

This screenshot shows the Visual Studio Code interface with a C++ program open in the editor. The Explorer panel on the left shows the file structure of the workspace, including a folder named 'c++ program' containing files like 'first.cpp', 'first.exe', 'firstprogram.cpp', 'firstprogram.exe', 'second.cpp', and 'second.exe'. The main editor window displays the code for 'second.cpp', which is a program to print all natural numbers from 1 to 20. The code includes the necessary headers and uses the `std::cout` and `std::endl` for output. The terminal at the bottom shows the command to run the program, which successfully outputs the sequence of numbers from 1 to 20.

```
1 // 1)WAP for printing all natural numbers till 20.
2 #include <iostream>
3 using namespace std;
4
5 int main()
6 {
7     for (int i = 1; i <= 20; ++i) {
8         cout << i << " ";
9     }
10
11     cout << endl;
12
13     return 0;
14 }
15
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\" ; i  
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20  
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program>

This screenshot shows the Visual Studio Code interface with a C++ program open in the editor. The Explorer panel on the left shows the file structure of the workspace, including a folder named 'c++ program' containing files like 'first.cpp', 'first.exe', 'firstprogram.cpp', 'firstprogram.exe', 'second.cpp', and 'second.exe'. The main editor window displays the code for 'second.cpp', which is a program to print all natural numbers from 20 down to 1 in reverse order. The code includes the necessary headers and uses the `std::cout` and `std::endl` for output. The terminal at the bottom shows the command to run the program, which successfully outputs the sequence of numbers from 20 down to 1.

```
18 // 2)WAP for printing all natural numbers in reverse order
19 #include <iostream>
20 using namespace std;
21
22 int main()
23 {
24     for (int i = 20; i >= 1; --i)
25     {
26         cout << i << " ";
27     }
28
29     cout << endl;
30
31     return 0;
32 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\"  
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1  
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program>

The screenshot shows the Visual Studio Code interface with a workspace named "Untitled (Workspace)". The Explorer panel on the left shows a file structure for a C++ program, including files like first.cpp, first.exe, firstprogram.cpp, firstprogram.exe, second.cpp, and second.exe. The main editor window displays the code for second.cpp, which is a C++ program for printing all even numbers from 1 to 20. The code is as follows:

```
35 // 3)WAP for printing all even numbers from 1 to 20.
36 #include <iostream>
37 using namespace std;
38
39 int main() {
40     for (int i = 2; i <= 20; i += 2)
41     {
42         cout << i << " ";
43     }
44
45     cout << endl;
46
47     return 0;
48 }
```

The Terminal panel at the bottom shows the command prompt output for the program:

```
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\"
2 4 6 8 10 12 14 16 18 20
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program>
```

The screenshot shows the Visual Studio Code interface with a workspace named "Untitled (Workspace)". The Explorer panel on the left shows a file structure for a C++ program, including files like first.cpp, first.exe, firstprogram.cpp, firstprogram.exe, second.cpp, and second.exe. The main editor window displays the code for second.cpp, which is a C++ program for printing all odd numbers from 1 to 20. The code is as follows:

```
51 // 4)WAP for printing all odd numbers from 1 to 20.
52 #include <iostream>
53 using namespace std;
54
55 int main()
56 {
57     for (int i = 1; i <= 20; i += 2)
58     {
59         cout << i << " ";
60     }
61
62     cout << endl;
63
64     return 0;
65 }
```

The Terminal panel at the bottom shows the command prompt output for the program:

```
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\"
1 3 5 7 9 11 13 15 17 19
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program>
```

```
File Edit Selection View Go Run Terminal Help
EXPLORER
UNTITLED (WORKSPACE)
  c++ program
    .vscode
      tasks.json
    first.cpp
    first.exe
    firstprogram.cpp
    firstprogram.exe
    second.cpp
    second.exe
second.cpp
c++ program > second.cpp > ...
68 // 5)WAP for adding all numbers from 1 to 20.
69 #include <iostream>
70 using namespace std;
71
72 int main() {
73     int sum = 0;
74
75     for (int i = 1; i <= 20; ++i) {
76         sum += i;
77     }
78
79     cout << "The sum of numbers from 1 to 20 is: " << sum << endl;
80
81     return 0;
82 }
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\" ; if ($?) { g++ second.cpp -o first.exe
The sum of numbers from 1 to 20 is: 210
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program>
```

```
File Edit Selection View Go Run Terminal Help
EXPLORER
UNTITLED (WORKSPACE)
  c++ program
    .vscode
      tasks.json
    first.cpp
    first.exe
    firstprogram.cpp
    firstprogram.exe
    second.cpp
    second.exe
second.cpp
c++ program > second.cpp > main()
85 // 6)WAP for finding sum of all even numbers till 20.
86 #include <iostream>
87 using namespace std;
88
89 int main() {
90     int sum = 0;
91
92     for (int i = 2; i <= 20; i += 2) {
93         sum += i;
94     }
95
96     cout << "The sum of even numbers from 1 to 20 is: " << sum << endl;
97
98     return 0;
99 }
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\" ; if ($?) { g++ second.cpp -o first.exe
The sum of even numbers from 1 to 20 is: 110
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program>
```

The screenshot shows the Visual Studio Code interface with a C++ program open in the editor. The Explorer panel on the left shows the file structure of the workspace. The main editor window displays the code for `second.cpp`, which calculates the sum of odd numbers from 1 to 20. The terminal at the bottom shows the command to compile and run the program, and the output of the program.

```
File Edit Selection View Go Run Terminal Help
c++ program > second.cpp x
102 // 7)WAP for finding sum of all odd numbers till 20.
103 #include <iostream>
104 using namespace std;
105
106 int main() {
107     int sum = 0;
108
109     for (int i = 1; i <= 20; i += 2) {
110         sum += i;
111     }
112
113     cout << "The sum of odd numbers from 1 to 20 is: " << sum << endl;
114
115     return 0;
116 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\"; if (\$?) { g++ second.cpp -o second.exe }
The sum of odd numbers from 1 to 20 is: 100
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program>

The screenshot shows the Visual Studio Code interface with a C++ program open in the editor. The Explorer panel on the left shows the file structure of the workspace. The main editor window displays the code for `second.cpp`, which prints a multiplication table for a given number. The terminal at the bottom shows the command to compile and run the program, and the output of the program, which displays a multiplication table for the number 2.

```
File Edit Selection View Go Run Terminal Help
c++ program > second.cpp x
119 // 8)WAP for printing multiplication table of a number. For eg. Display should be " 2 X 1 = 2"
120 #include <iostream>
121 using namespace std;
122
123 int main() {
124     int number;
125
126     cout << "Enter a number: ";
127     cin >> number;
128
129     cout << "Multiplication Table for " << number << ":" << endl;
130
131     for (int i = 1; i <= 10; ++i) {
132         cout << number << " x " << i << " = " << (number * i) << endl;
133     }
134     return 0;
135 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

Enter a number: 2
Multiplication Table for 2:
2 x 1 = 2
2 x 2 = 4
2 x 3 = 6
2 x 4 = 8
2 x 5 = 10
2 x 6 = 12
2 x 7 = 14
2 x 8 = 16
2 x 9 = 18
2 x 10 = 20
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program>

The screenshot shows the Visual Studio Code interface with a C++ program open in the editor. The program is titled "second.cpp" and is located in a workspace named "Untitled (Workspace)". The code is as follows:

```
138 // 9)WAP to calculate factorial of a number.
139 #include <iostream>
140 using namespace std;
141
142 int main() {
143     int number;
144     long factorial = 1.0;
145
146     cout << "Enter a positive integer: ";
147     cin >> number;
148
149     if (number < 0)
150         cout << "Factorial is not defined for negative numbers." << endl;
151     else {
152
153         for (int i = 1; i <= number; ++i) {
154             factorial *= i;
155         }
156
157         cout << "The factorial of " << number << " is: " << factorial << endl;
158     }
159
160     return 0;
161 }
```

The terminal output shows the program being executed from the command prompt:

```
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\"
Enter a positive integer: 4
The factorial of 4 is: 24
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program>
```

The screenshot shows the Visual Studio Code interface with a C++ program open in the editor. The program is titled "second.cpp" and is located in a workspace named "Untitled (Workspace)". The code is as follows:

```
164 // 10)WAP to check whether a number is prime or not.
165 #include <iostream>
166 #include <cmath>
167 using namespace std;
168 int main() {
169     int number;
170     bool isPrime = true;
171
172     cout << "Enter a positive integer: ";
173     cin >> number;
174
175     if (number < 2) {
176         isPrime = false;
177     } else {
178
179         for (int i = 2; i <= sqrt(number); ++i) {
180
181             if (number % i == 0) {
182                 isPrime = false;
183                 break;
184             }
185         }
186
187     }
188
189     if (isPrime) {
190         cout << number << " is a prime number." << endl;
191     } else {
192         cout << number << " is not a prime number." << endl;
193     }
194
195     return 0;
196 }
197 }
```

```
terminal Help  ← →  Untitled (Workspace)

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\" ; if ($?) { g++ second.cpp -o second } ; if ($?) { .\second }
Enter a positive integer: 9
9 is not a prime number.
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\" ; if ($?) { g++ second.cpp -o second } ; if ($?) { .\second }
Enter a positive integer: 2
2 is a prime number.
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> |
```

```
File Edit Selection View Go Run Terminal Help  ← →  Untitled (Workspace)

RUN AND DEBUG  ...  first.cpp  second.cpp  Settings

> RUN
BREAKPOINTS
  All C++ Exceptions

200 // 11)WAP to print all digits of a number and their sum.
201 #include <iostream>
202 using namespace std;
203
204 int main() {
205     long long num;
206     cout << "Enter a number: ";
207     cin >> num;
208
209     if (num < 0) {
210         num = -num;
211     }
212
213     long long originalNum = num;
214     int digit;
215     int sum = 0;
216
217     cout << "Digits of the number " << originalNum << " are: ";
218
219     while (num > 0) {
220         digit = num % 10;
221         cout << digit << " ";
222         sum += digit;
223         num /= 10;
224     }
225     cout << "\nSum of the digits: " << sum << endl;
226     return 0;
227 }
228
```

```
File Edit Selection View Go Run Terminal Help  ← →  Untitled (Workspace)

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\" ; if ($?) { g++ second.cpp -o second } ; if ($?) { .\second }
Enter a number: 5
Digits of the number 5 are: 5
Sum of the digits: 5
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\" ; if ($?) { g++ second.cpp -o second } ; if ($?) { .\second }
Enter a number: 35
Digits of the number 35 are: 5 3
Sum of the digits: 8
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> |
```

The screenshot shows the Visual Studio Code interface with a C++ program open in the editor. The program is designed to reverse a number. The code is as follows:

```
230 // 12)WAP to print reverse of a number.
231 #include <iostream>
232 using namespace std;
233
234 int main() {
235     int num, reversedNum = 0;
236
237     cout << "Enter a number: ";
238     cin >> num;
239
240     while (num != 0) {
241         int digit = num % 10;
242         reversedNum = reversedNum * 10 + digit;
243         num /= 10;
244     }
245
246     cout << "Reversed number: " << reversedNum << endl;
247
248     return 0;
249 }
```

The terminal output shows the program being executed with the input 5478, resulting in the reversed number 8745.

```
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\"
Enter a number: 5478
Reversed number: 8745
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program>
```

The screenshot shows the Visual Studio Code interface with a C++ program open in the editor. The program is designed to check if a number is an Armstrong number. The code is as follows:

```
252 // 13)WAP to check whether the number is Armstrong or not.
253 #include <iostream>
254 #include <cmath>
255 using namespace std;
256
257 int countDigits(int num) {
258     int count = 0;
259     while (num != 0) {
260         num /= 10;
261         count++;
262     }
263     return count;
264 }
265
266 bool isArmstrong(int num) {
267     int originalNum = num;
268     int sum = 0;
269     int n = countDigits(num);
270
271     while (num != 0) {
272         int digit = num % 10;
273         sum += pow(digit, n);
274         num /= 10;
275     }
276     return sum == originalNum;
277 }
278
279 int main() {
280     int num;
281
282     cout << "Enter a number: ";
283     cin >> num;
284
285     if (isArmstrong(num)) {
286         cout << num << " is an Armstrong number." << endl;
287     } else {
288         cout << num << " is not an Armstrong number." << endl;
289     }
290     return 0;
291 }
```

The screenshot shows the Visual Studio Code interface with the terminal pane active. The terminal displays the execution of a C++ program that checks if a number is an Armstrong number. The program prompts the user to enter a number and then checks if the sum of the cubes of its digits equals the number itself. The output shows that 110 is not an Armstrong number, 153 is not an Armstrong number, and 1 is an Armstrong number.

```
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\" ; if ($?) { g++ second.cpp -o second } ; if ($?) { .\second }
Enter a number: 110
110 is not an Armstrong number.
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\" ; if ($?) { g++ second.cpp -o second } ; if ($?) { .\second }
Enter a number: 153
153 is not an Armstrong number.
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\" ; if ($?) { g++ second.cpp -o second } ; if ($?) { .\second }
Enter a number: 1
1 is an Armstrong number.
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program>
```

The screenshot shows the Visual Studio Code interface with the source code of a C++ program open. The program is designed to print the Fibonacci series up to a given range. The code includes the necessary headers, uses the std namespace, and defines a main function that prompts the user for a range and then prints the Fibonacci series up to that range. The terminal pane at the bottom shows the execution of the program, which prompts the user to enter a range and then prints the Fibonacci series up to 5 terms: 0 1 1 2 3.

```
294 // // 14)WAP to print the Fibonacci series in a given range.
295 #include <iostream>
296 using namespace std;
297
298 int main() {
299     int range, first = 0, second = 1, next;
300
301     cout << "Enter the range for the Fibonacci series: ";
302     cin >> range;
303
304     cout << "Fibonacci series up to " << range << " terms: ";
305
306     for (int i = 0; i < range; ++i) {
307         if (i <= 1) {
308             next = i;
309         } else {
310             next = first + second;
311             first = second;
312             second = next;
313         }
314         cout << next << " ";
315     }
316     cout << endl;
317     return 0;
318 }
```

```
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program> cd "c:\Users\DAVINDER SHARMA\Desktop\c++ program\" ;
Enter the range for the Fibonacci series: 5
Fibonacci series up to 5 terms: 0 1 1 2 3
PS C:\Users\DAVINDER SHARMA\Desktop\c++ program>
```



