AP-10

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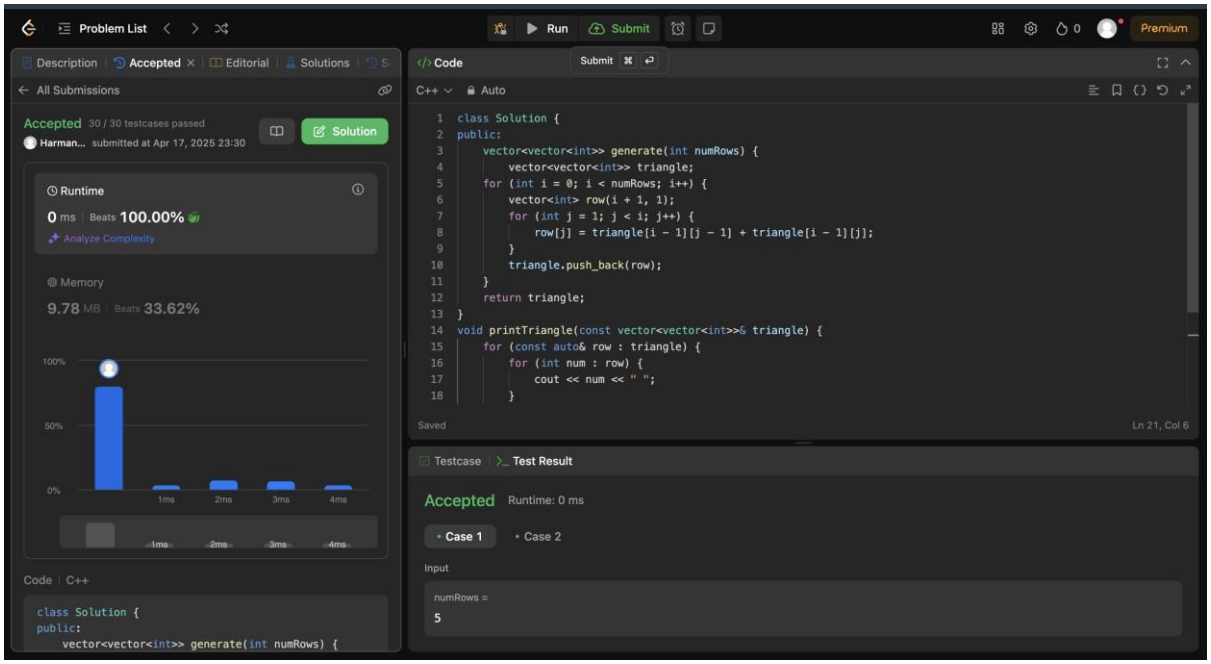
UID:22BCS10078

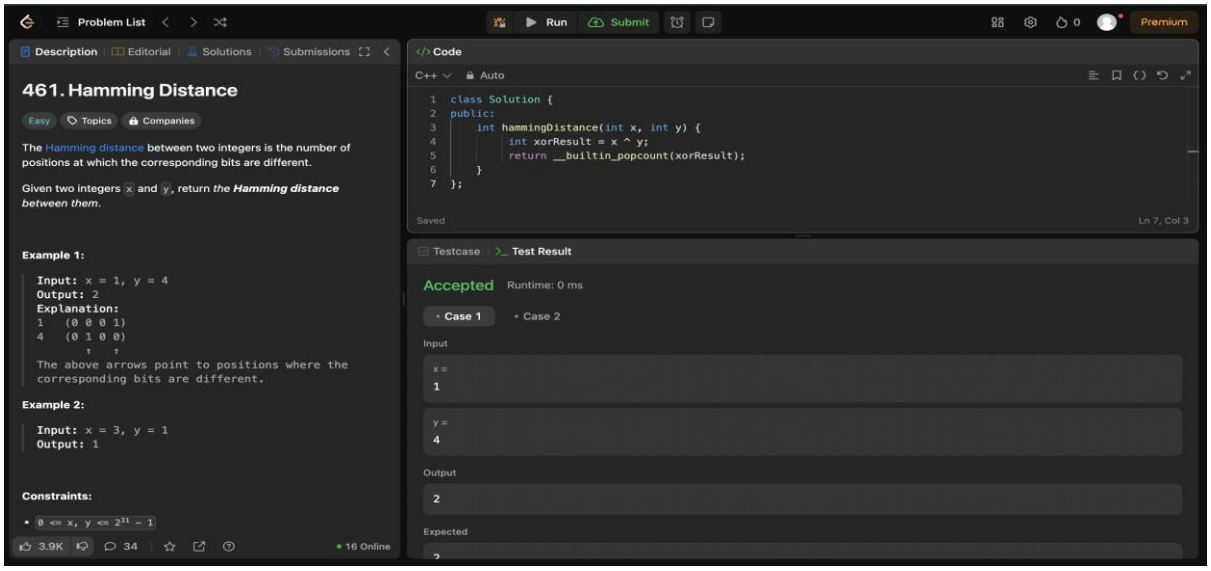
1.Pascal's Triangle

```
class Solution {
public:
vector<vector<int>> generate(int numRows) {
vector<vector<int>> triangle; for (int i = 0; i <
numRows; i++) { vector<int> row(i + 1, 1);
for (int j = 1; j < i; j++) {
row[j] = triangle[i - 1][j - 1] + triangle[i - 1][j];
}
triangle.push_back(row);
} return
triangle;
}
void printTriangle(const vector<vector<int>>& triangle) {
for (const auto& row : triangle) { for (int num : row) {
cout << num << " ";
}
cout << endl;
}
}
};
```



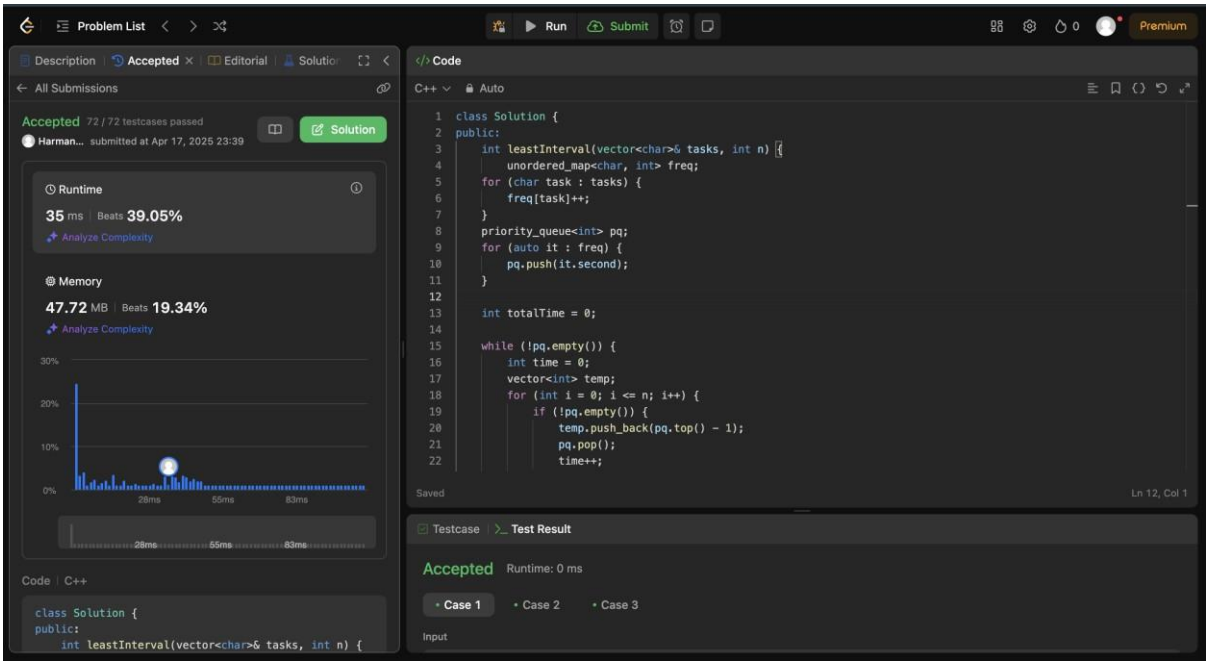
2.Hamming Distance

```
class Solution { public: int
hammingDistance(int x, int y) {
int xorResult = x ^ y;
return __builtin_popcount(xorResult);
}
};
```



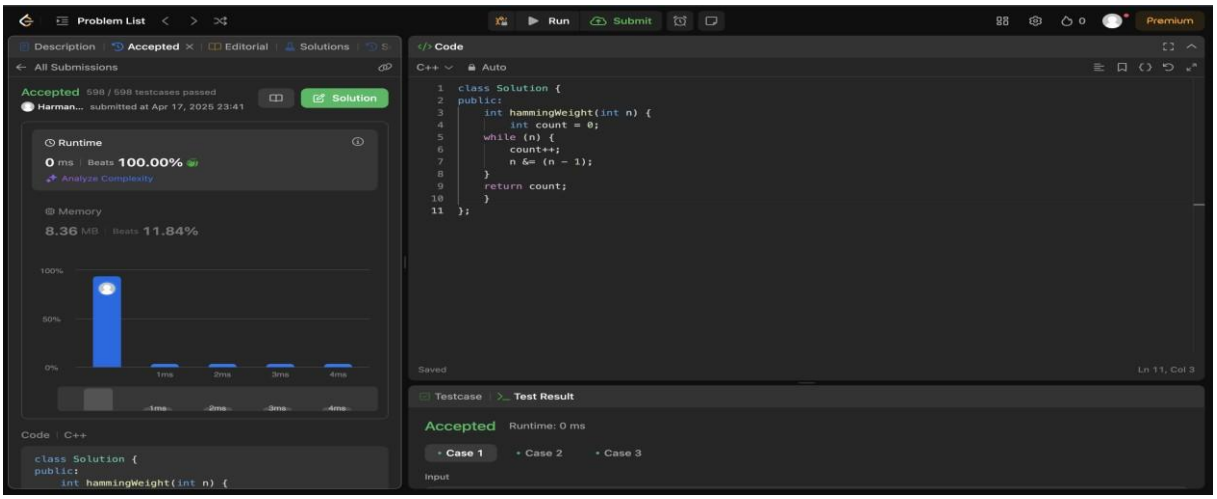
3.Task Schedular

```
class Solution { public: int
leastInterval(vector<char>& tasks, int n) {
unordered_map<char, int> freq; for (char
task : tasks) { freq[task]++;
}
priority_queue<int> pq; for
(auto it : freq) {
pq.push(it.second);
}

int totalTime = 0;

while (!pq.empty()) {
int      time      =      0;
vector<int> temp;
for (int i = 0; i <= n; i++) { if
(!pq.empty()) {
temp.push_back(pq.top() - 1);
pq.pop();
time++;
}
}

for (int count : temp) { if
(count > 0) pq.push(count);
}

totalTime += pq.empty() ? time : (n + 1);
}

return totalTime;
}
};
```



4.Number of 1‘s bits

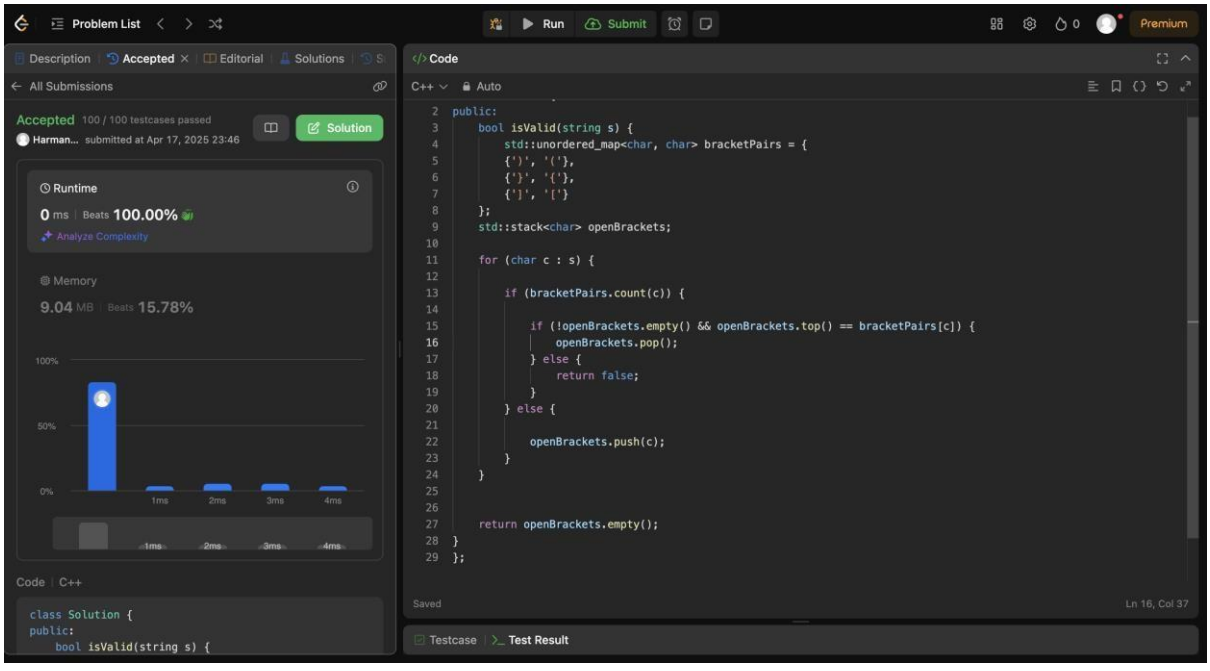
```
class Solution {
public:
int hammingWeight(int n) {
int count = 0; while (n) {
count++; n &= (n - 1);
}
return count;
}
};
```



5.Valid Parenthesis

```
public:
```

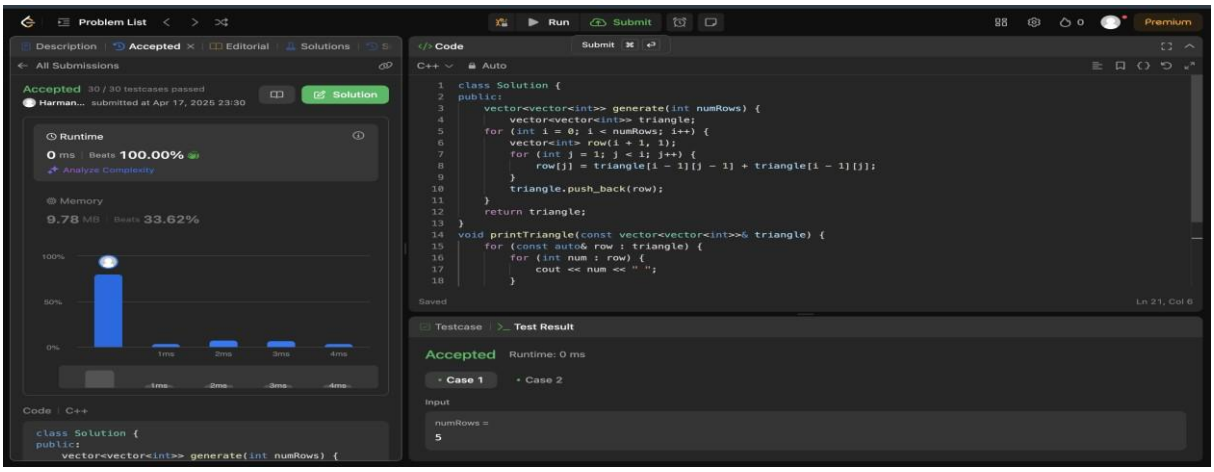
```
bool isValid(string s) { std::unordered_map<char,
char> bracketPairs = {
{')', '('},
{'}', '{'},
{']', '['}
};
std::stack<char> openBrackets;

for (char c : s) { if (bracketPairs.count(c)) { if (!openBrackets.empty()
&& openBrackets.top() == bracketPairs[c]) { openBrackets.pop();
} else { return
false;
}
} else {
openBrackets.push(c);
}
}

return openBrackets.empty();
}
};
```



6.Divide Two Integer

```
class Solution {
```

```
public: int divide(int dividend, int
divisor) { if (dividend == INT_MIN &&
divisor == -1) return INT_MAX;

long long a = abs((long long)dividend);
long long b = abs((long long)divisor); int
result = 0;

while (a >= b) {
long long temp = b, multiple = 1;

while (a >= (temp << 1)) { temp
<<= 1;
multiple <<= 1;
}

a -= temp;
result += multiple;
}

if ((dividend > 0) ^ (divisor > 0)) result
= -result;

return result;
}
};
```



7.Trapping Rain Water

```
class Solution { public: int
trap(vector<int>& height) { int
left = 0, right = height.size() - 1;
```

```
int leftMax = 0, rightMax = 0;
int waterTrapped = 0;

while (left < right) { if
(height[left] < height[right]) {
if (height[left] >= leftMax)
leftMax = height[left]; else
waterTrapped += leftMax - height[left];
left++; } else { if (height[right] >=
rightMax) rightMax = height[right];
else
waterTrapped += rightMax - height[right]; right--;
}
}

return waterTrapped;
}
};
```