

# 9. Common Debugging Tips

## 9.1 Compilation Errors

1. **Missing semicolons:** Add `;` at the end of statements
2. **Undeclared variables:** Declare variables before using them
3. **Type mismatches:** Ensure compatible types in assignments (*this mostly happens in function parameters or calling, we will learn more about this on the next module*)
4. **Missing headers:** Include necessary header files

## 9.2 Runtime Errors

1. **Segmentation faults:** Check array bounds and pointer usage.
  - *this error is the hardest part when it comes to debugging because its highly related to a wrong memory allocation or pointer usage such as accessing an unaccessible variable or array index. We will learn more about this in the next module*
2. **Infinite loops:** Verify loop conditions and increment/decrement
3. **Wrong output:** Check format specifiers in printf/scanf

## 9.3 Debugging Techniques

```
// Add debug prints to trace program execution
printf("Debug: x = %d, y = %d\n", x, y);

// Check intermediate results
int temp = a + b;
printf("Intermediate result: %d\n", temp);
int result = temp * c;
```

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