

Programming Challenge: Python & make Challenge

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1 Programming Challenge: Python

2 make Challenge

The Python Script

```
#!/usr/bin/python
import os,sys

def rmSpaces(input_file, output_file):
    if input_file==output_file:
        sys.stderr("Error: path to input and output file is identical.")
        exit()
    if not os.path.exists(input_file):
        sys.stderr.write("Error: input file does not exist.")
        exit()
    if os.path.exists(output_file):
        print "Warning: output file does already exist, it will be overwritten."

    fileOUT = open(output_file,"w")
    for line in open(input_file):
        fileOUT.write(line.replace(" ", ""))
    fileOUT.close()
```

The Main Method

```
if __name__ == "__main__":
    import argparse
    parser = argparse.ArgumentParser(description='This script reads a file, removes all spaces
    parser.add_argument('-i', metavar='str', type=str, required=True, help='input file')
    parser.add_argument('-o', metavar='str', type=str, required=True, help='output file')
    args = parser.parse_args()
    arguments = vars(args)
    input_file = arguments['i']
    output_file = arguments['o']
    rmSpaces(input_file, output_file)
```

```
usage: rmSpaces.py [-h] -i str -o str
```

This script reads a file, removes all spaces and writes the result into a file.

optional arguments:

```
-h, --help  show this help message and exit
-i str      input file
-o str      output file
```

setup.py

```
#!/usr/bin/python
```

```
from distutils.core import setup
setup( name='rmSpaces',
      version='1.0',
      description='Removes all spaces from a file and saves it into another file.',
      author='Verena Prade',
      author_email='verena.prade@gmx.de',
      py_modules=['rmSpaces'],
      requires=['argparse']
)
```

Commands:

```
$ python setup.py sdist
```

rmSpaces-1.0.tar.gz will be in **dist** folder

```
$ tar -zxvf rmSpaces-1.0.tar.gz
```

```
$ python setup.py install
```

setuptools

With the `requires` argument in `distutils.core.setup()`, required packages are documented, but they will not be installed automatically.

Use `setuptools` instead:

`install_requires`

`dependency_links`

specifies the required modules

specifies the location (url) of the modules

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Preparation

make **Tutorial:** <http://mrbook.org/tutorials/make/>

→ out of date

→ in main.cpp and hello.cpp change:

```
#include <iostream.h> → #include <iostream>
```

→ and add this line:

```
using namespace std;
```



```
#!/usr/bin/make -f
all:
    head *.xxd *.chk

first.name: full.name
    cut -d " " -f 1 full.name > first.name

last.name: full.name
    cut -d " " -f 2 full.name > last.name

full.xxd: full.name
    xxd full.name > full.xxd

full.chk: full.name
    shasum full.name > full.chk

help:
    @echo "Usage:"
    @echo "./Makefile [OPTION]"

clean:
    rm -f first.name last.name *.xxd *.chk

.PHONY: clean help
```

Rule:

target: components

[tab] commands

} identical for first and last

```

#!/usr/bin/make -f
NAME=full first last

all:
    head *.xxd *.chk

first.name: full.name
    cut -d " " -f 1 full.name > first.name

last.name: full.name
    cut -d " " -f 2 full.name > last.name

$(NAME)=.xxd): %.xxd:%.name
    xxd $< > $@

$(NAME)=.chk): %.chk:%.name
    shasum $< > $@

help:
    @echo "\nUsage:"
    @echo "./Makefile [OPTION]"
    @echo "\nOptions:"
    @echo "[first.name | last.name |"
    @echo "full.xxd | first.xxd | last.xxd |]"
    @echo "full.chk | first.chk | last.chk]"
    @echo "clean | help ]"
    @echo "\nEffect of these options:"
    @echo "*.name \t creates the corresponding name file."
    @echo "*.xxd \t creates the corresponding xxd file."
    @echo "*.chk \t creates the corresponding chk file."
    @echo "clean \t removes all created files.\n"

clean:
    rm -f first.name last.name *.xxd *.chk

.PHONY: clean help

```

- NAME is a variable
- \$(abc:c=x) : function call that changes abc to abx
- % wildcard
- \$< name of the first prerequisite
- \$@ target of a rule
- @ before a command prevents it from being printed

Bibliography

 distutils.core - Core Distutils functionality.

docs.python.org/2/distutils/apiref.html#module-distutils.core (May 5th, 2013)

 Getting Started With setuptools and setup.py

http://pythonhosted.org/an_example_pypi_project/setuptools.html (May 5th, 2013)

 Makefiles by example, Hector Urtubia.

<http://mrbook.org/tutorials/make/> (May 1st, 2013)

 GNU Make Manual (July 28th, 2010).

<http://www.gnu.org/software/make/manual/> (May 1st, 2013)

http://www.gnu.org/software/make/manual/html_node/Automatic-Variables.html#Automatic-Variables (May 5th, 2013)