

Pass by Value/Reference

Sharing data between functions

Pass by Value/Reference

- Pass by value
 - Data is copied
- Pass by reference
 - Data is aliased (i.e. pointers)

Pass by Value/Reference

```
void integerDivision(int a, int b,  
                    int *result,  
                    int *remainder) {  
    *result = a / b;  
    *remainder = a % b;  
}
```

Pass by Value/Reference

```
int x = 5;  
int y = 2;  
int value, remainder;  
integerDivision(x, y, &value, &remainder);  
printf("%d/%d = %d remainder %d\n", x, y,  
                                             value, remainder);
```


Pass by Value/Reference

```
int x = 5;  
int y = 2;  
int value, remainder;  
integerDivision(x, y, &value, &remainder);  
printf("%d/%d = %d remainder %d\n", x, y,  
remainder);
```

5/2 = 2 remainder 1

Stack Frame

Stack Frame

```
main()  
x = 5  
y = 2  
value = ?  
remainder = ?  
integerDivision()
```

Stack Frame

```
main()
```

```
x = 5
```

```
y = 2
```

```
value = ?
```

```
remainder = ?
```

```
integerDivision()
```

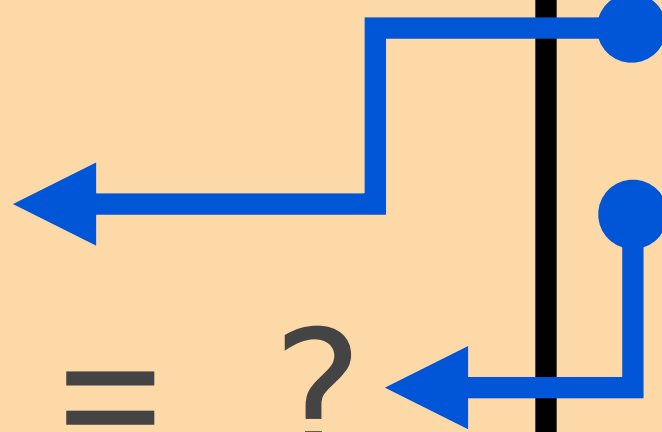
```
integerDivision()
```

```
a = 5
```

```
b = 2
```

```
• result
```

```
• remainder
```



Stack Frame

```
main()
```

```
x = 5
```

```
y = 2
```

```
value = 2
```

```
remainder = 1
```

```
integerDivision()
```

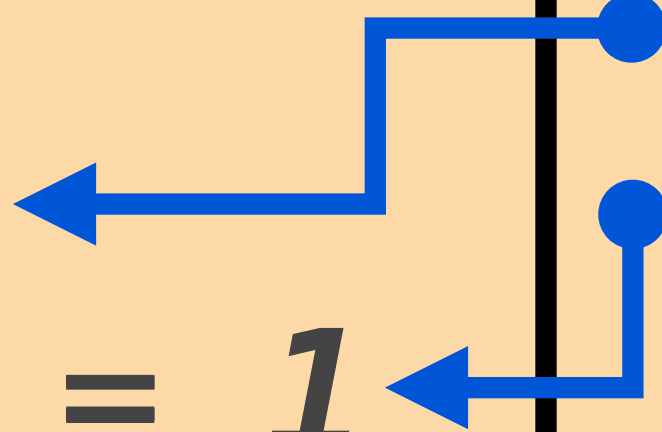
```
integerDivision()
```

```
a = 5
```

```
b = 2
```

```
result
```

```
remainder
```



Stack Frame

```
main()  
x = 5  
y = 2  
value = 2  
remainder = 1  
integerDivision()
```


Review

- Pass by value
- Pass by reference

