

CS 161

Intro to CS I

More Programming and Conditional
Statements

Odds and Ends...

- Make demo appointment (signup homepage)
- Assignment #2 posted/due next Sunday.
- Recitation quiz (study)

Additional Operators

- Common operation: fetch/store same variable
 - `var=var + 2; //increment variable contents`
 - `var=var * 2; //double variable contents`
 - Assignment/operator combination (all ops supported):
 - `var += 2;`
 - `var *= 2;`
- Pre/Post increment/decrement: `++` and `--`
 - Example: `age++` vs. `++age`

Demo...

Decisions in Life

- What is a decision?
- When do we make decisions?
- How do we make decisions?
 - If it is sunny today
 - then I'll go to the beach and fly a kite
 - Else if it is raining today
 - then I'll stay inside and read a book
 - Else if it is snowing
 - then I'll go to the mountains to ski

Decisions within Decisions

- What happens if there is no wind at the beach?
- How does this change our decisions?

If it is sunny today

then I'll go to the beach

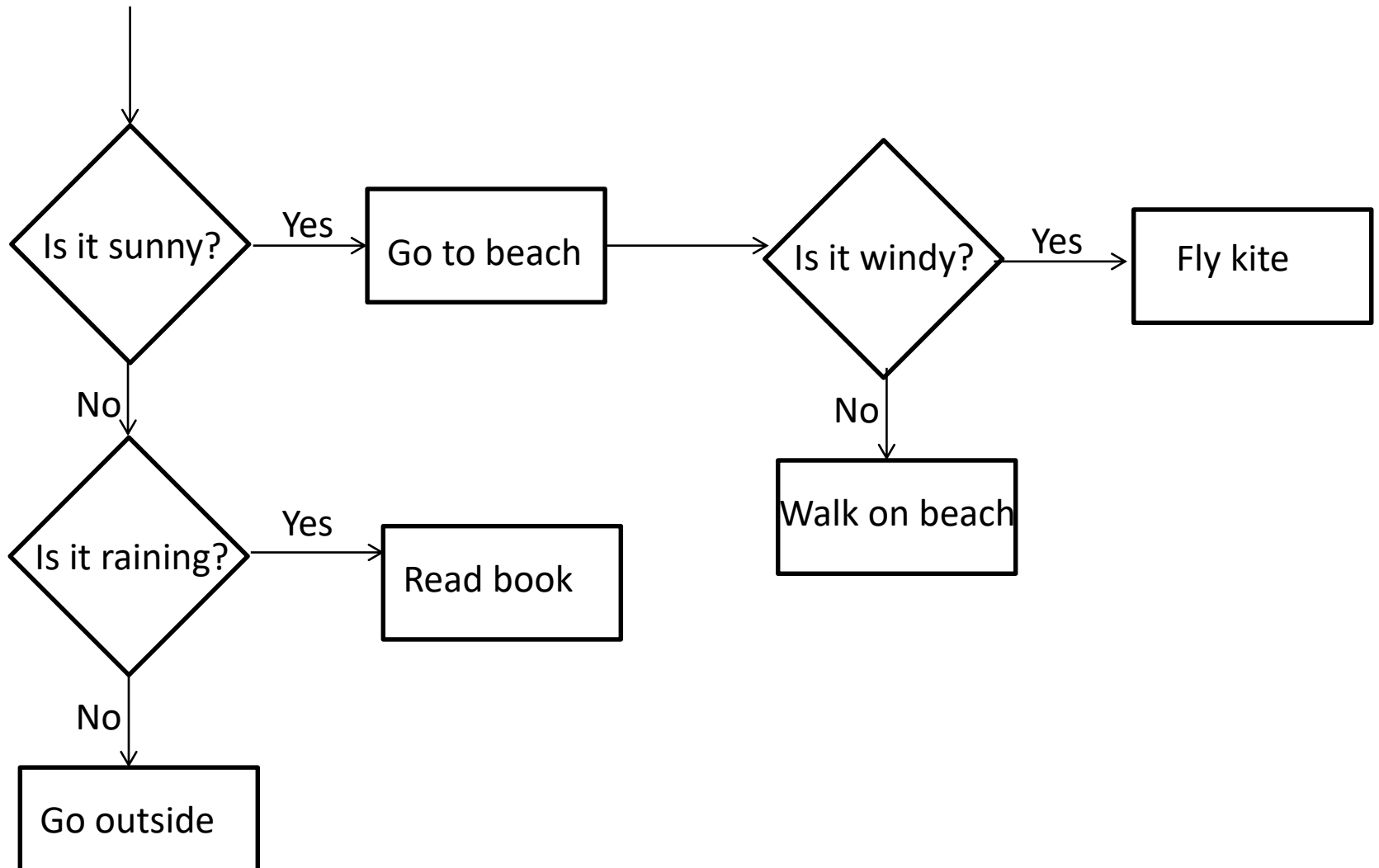
if it is windy at the beach

then I'll fly a kite

if it is not windy at the beach

then I'll walk on the shore

Flow chart for decisions



Decisions in our programs

- Use an if/else

```
if (<expression>) {  
    <statement>;  
    ...  
    <statement>;  
}  
else {  
    <statement>;  
    ...  
}
```


What is the <expression>?

Could be a relational expression:

<expression> <relational op> <expression>

- Relational Ops

== - equal to

!= - not equal to

< - less than

> - greater than

<= - less than or equal to

>= - greater than or equal to

Examples

- `if(2 + 1)`
- `if(2 - 4)`
- `if(2 - 2)`
- `if(4 == 4)`
- `if((2+1) == 4)`
- `if(4.1 != 4)`
- `if(3 <= 4)`
- `if(4 >= 4)`
- `if(3.5 > 4)`
- `if(4 < 4)`
- `if(3+2*2 > 9)`
- `if((3+2)*2 > 9)`

Logical Operators

- AND: `if((1>2) && (2<5))`
- OR: `if((1>2) || (2<5))`
- NOT: `if(!(1>2) && (2<5))`

- Precedence of Operators:
http://en.cppreference.com/w/cpp/language/operator_precedence

C++ If/Else Syntax...

```
if( x > y) {  
    std::cout << "X is greater than Y\n";  
}  
else {  
    std::cout << "X is less than Y\n";  
}
```

- When does this logic fail?

C++ If/Else...

```
if( x > y) {  
    std::cout << "X is greater than Y\n";  
}  
else if( x < y) {  
    std::cout << "X is less than Y\n";  
}  
else {  
    std::cout << "X is equal to Y\n";  
}
```

What are the curly braces for?

```
if( x > y)
```

```
    std::cout << "X is greater than Y\n";
```

```
else if( x < y)
```

```
    std::cout << "X is less than Y\n";
```

```
else
```

```
    std::cout << "X is equal to Y\n";
```

What if we are testing for ==?

```
if( x == 0) {  
    std::cout << "X is zero\n";  
}  
else if( x == 1) {  
    std::cout << "X is one\n";  
}  
else if( x == 2) {  
    std::cout << "X is two\n";  
}  
else {  
    std::cout << "You have entered an invalid number!!!\n";  
}
```

Demo...