

PYTHON - NOTES V - INPUT & OUTPUT

Solving problems in programming competitions requires handling input/output. Competitions either work with

- standard input/output: where input/output is accomplished using certain built-in functions, or
- file input/output: where input/output is accomplished via reading and writing to files.

For example, Codeforces requires the former, whereas the AIO requires the latter.

Standard Input/Output. Here we use the built-in functions `input()` and `print()`.

This reads in a single line.

```
firstline = input()
```

This reads in a series of numbers on one line and converts them into a list.

```
firstline = [int(x) for x in input().split()]
```

This prints a string.

```
print('string')
```

File Input/Output. Here we read and write to text files.

This following code stores the lines of input as a list.

```
lines = open('input.txt', 'r').readlines()
```

The first line can be extracted as follows.

```
firstline = lines[0]
```

The first line can be split into a list as follows.

```
firstline = lines[0].split()
```

Similar code can be used to extract subsequent lines. After extracting the input data, some processing occurs. Then the end result is written to an output file.

The following code writes a string into a text file.

```
outputfile = open('output.txt', 'w')
outputfile.write(string)
outputfile.close()
```

Writing strings on multiple lines in a text file can be done as follows.

```
outputfile.write(string1 + '\n' + string2)
```

An alternative approach to file input/output is to simply redirect the system input and output to files, and then use the built-in functions described earlier for standard input/output. To do this add the following to your code, and then use `input()` and `print()` as needed.

```
import sys
sys.stdin = open('input.txt', 'r')
sys.stdout = open('output.txt', 'w')
```