

Student Name: **KEY SOLUTION** ID:

A data file named "Reals.txt" contains positive and negative real numbers and number of digits in the decimal part. Write a code that reads each number from the file, if the number has non-zero decimal part, the code should then separate the sign, the integer and the decimal parts and save them in a new file.

A function named *splitFun()* takes the number as input, and if the number has non-zero decimal part it should return the sign as a character ('+' or '-'), the integer and the decimal parts. The decimal part should have the number of digits specified by the second number in the file. The function should take the real number as input, and returns 1 if the number has non-zero decimal part, and 0 otherwise. Any test should be made inside the function. The output is saved to a new file named "Results.txt", as follows: Sign,

Integer part, Decimal part.

Sample Program Run:

2.35	2
-1.00	2
2.01	2
5.00	2
3.45	4
-82.569	3
87.369	3
.258	3

number	sign	int. part	dec. part
2.35000	+	2	35
2.01000	+	2	0
3.45000	+	3	4500
-82.56900	-	82	569
87.36900	+	87	368
0.25800	+	0	258

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

```
int splitFun(double x, int p, char *sign, int *integer, int *decimal);
```

```
int main(void){
    double x;
    int i, d, p;
    char s;
    FILE *inFile, *outFile;
    inFile = fopen("Reals.txt", "r");
    if (inFile == NULL){
        printf("Error opening file !");
        exit(1);
    }
    outFile = fopen("Results.txt", "w");
    fprintf(outFile, " number \tsign int. part dec. part\n");
    fprintf(stdout, " number \tsign int. part dec. part\n");
    while(fscanf(inFile, "%lf%d", &x, &p) != EOF){
        if(splitFun(x, p, &s, &i, &d)){
            fprintf(outFile, "%10.5f \t%c \t %5d \t %5d\n", x,s,i,d);
            fprintf(stdout, "%10.5f \t%c \t %5d \t %5d\n", x,s,i,d);
        }
    }
    fclose(inFile);
    fclose(outFile);
    return 0;
}

int splitFun(double x, int p, char *sign, int *integer, int *decimal){
    double d;
    if(x == (int)x) // If number has zero decimal part
        return 0;
    if(x > 0) // Extract sign '+'
        *sign = '+';
    else
        *sign = '-'; // Sign '-'
    x = fabs(x); // Extract integer part
    *integer = (int)x;
    *decimal = (x - *integer)*pow(10.0, p); // Extract decimal part
    return 1;
}
```