

Exercise 2: Design by Contract

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Figure 1 shows a BON diagram of a printing service. The class `PRINTER` is a deferred class which defines printers. It has a procedure `print(f:FILE)` which prints a file. In `PRINTER`, `print(f:FILE)` requires True. The class `TEXT_PRINTER` inherits from `PRINTER` and redefines the procedure `print(f:FILE)`. In `TEXT_PRINTER` `print(f:FILE)` only prints text files so, it requires the file `f` is a text file. Furthermore, the class `POSTSCRIPT_PRINTER` also inherits from `PRINTER` and redefines `print(f:FILE)`. In `POSTSCRIPT_PRINTER` `print(f:FILE)` only prints postscript files. Thus, it requires the file `f` is a postscript file.

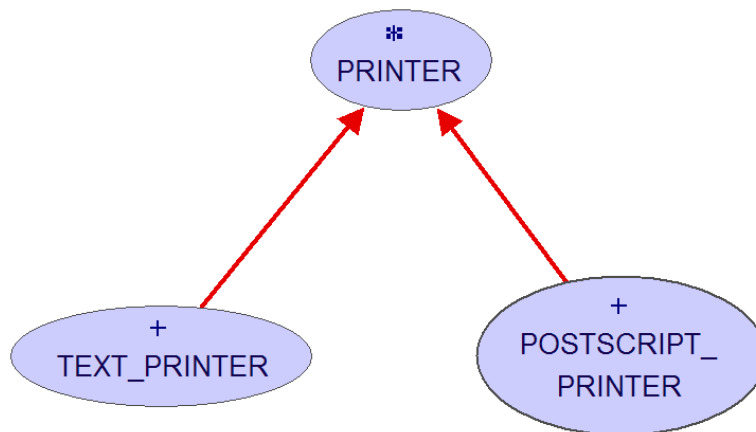


Figure 1: BON diagram of a printing service.

Assuming the class `FILE` is already defined and contains the functions:

- `is_text_file`: `BOOLEAN` which returns true iff the file is a text file
- `is_postscript_file`: `BOOLEAN` which returns true iff the file is a postscript file

write the contracts for the procedure `print` in the classes `PRINTER`, `TEXT_PRINTER`, `POSTSCRIPT_PRINTER`.