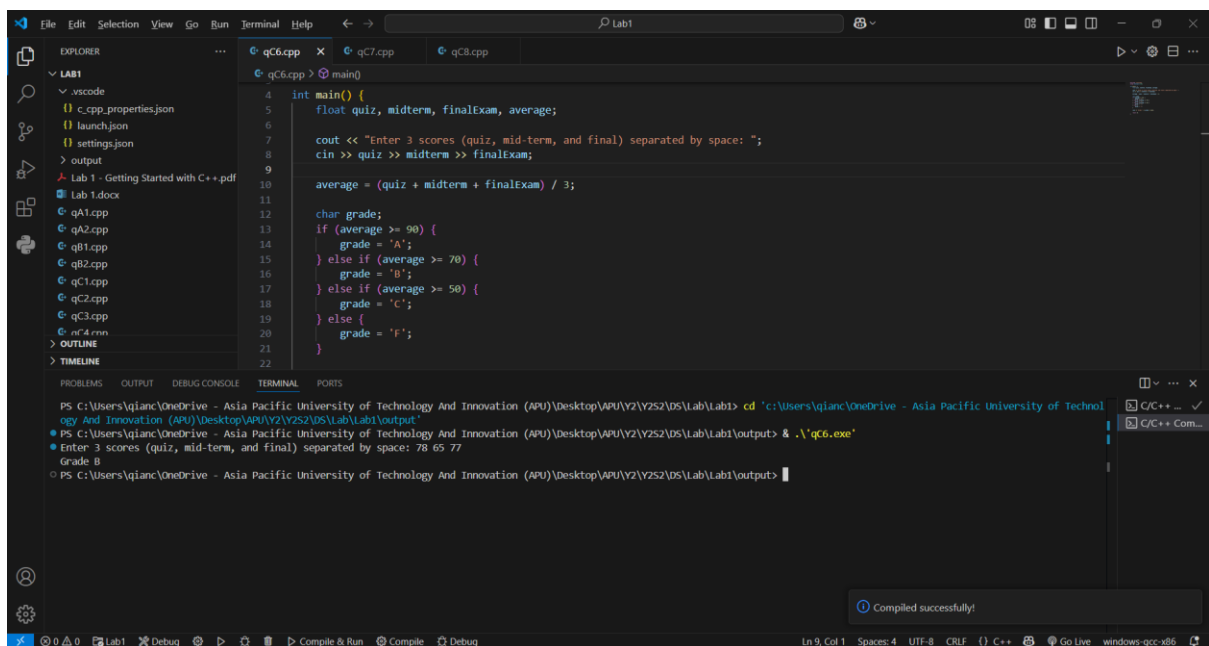
PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1> cd 'c:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output' & .\qc5.exe

2 4 6 8 10
12 14 16 18 20
22 24 26 28 30
32 34 36 38 40
42 44 46 48 50

PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output> |

Compiled successfully!

QC6



```
4 int main() {
5     float quiz, midterm, finalExam, average;
6
7     cout << "Enter 3 scores (quiz, mid-term, and final) separated by space: ";
8     cin >> quiz >> midterm >> finalExam;
9
10    average = (quiz + midterm + finalExam) / 3;
11
12    char grade;
13    if (average >= 90) {
14        grade = 'A';
15    } else if (average >= 70) {
16        grade = 'B';
17    } else if (average >= 50) {
18        grade = 'C';
19    } else {
20        grade = 'F';
21    }
22 }
```

PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1> cd 'c:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output' & .\qc6.exe

Enter 3 scores (quiz, mid-term, and final) separated by space: 78 65 77

Grade: B

PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output> |

Compiled successfully!

QC7

```

1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     double widthA, heightA, widthB, heightB;
6
7     cout << "Rectangle A:\n";
8     cout << "Width = ";
9     cin >> widthA;
10    cout << "Height = ";
11    cin >> heightA;
12    cout << endl;
13
14    cout << "Rectangle B:\n";
15    cout << "Width = ";
16    cin >> widthB;
17    cout << "Height = ";
18    cin >> heightB;
19    cout << endl;
20
21    double areaA = widthA * heightA;
22    double areaB = widthB * heightB;
23
24    if (areaA > areaB) {
25        cout << "Area in rectangle A is bigger than rectangle B.\n";
26    } else if (areaB > areaA) {
27        cout << "Area in rectangle B is bigger than rectangle A.\n";
28    } else {
29        cout << "Both rectangles have the same area.\n";
30    }
31}

```

Terminal Output:

```

PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1> cd 'c:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output'
PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output> g++ qC7.cpp & .\qC7.exe
Rectangle A:
Width = 3
Height = 5

Rectangle B:
Width = 6
Height = 4

Area in rectangle B is bigger than rectangle A.
PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output>

```

Compiled successfully!

QC8

```

1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     const double GST = 0.06;
6
7     double mealCost, tipPercent;
8
9     cout << "Enter the cost of the meal (before GST and tipping): ";
10    cin >> mealCost;
11    cout << "Enter the tip percentage you want to give (e.g., 6 for 6%): ";
12    cin >> tipPercent;
13
14    double afterGST = mealCost * (1 + GST);
15    double afterTip = afterGST * (1 + tipPercent/100);
16
17    cout << "\nCost breakdown:\n";
18    cout << "Before GST and tipping: " << mealCost << endl;
19    cout << "After GST (6%): " << afterGST << endl;
20    cout << "After GST and tipping (7%): " << afterTip << endl;
21}

```

Terminal Output:

```

PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1> cd 'c:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output'
PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output> g++ qC8.cpp & .\qC8.exe
Enter the cost of the meal (before GST and tipping): 15
Enter the tip percentage you want to give (e.g., 6 for 6%): 7

Cost breakdown:
Before GST and tipping: 15
After GST (6%): 15.9
After GST and tipping (7%): 17.013
PS C:\Users\qiang\OneDrive - Asia Pacific University of Technology And Innovation (APU)\Desktop\APU\Y2\Y2S2\DS\Lab\Lab1\output>

```