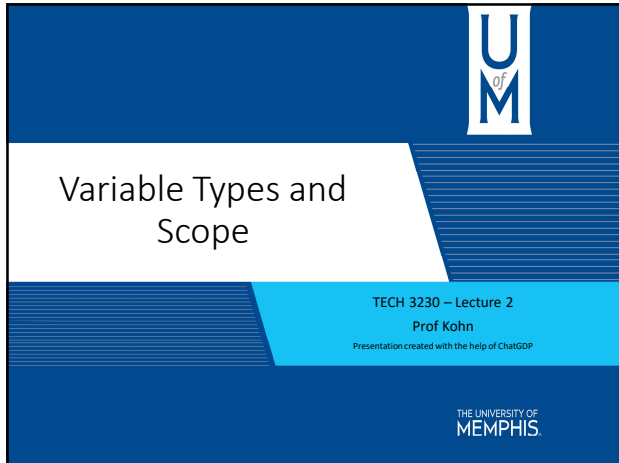




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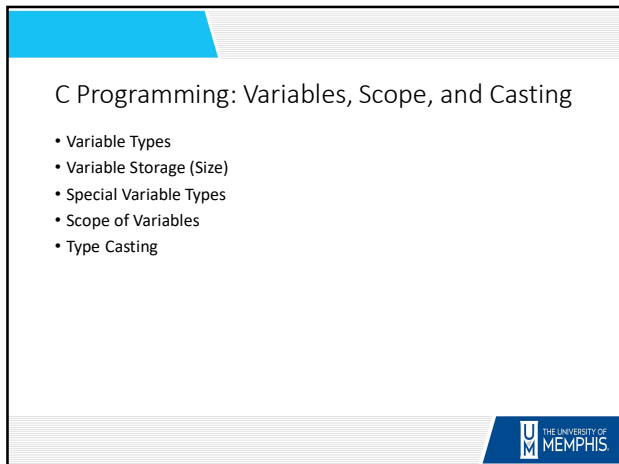
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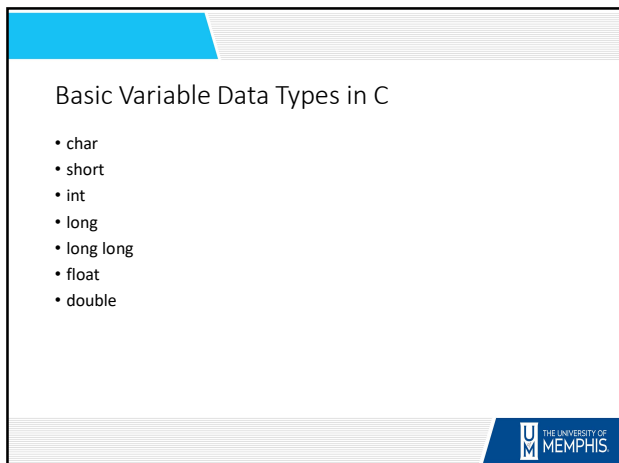
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### Typical Sizes (Bytes)

- char: 1
- short: 2
- int: 4
- long: 4 ~~or 8~~
- ~~• long long: 8~~
- float: 4
- ~~• double: 8~~

• Note: Crossed out variable types are not available in ATME Studio



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### Using sizeof()

```
#include <stdio.h>

int main() {
    printf("char: %zu\n", sizeof(char));
    printf("int: %zu\n", sizeof(int));
    printf("float: %zu\n", sizeof(float));
    printf("double: %zu\n", sizeof(double));
    return 0;
}
```



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### Important Notes

- Variable Byte Sizes vary by system (CPU)
- 32-bit vs 64-bit
- Compiler differences
- Always use sizeof()



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## Special Variable Types

### Used often

- Const
  - Read-only variable
  - `const int x = 10;`
- Volatile
  - Prevents optimization
  - `volatile int flag;`

### Used infrequently

- Static
  - Retains value
  - `static int count = 0;`
- Extern
  - Shared across files
  - `extern int globalVar;`
- Register
  - Stored in CPU register
  - `register int counter;`



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## Scope

- Local
- Global
- Block



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## Local Scope

- Inside function
- `int x = 5;`



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## Global Scope

- Outside functions
- `int globalVar = 10;`



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## Block Scope

- Inside {}
- `int y = 2;`



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## Type Casting

- Implicit
- Explicit



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## Implicit

- `float y = x;`



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## Explicit

- `int y = (int)x;`



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## Why Casting

- Control conversion
- Avoid data loss



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