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Lecture 4 Assignment

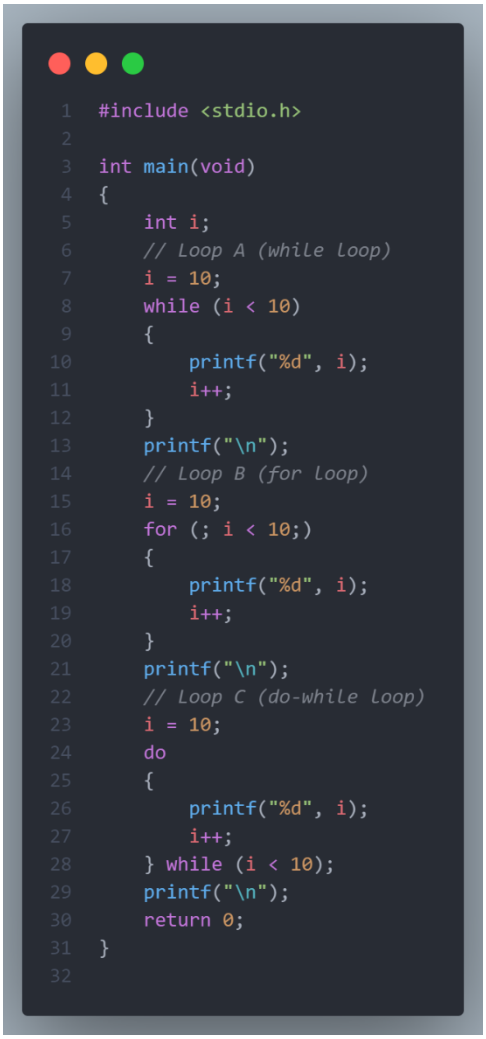
1.

```c
#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.



```c
#include <stdio.h>

int main(void)
{
    int i;
    // Loop A (while loop)
    i = 10;
    while (i < 10)
    {
        printf("%d", i);
        i++;
    }
    printf("\n");
    // Loop B (for loop)
    i = 10;
    for (; i < 10;)
    {
        printf("%d", i);
        i++;
    }
    printf("\n");
    // Loop C (do-while loop)
    i = 10;
    do
    {
        printf("%d", i);
        i++;
    } while (i < 10);
    printf("\n");
    return 0;
}
```

Loops A and B will only run if the condition is met. Loop C will run at least once even if the condition is not met. In my source code, I set the value of i to 10, and Loop C displayed 10 while Loops A and B displayed nothing.

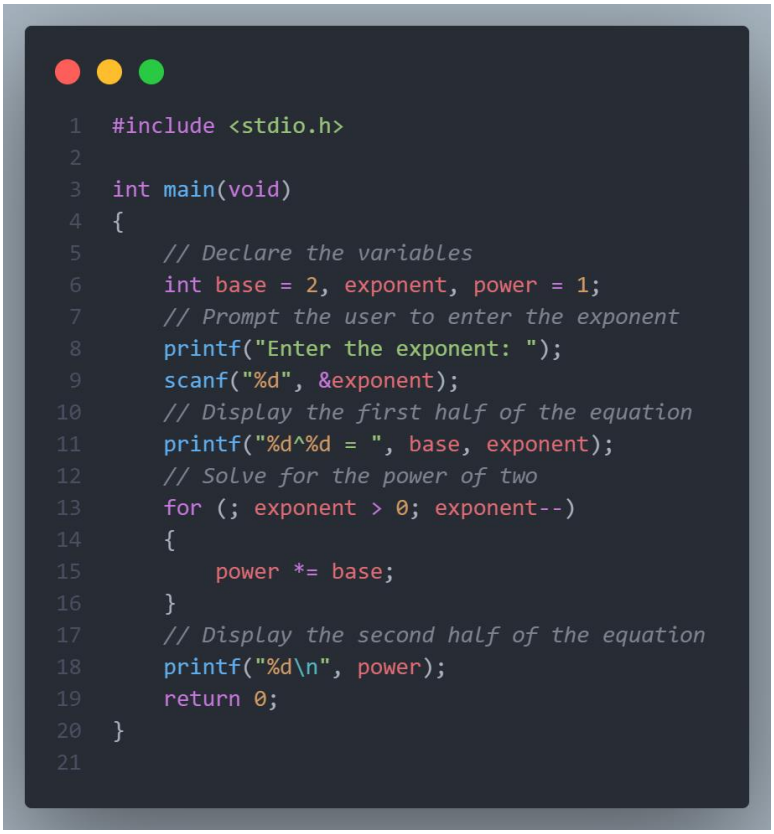
3.

```c
#include <stdio.h>

int main(void)
{
    int i;
    for (i = 1; i <= 128; i *= 2)
    {
        printf("%d ", i);
    }
    return 0;
}

```

4.



```c
#include <stdio.h>

int main(void)
{
    // Declare the variables
    int base = 2, exponent, power = 1;
    // Prompt the user to enter the exponent
    printf("Enter the exponent: ");
    scanf("%d", &exponent);
    // Display the first half of the equation
    printf("%d^%d = ", base, exponent);
    // Solve for the power of two
    for (; exponent > 0; exponent--)
    {
        power *= base;
    }
    // Display the second half of the equation
    printf("%d\n", power);
    return 0;
}

```

5.

```c
#include <stdio.h>

int main(void)
{
    // Declare the variables
    int month_days, start_day;
    // Check the validity of the days
    do
    {
        // Prompt the user to enter number of days in month
        printf("Enter number of days in month: ");
        scanf("%d", &month_days);
        if (month_days < 28 || month_days > 31)
        {
            printf("Invalid input! The number of days in month must be between 28 and 31.\n");
        }
    } while (month_days < 28 || month_days > 31);
    do
    {
        // Prompt the user to enter the starting day of the week
        printf("Enter the starting day of the week (1=Sun, 7=Sat): ");
        scanf("%d", &start_day);
        if (start_day < 1 || start_day > 7)
        {
            printf("Invalid input! The starting day of the week must be between 1 and 7.\n");
        }
    } while (start_day < 1 || start_day > 7);
    // Display the days of the calendar
    printf("Mon Tue Wed Thu Fri Sat Sun\n");
    // Display four spaces for every blank slot on the first week
    for (int day = 1; day < start_day; day++)
    {
        printf("    ");
    }
    // Display the number of days in month
    for (int day = 1; day <= month_days; day++)
    {
        // Assign three characters to each day and follow with a space
        printf("%3d ", day);
        // Go to the next line if reached the end of the current line
        if ((start_day + day - 1) % 7 == 0)
        {
            printf("\n");
        }
    }
    printf("\n");
    return 0;
}
```

GitHub: https://github.com/chstrkn/CMSC21