

Handout 9

Practice for Exam 1

9.1 Add the positive terms

Write a computer program as follows:

- The input is 100 numbers (of type double).
- The output is the sum of all of the numbers that are positive.

Hint: First build a test program that takes in 5 numbers and returns the sum of the positive ones. For the test program, the input

```
1 -2 3 -4 5
```

should have the output of 9.

9.2 Sums of squares

Write a computer program as follows:

- The input is two integers n and N
- If $n < N$ then the output is the sum $n^2 + (n + 1)^2 + \dots + N^2$. If $n \geq N$, then the program returns a message saying the input was not valid.

For example, if the input is

```
2 6
```

then the program returns the result of $2^2 + 3^2 + 4^2 + 5^2 + 6^2$.

If the input is

```
4 2
```

then the program returns a message saying that the input was not valid.

9.3 Approximate π

Use the formula

$$\pi = 4 \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} \dots \right)$$

to construct an approximation of π .

- The input to the program should be an integer greater than zero.
- The output of the program should be the sum of that many terms in the approximation. (If the input is not a positive integer, then the code should return an error message.)

Example: If the input is

3

Then the output is the result of $4 \left(1 - \frac{1}{3} + \frac{1}{5} \right)$.

Another example: If the input is

-2

then the output is some message telling the user that the input was not valid.

9.4 List the factors

Write a program as follows.

- The input is an integer larger than zero.
- The output is a list of all the positive integers that evenly divide in to the number.

For example, if the input is

12

then the output is

The following numbers divide in to 12:
1, 2, 3, 4, 6, 12

As another example, if the input is

18

then the output is

The following numbers divide in to 18:
1, 2, 3, 6, 9, 18