Coding Review (I2P 2019)

Basic Syntaxes of C v1.0

Review of common syntaxes and concepts.

Operators

1. Explain the following code.

```
int a;
a = 1;
```

   Answer: (Write your answer here!)

2. What is the result of the following code?

```
#include <stdio.h>

int main(void) {
    int a = 0;
    if (a = 5)
        puts("a is 5");
    return 0;
}
```

   Answer: (Write your answer here!)

3. What is the result of the following code?

```
#include <stdio.h>

int main(void)
{
    int a = 1, b = 2;
    a = b = 3;
    printf("%d %d\n", a, b);
    return 0;
}
```

   Answer: (Write your answer here!)

4. What is the result of the following code?

```
#include <stdio.h>

int main(void) {
    int a = -1;
    puts("a is -1");
    if (-3 < a < 3)
        puts("-3 < a < 3 is True");
    else
        puts("-3 < a < 3 is False");
    if (-3 < a < 0)
        puts("-3 < a < 0 is True");
    else
        puts("-3 < a < 0 is False");
    return 0;
}
```

Answer: (Write your answer here!)

5. What is the result of the following code?

```
#include <stdio.h>
#define MAX 5

int main(void) {
    int i, a[MAX] = {1, 2, 3, 4, 5};
    for (i = 0; i < 1000000; i++) {
        if (i < MAX & a[i] < 3) {
            printf("%d\n", a[i]);
        }
    }
    return 0;
}
```

Answer: (Write your answer here!)

6. What is the result of the following code?

```
#include <stdio.h>
#define MAX 100

int main(void) {
    int i, top = -1, len = 0;
    int a[MAX], b[MAX];
    for (i = 1; i < 4; i++) {
        a[++top] = i;
        b[len++] = i;
    }
    for (i = 0; i < len; i++) {
        printf("a[%d] is %d\n", i, a[i]);
```

```
        printf("b[%d] is %d\n", i, b[i]);
    }
    return 0;
}
```

Answer: (Write your answer here!)

7. What is the result of the following code?

```
#include <stdio.h>

int main(void) {
    printf("The size of char is %zu\n", sizeof(char));
    printf("The size of short is %zu\n",sizeof(short));
    printf("The size of int is %zu\n", sizeof(int));
    printf("The size of long is %zu\n", sizeof(long));
    printf("The size of long long is %zu\n", sizeof(long long));
    printf("The size of unsigned long long is %zu\n", sizeof(unsigned long
long));
    printf("The size of float is %zu\n", sizeof(float));
    printf("The size of double is %zu\n", sizeof(double));
    return 0;
}
```

Answer: (Write your answer here!)

Conditional Statement

1. What is the result of the following code?

```
#include <stdio.h>

int main(void) {
    int a = 3;
    if (a < 0);
    {
        puts("a < 0?");
    }
    return 0;
}
```

Answer: (Write your answer here!)

2. What is the result of the following code?

```
```

```c
#include <stdio.h>

int main(void) {
    int a = 3;
    switch(a) {
        case 1: puts("1");
        case 2: puts("2");
        case 3: puts("3");
        case 4: puts("4");
        case 5: puts("5");
        default: puts("Default");
    }
    return 0;
}
```

Answer: (Write your answer here!)

3. What is the result of the following code?

```c
#include <stdio.h>

int main(void) {
    int a, b = 0, c;
    c = ((a=3<4)*4>5?7:(b=5)<<1%10?117:87);
    printf("%d %d %d\n", a, b, c);
    return 0;
}
```

Answer: (Write your answer here!)

4. What is the result of the following code?

```c
#include <stdio.h>

int main(void) {
play:
    puts("play");
    goto play;
    return 0;
}
```

Answer: (Write your answer here!)

Loops

1. What is the result of the following code?

```c
#include <stdio.h>

int main(void) {
    int i = 0;
    while (i < 3) {
        printf("%d\n", i);
        i++;
    }
    for (int j = 0; j < 3; j++) {
        printf("%d\n", j);
    }
    return 0;
}
```

Answer: (Write your answer here!)

2. What is the result of the following code?

```c
#include <stdio.h>

int main(void) {
    int T = 3;
    while (T--)
        printf("T is %d\n", T);
    printf("final T is %d\n", T);
    T = 3;
    while (--T)
        printf("T is %d\n", T);
    printf("final T is %d\n", T);
    return 0;
}
```

Answer: (Write your answer here!)

3. What is the result of the following code?

```c
#include <stdio.h>

int main(void) {
    int T = 0;
    do {
        printf("%d\n", T);
    } while (T--);
    int T2 = 0;
    printf("%d\n", T2);
    while(T2--) {
        printf("%d\n", T2);
    }
```

```
    return 0;
}
```

Answer: (Write your answer here!)

4. What is the result of the following code?

```
#include <stdio.h>

int main(void) {
    int i, j;
    for (i = 0; i <= 100; i += 10) {
        printf("i is %d\n", i);
        for (j = 0; j < 10; j++) {
            if (j % 2) continue;
            printf("j is %d\n", j);
        }
        if (!(i % 10)) break;
    }
    printf("final i is %d\n", i);
    printf("final j is %d\n", j);
    return 0;
}
```

Answer: (Write your answer here!)

Scope and Lifetime of Variables

We'll only discuss variables in a single file.

These concepts in multiple files are much more complicated, they'll be covered in the final project.

1. What is the result of the following code?

```
#include <stdio.h>

int a;

void func(int a) {
    printf("%d\n", a);
    {
        extern int a;
        printf("%d\n", a);
    }
    printf("%d\n", a);
    a = 4;
    printf("%d\n", a);
}

int main(void) {
```

```
    printf("%d\n", a);
    int a = 1;
    printf("%d\n", a);
    {
        int a = 2;
        printf("%d\n", a);
    }
    printf("%d\n", a);
    {
        extern int a;
        printf("%d\n", a);
    }
    printf("%d\n", a);
    a = 3;
    printf("%d\n", a);
    func(a);
    printf("%d\n", a);
    return 0;
}
```

Answer: (Write your answer here!)

2. What is the result of the following code?

```
#include <stdio.h>

int a = 117;

void func1() {
    int a = 0;
    a++;
    printf("func1 a is %d\n", a);
}

void func2() {
    static int a = 0;
    a++;
    printf("func2 a is %d\n", a);
}

void func3() {
    static int a;
    a = 0;
    a++;
    printf("func3 a is %d\n", a);
}

int main(void) {
    for (int i = 0; i < 3; i++)
        func1();
    for (int i = 0; i < 3; i++)
        func2();
```

```
    for (int i = 0; i < 3; i++)
        func3();
    printf("main a is %d\n", a);
    return 0;
}
```

Answer: (Write your answer here!)

Compiler Preprocessor (`#define`)

1. What is the result of the following code?

```
#include <stdio.h>

int a = 0;
#define a b
int a = 1;

int main(void) {
    printf("a is %d\n", a);
    printf("b is %d\n", b);
#undef a
    printf("a is %d\n", a);
    printf("b is %d\n", b);
    return 0;
}
```

Answer: (Write your answer here!)

2. What is the result of the following code?

```
#include <stdio.h>

int a = 10;

int func() {
    printf("%d\n", a);
}

#define a 117;

int main(void) {
    int b = a + 3;
    printf("%d\n", b);
    func();
    return 0;
}
```

Answer: (Write your answer here!)

3. What is the result of the following code?

```
#include <stdio.h>
#define ADD(X, Y) X+Y

int main(void) {
    int result;
    result = 2 * ADD(1, 2) * 4;
    printf("%d\n", result);
    return 0;
}
```

Answer: (Write your answer here!)

4. What is the result of the following code?

```
#include <stdio.h>
#define ever (;;)
#define forever(x) \
    for ever { puts(x); }

int main(void) {
    forever("alone");
    return 0;
}
```

Answer: (Write your answer here!)

For the next assignment, we'll review some basic recursions.

Epilogue

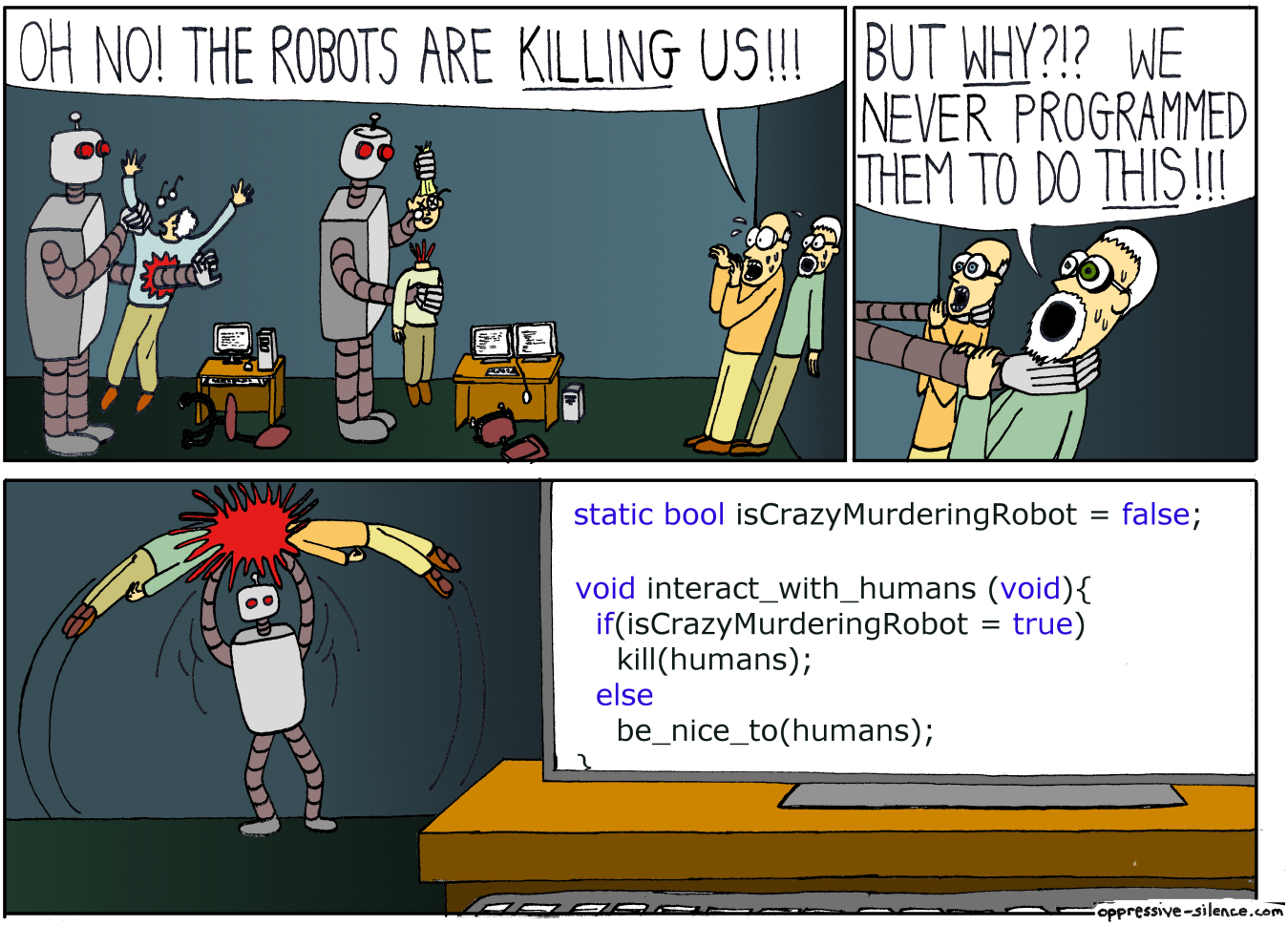

Photo Credit: on Oppressive Silence site by Ethan Vincent.

If there's any typo, please discuss on iLMS or email `j3soon@gapp.nthu.edu.tw`, I appreciate your help.