
1- Trace the following program and predict the output.

```cpp
// www.gammal.tech

#include <iostream>
#include <sstream>
using namespace std;

int main() {
    string input = "10 20 30 40 50";
    stringstream ss(input);

    int sum = 0, num;

    while (ss >> num) {
        sum += num;
    }

    cout << "Sum of integers: " << sum;

    return 0;
}
```

Solution

```
Sum of integers: 150
```

2- Trace the following program and predict the output.

```cpp
// www.gammal.tech

#include <iostream>
#include <sstream>
using namespace std;

int main() {
    string sentence = "C++ is fun and versatile";
    stringstream ss(sentence);

    string word;

    while (ss >> word) {
        cout << "Word: " << word << endl;
    }

    return 0;
}
```

Solution

```
Word: C++
Word: is
Word: fun
Word: and
Word: versatile
```

3- Trace the following program and predict the output.

```cpp
// www.gammal.tech

#include <iostream>
#include <sstream>
using namespace std;

int main() {
    string input = "Hello, World!";
    stringstream ss(input);

    char ch;
    int count = 0;

    while (ss >> ch) {
        count++;
    }

    cout << "Num: " << count;

    return 0;
}
```

Solution

```
Num: 12
```

4- Trace the following program and predict the output.

```cpp
// www.gammal.tech

#include <iostream>
#include <sstream>
#include <algorithm>
using namespace std;

int main() {
    string input = "abcdefg";
    stringstream ss(input);

    string reversed;

    while (ss >> input) {
        reverse(input.begin(), input.end());
        reversed += input + " ";
    }

    cout << "Reversed string: " << reversed;

    return 0;
}
```

Solution

```
Reversed string: gfedcba
```

5- Trace the following program and predict the output.

```cpp
// www.gammal.tech

#include <iostream>
#include <sstream>
using namespace std;

int main() {
    string input = "apple,banana,orange,grape";
    stringstream ss(input);

    string token;

    while (getline(ss, token, ',')) {
        cout << "Token: " << token << endl;
    }

    return 0;
}
```

Solution

```
Token: apple
Token: banana
Token: orange
Token: grape
```

6- Trace the following program and predict the output.

```cpp
// www.gammal.tech

#include <iostream>
#include <sstream>
using namespace std;

int main() {
    string input = "3 5 7 9";
    stringstream ss(input);

    int num;

    while (ss >> num) {
        cout << "Doubled: " << num * 2 << endl;
    }

    return 0;
}
```

Solution

```
Doubled: 6
Doubled: 10
Doubled: 14
Doubled: 18
```

7- Trace the following program and predict the output.

```cpp
// www.gammal.tech

#include <iostream>
#include <sstream>
using namespace std;

int main() {
    string input = "2 4 6 8";
    stringstream ss(input);

    int num;

    while (ss >> num) {
        cout << "num: " << num * 3 << endl;
    }

    return 0;
}
```

Solution

```
num: 6
num: 12
num: 18
num: 24
```

8- Trace the following program and predict the output.

```cpp
// www.gammal.tech

#include <iostream>
#include <sstream>
using namespace std;

int main() {
    string input = "1 2 3 4 5";
    stringstream ss(input);

    int num;

    while (ss >> num) {
        if (num % 2 != 0) {
            cout << "num: " << num << endl;
        }
    }

    return 0;
}
```

Solution

```
num: 1
num: 3
num: 5
```

9- Trace the following program and predict the output.

```cpp
// www.gammal.tech

#include <iostream>
#include <sstream>
using namespace std;

int main() {
    string input = "3.14 2.5 1.2";
    stringstream ss(input);

    double sum = 0, num;

    while (ss >> num) {
        sum += num;
    }

    cout << "Sum of floating-point numbers: " << sum;

    return 0;
}
```

Solution

```
Sum of floating-point numbers: 6.84
```

10- Trace the following program and predict the output.

```cpp
// www.gammal.tech

#include <iostream>
#include <sstream>
#include <cctype>
using namespace std;

int main() {
    string input = "programming is fun";
    stringstream ss(input);

    char ch;
    int vowelCount = 0;

    while (ss >> ch) {
        char lowercaseCh = tolower(ch);
        if (lowercaseCh == 'a' || lowercaseCh == 'e' || lowercaseCh == 'i' || lowercaseCh == 'o' ||
lowercaseCh == 'u') {
            vowelCount++;
        }
    }

    cout << "Number of vowels: " << vowelCount;

    return 0;
}
```

Solution

```
Number of vowels: 5
```