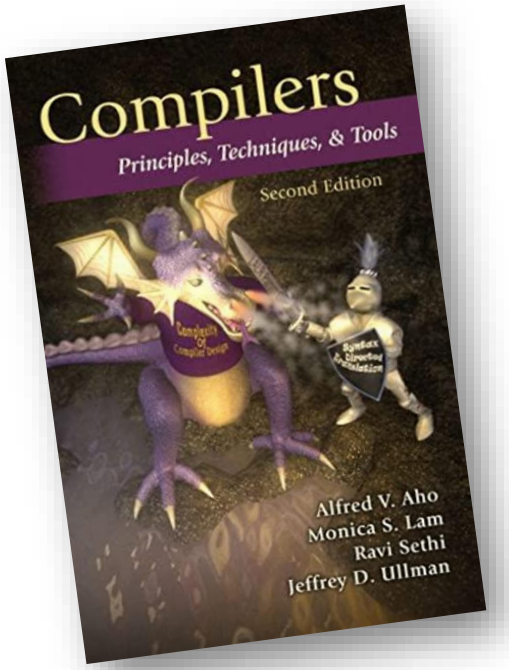
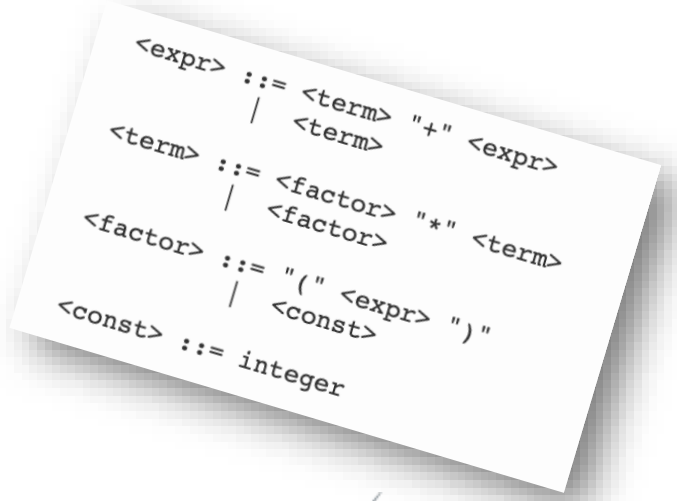
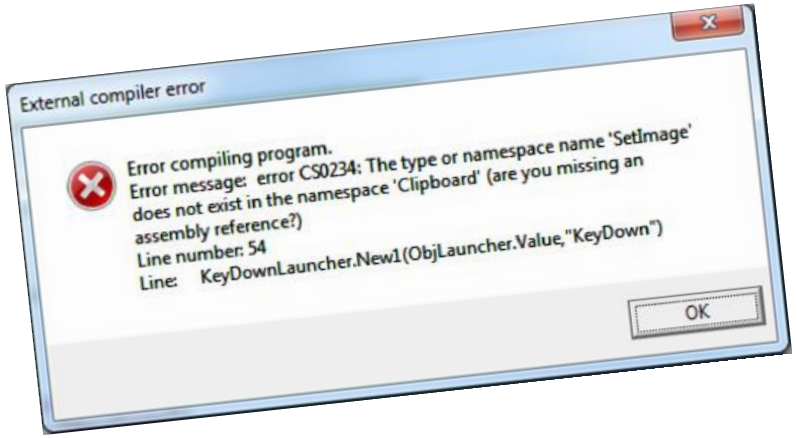
CSE110A: Fundamentals of Compiler Design

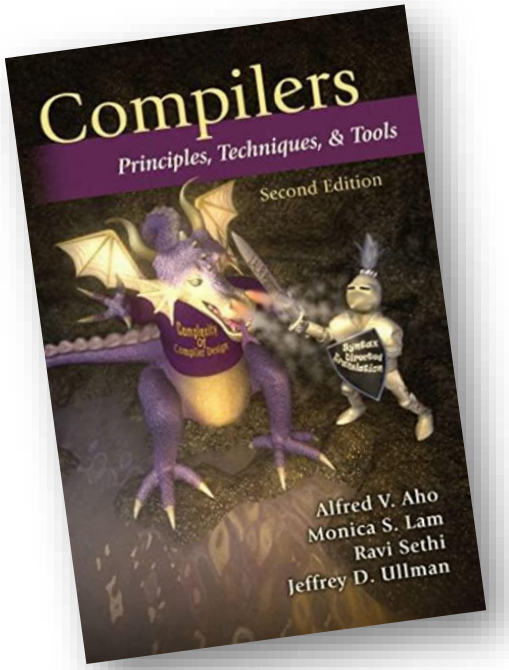


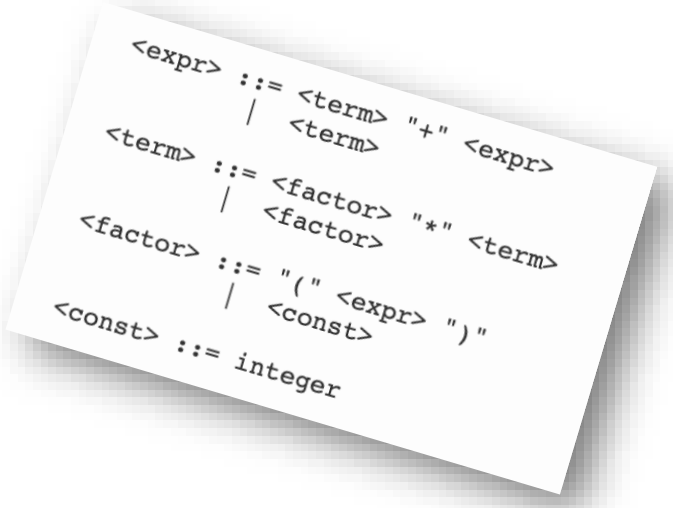
High Level Discussion on Compilers

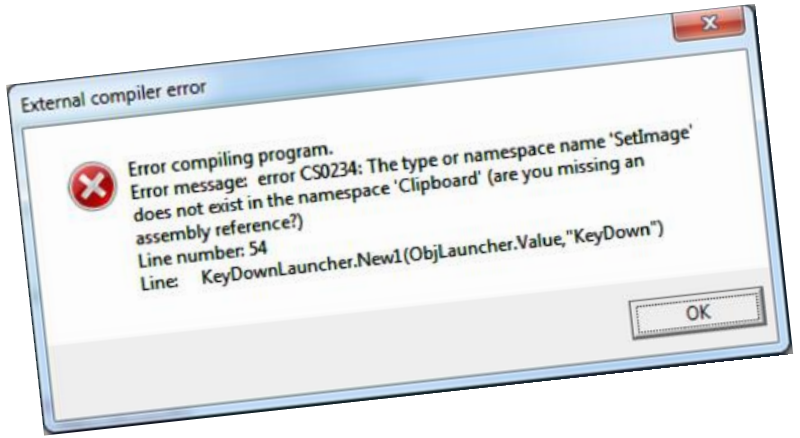




- **Questions**:
  - *What is a compiler?*
  - *What are some of your favorite compilers?*
  - *Have you ever built a compiler?*







What is a compiler?

What are some of your favorite compilers

```
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title: "Graduate Compiler Design"
layout: single
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### Welcome to **CSE211:** _Graduate Compiler Design_, Fall 2021 Quarter at UCSC!

- **Instructor:** [Tyler Sorensen](https://users.soe.ucsc.edu/~tsorensen/)
- **Time:** MWF 4:00 - 5:05 pm
- **Location:** Thimann Lab 101 (_in person!_)
- **Contact:** \<first name\>.\<last name\>@ucsc.edu


Hello! I'm Tyler  and welcome to the graduate compiler design course!

In this class you will learn about advanced topics in compiler design and implementation. In the abstract, compilers explore many of the [foundational problems in computer science](https://en.wikipedia.org/wiki/Halting_problem). In practice, compilers are [massive pieces of well-oiled software](https://www.phoronix.com/scan.php?page=news_item&px=MTg3OTQ), and are some of the engineering marvels of the modern world. Given the end of Dennard's scaling, compilers will play an increasingly important role to achieve further computational gains. _The main focus of this class is how compilers can make your code more efficient and safe on modern (and near-future) processors_.
```

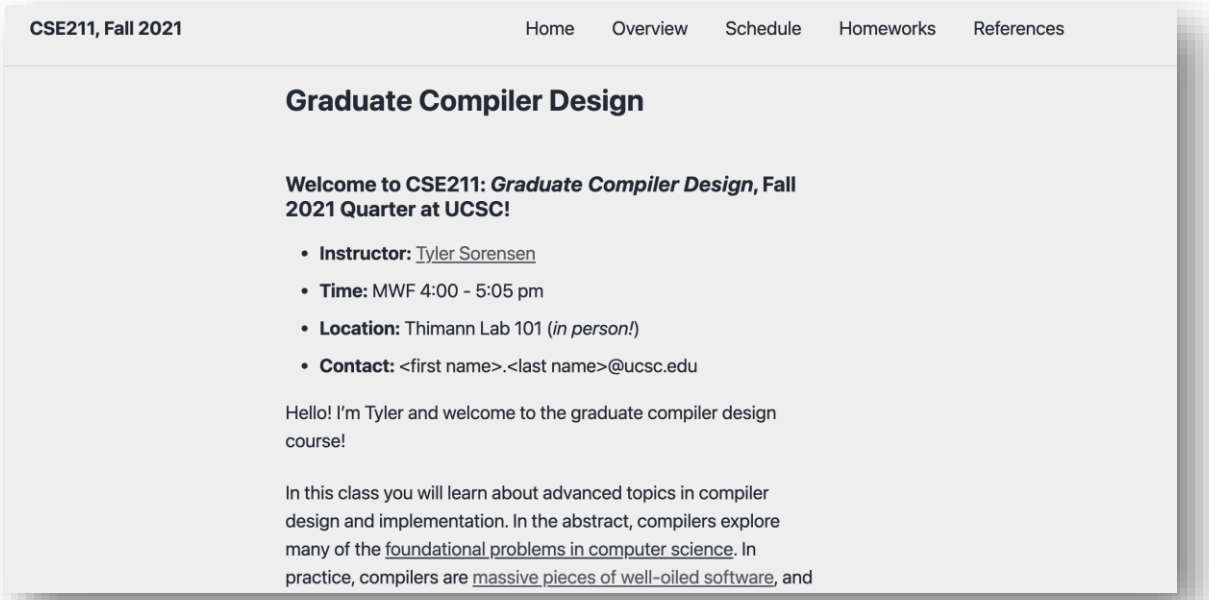

Building this website started with:

- Markdown to describe the page
- compiled with Jekyll to a static webpage
- static webpage is in HTML and javascript

Have you ever built a compiler?

What is a compiler?

What is a compiler?

Strings belonging to language L

Strings belonging to language L’

What is a compiler?

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A series of statements in programming language L

Strings belonging to language L’

often an executable binary file in an ISA language

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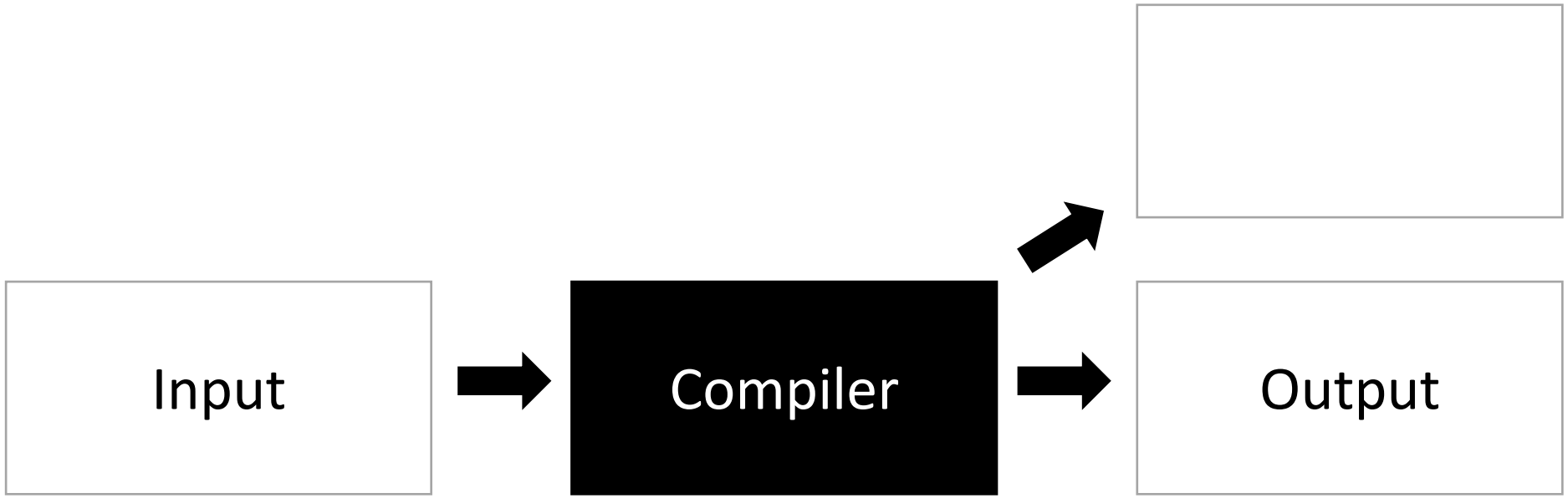

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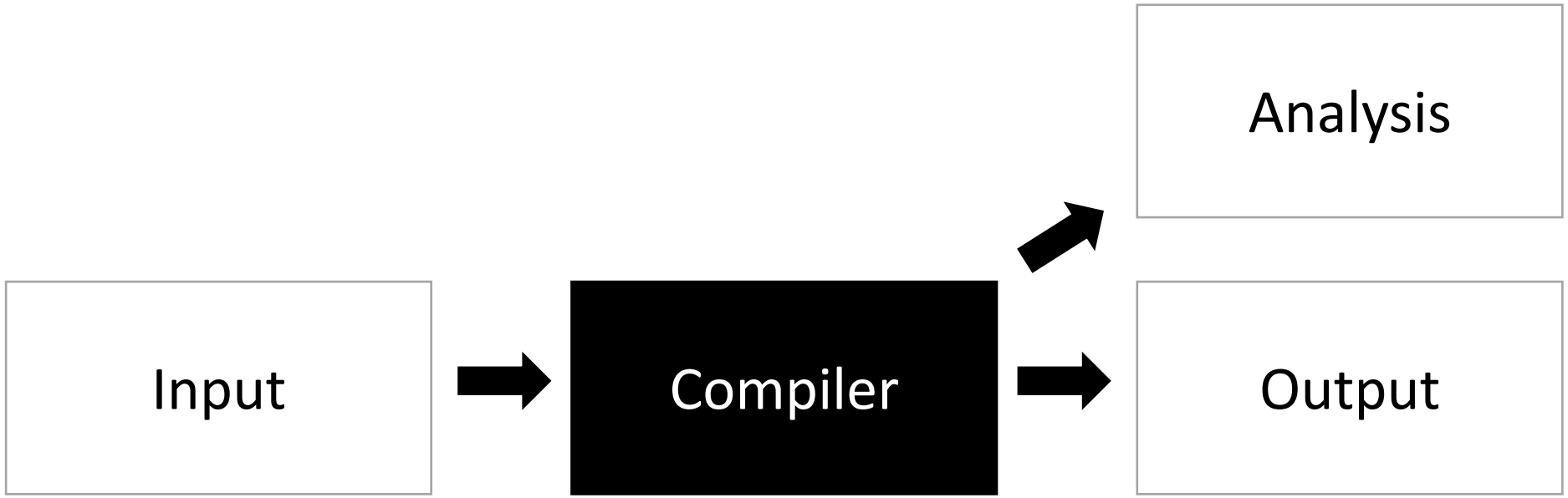
warnings



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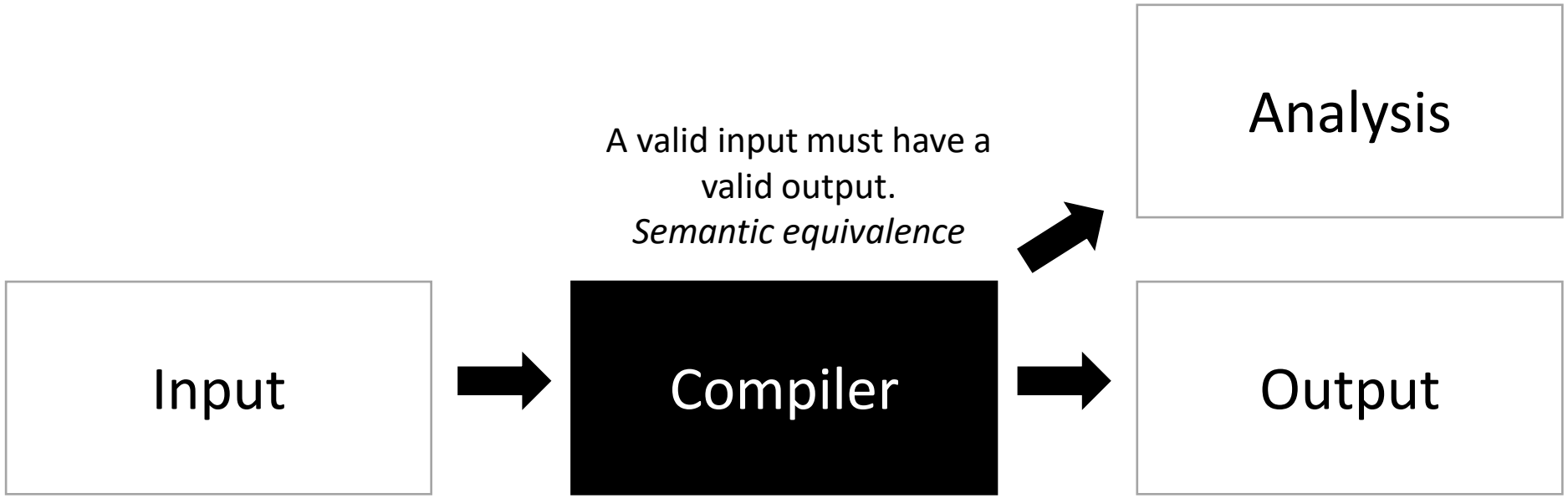

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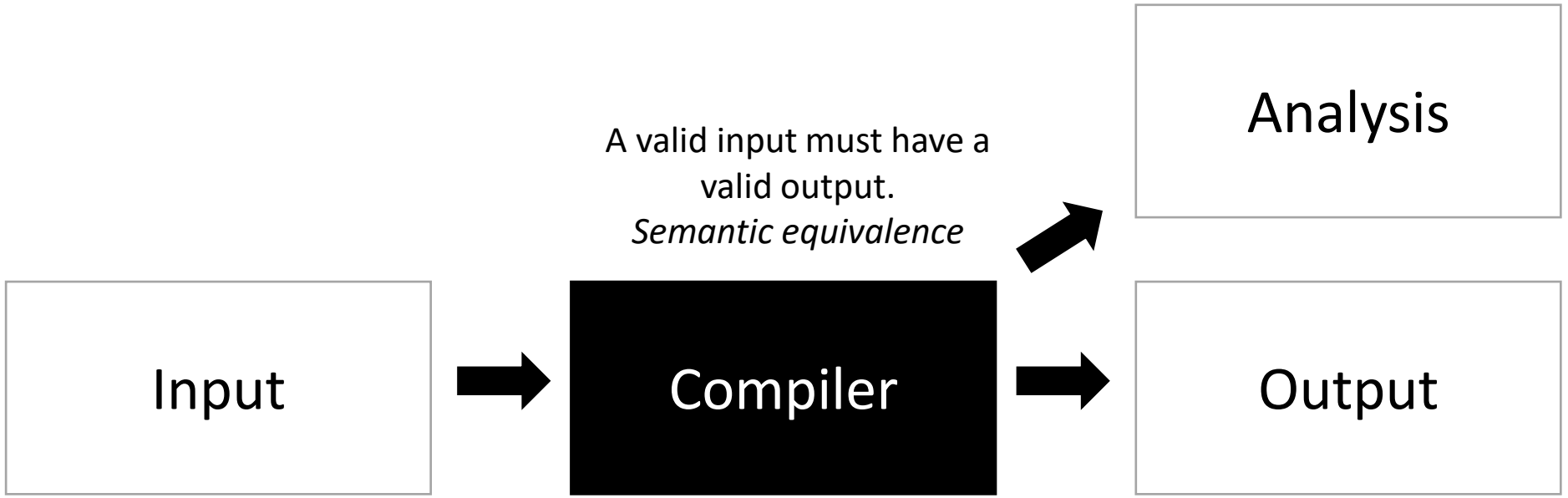

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What can happen when the Input isn't valid?

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What can happen when the Input isn’t valid?

```
int main() {
    int my_var = 5;
    my_var = my_car + 5;
}
```

Try running this through a compiler; you will get an error and a suggestion!

What can happen when the Input isn't valid?

```
int foo() {
   int *x = malloc(100*sizeof(int))
   return x[100];
}
```

What about this one ?

What can happen when the Input isn't valid?

```
int foo() {
   int *x = malloc(100*sizeof(int))
   return x[100];
}
```

What about this one ? No Error

Interpreters vs. Compilers

What is an Interpreter?
How does it differ from a compiler?

Interpreters vs. Compilers

Can a compiler be made into an interpreter?
Can an interpreter be made into a compiler?

Next Topics:

- **Review: Higher Level Discussion on Compilers** (01C)
- **And Journey: Journey Into the Heart of a Compiler** (02A)

back