Conditional Constructs: Exercise Solutions

Exercise 1

```c
#include <stdio.h>

int main(void) {
    float area, length, width;
    printf("Enter length and width: ");
    scanf("%f%f", &length, &width);
    area = length * width;
    printf("Area = %f.\n", area);
    return 0;
}
```

Exercise 2

```c
#include <stdio.h>
#include <stdlib.h>

int main(void) {
    int sum = 0;   /* the sum of the relevant odd numbers */
    int i; /* loop index */
    int number;    /* the input number */
    printf("Enter a number: ");
    scanf("%d", &number);
    if (number < 0) {
        printf("Error: the number must be non-negative.\n");
        exit(1);
    }
    for (i = 0; i < number; i++) {
        if (i % 2) { /* alternatively, we can use "if ((i % 2) == 1) {" */
            sum += i;
        }
    }
    printf("The result is: %d.\n", sum);
    return 0;
}
Exercise 3

```c
#include <stdio.h>

int main(void) {
    int daysInMonth;
    int startingDay;
    const int daysInWeek = 7;
    int currentColumn; /* The current column of output. */
    int i;
    int currentDay;

    printf("Enter number of days in month: ");
    scanf("%d", &daysInMonth);
    printf("Enter starting day of the week (1=Sun, 7=Sat): ");
    scanf("%d", &startingDay);

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

    currentDay = 1;
    while (currentDay <= daysInMonth) {
        printf("%2d ", currentDay);
        currentDay++;
        if (currentColumn == daysInWeek) {
            currentColumn = 1;
            printf("n");
        } else {
            currentColumn++;
        }
    }
    printf("n");

    return 0;
}
```
Exercise 4

#include <stdio.h>
#include <stdlib.h>

/* The salary of an employee before commissions. */
#define BASE_SALARY 50000

int main(void) {

    /* Boundaries between commission levels. */
    const int firstLevelLimit = 5000;
    const int secondLevelLimit = 10000;
    const int thirdLevelLimit = 20000;
    const int fourthLevelLimit = 50000;

    float totalSalary;  /* The total salary --- commission plus base. */
    float sales;        /* The input sales figure. */
    float commission;   /* Level-based commission percentage. */

    printf("Enter a salesperson’s annual sales figure: ");
    scanf("%f", &sales);

    if (sales < 0) {
        printf("Error: negative sales.\n");
        exit(1);
    }

    if (sales < firstLevelLimit) {
        commission = 0.01;
    } else if (sales < secondLevelLimit) {
        commission = 0.02;
    } else if (sales < thirdLevelLimit) {
        commission = 0.03;
    } else if (sales < fourthLevelLimit) {
        commission = 0.04;
    } else {
        commission = 0.05;
    }

    totalSalary = BASE_SALARY + (commission * sales);
    printf("The total salary is $%f\n", totalSalary);

    return 0;
}