This is CS50.
cs50.brianyu.me
Week 1

• C
• Compiling
• Strings
• Variables
• Types
• Loops
• Conditions
• Imprecision
• Overflow
What questions do you have?
Today

Variables and Types
Loops and Conditions
Functions
PART ONE

Variables and Types
#include <stdio.h>

int main(void)
{
    printf("hello, world\n");
}

Compiling

```c
#include <stdio.h>

int main(void)
{
    printf("hello, world\n");
}

hello.c
```

```
01111111 01000101 01001100
01000110 00000010 00000001
00000001 00000000 00000000
00000000 00000000 00000000
00000000 00000000 00000000
00000000 00000010 00000000
00111110 00000000 00000001
00000000 00000000 00000000
10110000 00000101 01000000
00000000 00000000 00000000
...
```

```
... hello
```
Types

- bool
- char
- double
- float
- int
- long
- string
- ...
int x = 28;
variables

```c
int x = 28;
```

variable name
Variables

int x = 28;

type
Variables

```plaintext
int x = 28;

value
```
Variables

```java
int x = 28;
```

![Diagram showing variable x with value 28]
Variables

```java
int x = 28;
x = 50;
```
Variables

```c
int x = 28;
x = 50;
x = x + 1;
```

51
Variables

```java
int x = 28;
x = 50;
x += 1;
```

51
int x = 28;
x = 50;
x++;

51
Getting Input

```java
int x = get_int("Number: ");
```
Printing Values

printf("Hello, world!");
Printing Values

```c
int x = 50;
printf("The value is %i", x);
```
Operators

```java
int x = 10 + 4;
```

X

14
Operators

```c
int x = 10 - 4;
```
Operators

\[
\text{int } x = 10 \times 4;
\]

\[
\begin{array}{c}
\text{x} \\
40
\end{array}
\]
Operators

```
int x = 10 / 4;
```

The result of the division is 2.
Operators

```c
float x = 10.0 / 4.0;
```

\[ x = 2.5 \]
string name = "Emma";
printf("Hello, %s", name);
help50
check50
style50
PART TWO

Loops and Conditions
Conditions

if (x > 0)
{
    printf("x is positive\n");
}
Conditions

if (x > 0)
{
    printf("x is positive\n");
}
else
{
    printf("x is not positive\n");
}
Conditions

if (x > 0)
{
    printf("x is positive\n");
}
else if (x < 0)
{
    printf("x is negative\n");
}
else
{
    printf("x is 0\n");
}
Loops

```c
int x = 0;
while (x < 10)
{
    printf("%i\n", x);
    x++;
}
```
Loops

```c
int x = 0;
while (true)
{
    printf("%i\n", x);
    x++;
}
```
Loops

for (int i = 0; i < 10; i++)
{
    printf("%i\n", i);
}

for (int i = 0; i < 10; i++)
{
    printf("%i\n", i);
}
Loops

for (int i = 0; i < 10; i++) {
    printf("%i\n", i);
}
Loops

for (int i = 0; i < 10; i++)
{
    printf("%i\n", i);
}
Loops

for (int i = 0; i < 10; i++)
{
    printf("%i\n", i);
}

current to next

Loops

```c
for (int i = 0; i < 10; i++)
{
    printf("%i\n", i);
}
```
Exercise: Average

Write a program `average.c` that asks the user to provide ten integers as input and computes the sum.
Exercise: Multiplication Table

Write a program `multiplication.c` that prints out multiplication facts for multiplying all numbers from 1 to 10 by each other.

Sample Output:

\[
\begin{align*}
1 \times 1 &= 1 \\
1 \times 2 &= 2 \\
1 \times 3 &= 3 \\
\ldots \\
10 \times 9 &= 90 \\
10 \times 10 &= 100
\end{align*}
\]
PART THREE

Functions
Functions

```c
void hello(void) {
    printf("Hello!");
}
```
void hello(void)
{
    printf("Hello!"UNICATION);
}
Functions

void hello(void)
{
    printf("Hello!");
}

inputs
Functions

output type

void hello(void)
{
    printf("Hello!"PRECEDING);n
}

Functions

void hello(void)
{
    printf("Hello!");
}

function body
Functions

```c
void hello(void)
{
    printf("Hello!"瘙);
}
```
Functions

```c
void hello(int count)
{
    for (int i = 0; i < count; i++)
    {
        printf("Hello!");
    }
}
```
Functions

```c
int square(int x)
{
    return x * x;
}
```
int sum(int x, int y)
{
    return x + y;
}

Functions
Policies
Academic Honesty

- https://cs50.harvard.edu/college/2020/spring/syllabus/#academic-honesty
- "... be reasonable..."
- "... when asking for help, you may show your code to others, but you may not view theirs..."
Academic Honesty

• **Regret clause.** If you commit some act that is not reasonable but bring it to the attention of the course’s heads within 72 hours, the course may impose local sanctions that may include an unsatisfactory or failing grade for work submitted, but the course will not refer the matter for further disciplinary action except in cases of repeated acts.
Late Policy

• Late submissions (of quizzes, problem sets, the test, and the final project’s milestones) will be penalized at a rate of 0.1% per minute.

• However, you may grant yourself one 3-day (72-hour) extension during the term for any one problem set. (Form on course website.)
Problem Set 1
Problem Set 1

- Hello
- One of:
  - Mario (Less)
  - Mario (More)
- One of:
  - Cash
  - Credit
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