

CMSC 21 Lecture 4 Assignments

1. What is the output of the following program?

```
#include <stdio.h>

int main(void)
{
    int i;

    i = 1;
    while (i <= 128) {
        printf("%d ", i);
        i *= 2;
    }

    return 0;
}
```

Output: 1 2 4 8 16 32 64 128

2. Which one of the following statements is not equivalent to the other two (assuming that the loop bodies are the same)?

- a) while (i < 10) {...}
- b) for (; i < 10;) {...}
- c) do {...} while (i < 10);

Answer: C. Unlike the while and for loop, the do-while loop would still run the 1 time even if it doesn't meet the conditional ($i < 10$).

Example:

```
int i;
i = 11;

printf("while loop:\n");
while (i < 10) {
    printf("test %d", i);
    i--;
}

printf("for loop:\n");
for (; i < 10;) {
    printf("test %d", i);
    i--;
}

printf("do-while loop:\n");
do {
    printf("test %d", i);
    i--;
} while (i < 10);
```

Output:

```
while loop:
for loop:
do-while loop:
test 11
```

3. Convert item 1 into an equivalent for statement. You can validate your answer by checking if the produced outputs by both the while and for statements are similar.

Code:

```
#include <stdio.h>

int main(void){
    int i;

    for (i = 1; i <= 128; i *= 2){
        printf("%d ", i);
    }

    return 0;
}
```

Output:

1 2 4 8 16 32 64 128

4. Write a code that computes for the power of two:

Output:

```
This program prints a table of powers of two.
Enter number of entries in table: 6
    0      1
    1      2
    2      4
    3      8
    4     16
    5     32
    6     64
```

Code in as4.c

5. Write a program that displays a one-month calendar.

Output:

```
Enter number of days in month: 31
Enter the starting day of the week (1=Sun, 7=Sat): 4

      1  2  3  4
  5  6  7  8  9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31
```

Code in as5.c

GitHub Link:

<https://github.com/Megunut/CMSC-21/tree/main/Lecture%204>