Loop/Repetition Statements
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;
}
```

Save your code as as1.c

Output: 1 2 4 8 16 32 64 128

```
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); Save your code

as as2.c

Answer: C

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.

Save your code as as3.c

```c
#include <stdio.h>

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

```
1 2 4 8 16 32 64 128
```

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

`Save your code as as5.c`

```c
#include <stdio.h>
int main() {
    int base, exp;
    long double result = 1.0;

    //base
    printf("Base=2\n");
    base=2;

    //exponent
    printf("Enter an exponent: ");
    scanf("%d", &exp);

    while (exp != 0) {
        result *= base;
        --exp;
    }

    //result/answer
    printf("Answer = %.0Lf", result);
    return 0;
}
```

```
Base=2
Enter an exponent: 10
Answer = 1024
```

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

```
Enter number of days in month: 31
Enter the starting day of the week (1=Sun, 7=Sat): 3

       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
```

There should be a user prompt to set:

- The number of days
- The day of the week on which the month begins.

Additionally, add checkers to validate whether the days entered are valid. For instance, the following number of days are invalid: 32, -1, 0, 27.

This addition will be a good refresher to our previous topic, selection statements.

`Save your code as as5.c`

```c
#include<stdio.h>

int main(void)
{
    int start_day, days_in_month, i, day_of_week;

    //number of days in month
    printf("Enter number of days in month: ");
    scanf("%d", &days_in_month);

    //starting day
    printf("(1=Sun, 2=Mon, 3=Tues, 4=Wed, 5=Thurs, 6= Fri, 7=Sat)");
    printf("\nEnter the starting day of the week: ");
    scanf("%d", &start_day);

    //checker
    if (days_in_month == 32)
    {
        printf("Invalid Input");
        return 0;
    }

    else if (days_in_month == -1)
    {
        printf("Invalid Input");
        return 0;
    }

    else if (days_in_month == 0)
    {
        printf("Invalid Input");
        return 0;
    }

    else if (days_in_month == 27)
    {
        printf("Invalid Input");
        return 0;
    }


    for(i = 1 ; i < start_day; i++) {
        printf("    ");
    }

    for(i = 1; i <= days_in_month; i++) {
        printf("%2d ", i);
        if((i + start_day - 1)%7 ==0) {
            printf("\n");
        }

    }
    return 0;
}
```

```
Enter number of days in month: 31
(1=Sun, 2=Mon, 3=Tues, 4=Wed, 5=Thurs, 6= Fri, 7=Sat)
Enter the starting day of the week: 7
                    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
```

Instructions for submissions

- Take screenshots of your codes for numbers which requires coding (e.g., 1, 2, 3) and embed it on the pdf along with an example output.
- Submit your answers in a pdf file with filename assignment2[surname].pdf
- Save the pdf file (assignment4[surname].pdf) and the codes in the directory:
  CMSC21/Lecture4/Assignments/
- Remember that you have initially created this repository for your reading assignment.
- Upload to github.
  - Download git cmd
  - Navigate to the CMSC21 Folder
  - For example (assuming your CMSC21 folder is in Documents)
    - `cd Documents/CMSC21`

- `git add –all`
- `git commit -m “Lecture 4 Assignment”`
- `git push -u origin main`
- Upload to LMS
- Include github link in the pdf document