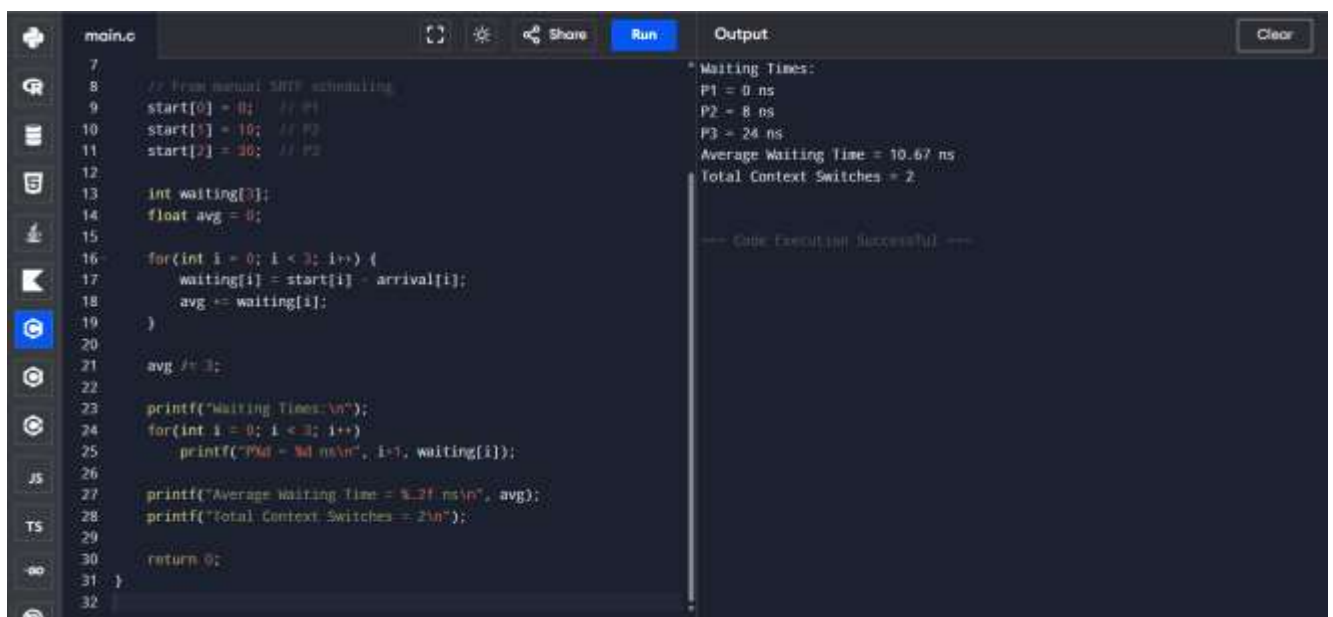


Practical 5

In an operating system three CPU-intensive processes are ready for execution, which require 10ns, 20ns and 30ns and arrival at times 0ns, 2ns and 6ns, respectively. Write a program to calculate the total number of context switches needed if the operating system implements a shortest job first (preemptive) scheduling algorithm. Also calculate the average time for which the processes have to wait before getting the CPU.

Programme & Output:



The image shows a code editor with a C program and its output. The program calculates the total number of context switches and the average waiting time for three processes using a shortest job first (preemptive) scheduling algorithm.

```
main.c
7
8 // From manual SJFS scheduling
9 start[0] = 0; // P1
10 start[1] = 10; // P2
11 start[2] = 30; // P3
12
13 int waiting[3];
14 float avg = 0;
15
16 for(int i = 0; i < 3; i++) {
17     waiting[i] = start[i] - arrival[i];
18     avg += waiting[i];
19 }
20
21 avg /= 3;
22
23 printf("Waiting Times:\n");
24 for(int i = 0; i < 3; i++)
25     printf("P%d = %d ns\n", i+1, waiting[i]);
26
27 printf("Average Waiting Time = %.2f ns\n", avg);
28 printf("Total Context Switches = 2\n");
29
30 return 0;
31 }
32
```

Output:

```
Waiting Times:
P1 = 0 ns
P2 = 8 ns
P3 = 24 ns
Average Waiting Time = 10.67 ns
Total Context Switches = 2

--- Code Execution Successful ---
```