Lab 6 (4 questions)

Ex1

Write a program that keeps prompting the user to input a non-negative integer. The program should stop when the input is negative.

Sample run:

Enter a number: 12

Enter a number: 0

Enter a number: 26

Enter a number: 5

Enter a number: -1

You are required to use pointers in your program. Follow the skeleton program below

```
#include <stdio.h>
int main(void) {
    //1. Declare all variables and pointers first.
    //   Pointers must end with "_ptr"


    //2. Fill in your code below.
    //   Your logic should use only pointer variables declared above

}
```

Ex2

Write a C program that calculates the sum of integers between 9 and 300 inclusive which are divisible by 7 but not divisible by 63.

Sample run:

Sum of integers between 9 & 300 that are divisible by 7 but not by 63 is 5684

You are required to use pointers in your program. Follow the skeleton program below

```
#include <stdio.h>
int main(void) {
    //1. Declare all variables and pointers first.
    //   Pointers must end with "_ptr"


    //2. Fill in your code below.
    //   Your logic should use only pointer variables declared above

}
```

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Ex3

Given a person's weight in kilograms and height in meters, his/her BMI (Body Mass Index) is calculated based on this formula:

BMI = Weight / Height^2

The following table shows the body types according to a person's gender and BMI:

Message	Female	Male
You are a little skinny	BMI <= 19	BMI <= 20
You are in good shape	19 < BMI <= 24	20 < BMI <= 25
You are a little big	BMI > 24	BMI > 25

Write a program bmi.c to do the following:

Read the user's gender (0 for female or 1 for male), weight (double) and height (double).

Calculate the BMI and display a suitable message.

Your program must use switch

Sample run 1:

```
Enter your gender (0 for female, 1 for male): 0
Enter your weight (kg) and height (m): 62 1.6
You are a little big
```

Sample run 2:

```
Enter your gender (0 for female, 1 for male): 1
Enter your weight (kg) and height (m): 62 1.6
You are in good shape
```

Sample run 3:

```
Enter your gender (0 for female, 1 for male): 1
Enter your weight (kg) and height (m): 61.5 1.8
You are a little skinny
```

You are required to use pointers in your program. Follow the skeleton program below

```
#include <stdio.h>
int main(void) {
    //1. Declare all variables and pointers first.
    //   Pointers must end with "_ptr"


    //2. Fill in your code below.
    //   Your logic should use only pointer variables declared above

}
```

Ex4

Write a program **pointers.c** to read in a positive integer **a** and a positive real number **b**. As long as $a < b^2$, you repeatedly multiply a by b and assign the product back to a.

For example, if a = 3 and b = 9.5, then $a < b^2$ is true and hence a is updated to 28 (3 × 9.5, and truncated to integer). Next, $a < b^2$ is still true so a is updated to 266 (28 × 9.5). Since $a < b^2$ is now false, the loop terminates with the value of 266 in a.

The skeleton program is given. You are to complete the program such that accesses to a and b are done only through their respective pointers **a_ptr** and **b_ptr**. The value of b is displayed in 2 decimal places.

No other variables should be added in your program.

You are required to use pointers in your program. Follow the skeleton program below

```
#include <stdio.h>
int main(void) {
    int a, *a_ptr;
    float b, *b_ptr;

    printf("Enter an integer: ");
    scanf("%d", &a);

    printf("Enter a real number: ");
    scanf("%f", &b);


    // Fill in your code below.
    // Your logic should use only pointer variables declared above

}
```

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Sample run:

Enter an integer: 3

Enter a real number: 9.5

Values entered are 3 and 9.50

Final value of a = 266