

## 10.3.1 Details of the simple text formatter

In the section we describe the details of the simple text formatter.

The overall structure of class Document is the following:

```
class Document(temp: ref Template, lineMax: var integer):  
  :::  
  content: obj OrderedList(Paragraph)  
  addParagraph(theContent: var String, theStyle: ref Style):  
    content.insert(Paragraph(theContent, theStyle))  
  :::
```

A Document has the following attributes:

- A data-item content, which is an OrderedList of the Paragraphs in a given Document.
- A method addParagraph that inserts a new Paragraph with arguments theContent and theStyle into content.

Next we have added format methods to Document and Paragraph:

```
class Document(temp: ref Template, lineMax: var integer):  
  class Paragraph(theContent: var String, theStyle: ref Style):  
    format -> formattedPar: var String:  
      formattedPar := theStyle.format(theContent, lineMax)  
    ...  
  format -> formattedDoc: var String:  
    formattedDoc := ""  
    content.scan  
      formattedDoc := formattedDoc + current.format  
  print:  
    print(format)
```

- The format method for Paragraph returns a String in formattedPar as computed by invoking theStyle.format(theContent, lineMax).
- The format method of Document returns a String in formattedDoc by adding the formatted strings for each Paragraph in the content (content) of the Document.
- Finally the print method prints the String returned by invoking the format method of the Document.

For class Template, we just add the data-item styles which is an OrderedList of possible styles that are defined for the Template - it is not used in the examples, and we leave it to the reader to make use of it. In addition we add an inner(Template).

```
class Template:  
  styles: obj OrderedList(Style)
```

```

heading: ref Style
bodyText: ref Style
inner(Template)

```

For class `Style`, we make explicit that generation of a `Style` object returns a reference to the newly generated object - this is not really needed since such a reference is returned by default. We also add `inner(Style)` and `inner(format)`.

```

class Style -> s: ref Style:
  format(content: var String, lineMax: var integer)
    -> formattedString: var String:<
    inner(format)
  inner(Style)
  s := this(Style)

```

The following example describes the classes `DefaultHeading` and `DefaultBodyText`:

```

class DefaultHeading: Style
  secNo: var integer
  format:<<
    secNo := secNo + 1
    formattedString := "\n" + secNo + ". " + content
class DefaultBodyText: Style
  format:<<
    pos: var integer
    pos := 3
    formattedString := "\n  "
    for (1):to(content.length):repeat
      pos := pos + 1
      if (pos > lineMax):then
        formattedString := formattedString + "\n  "
        pos := 3
    formattedString := formattedString + content.get[inx]

```

A `DefaultHeading` has a local variable `secNo` keeping track of the heading numbers. The `format` method increments `secNo` by one and returns a `String` consisting of a newline ("`\n`"), followed by `secNo` followed by a dot and a blank ("`.` ") and the string hold in the `content` parameter of `format`.

The `format` method of class `DefaultBodyText` appends the characters in `content` to `formattedContent`. A newline and three blanks ("`\n` ") are inserted so each line has a maximum of `lineMax` characters.

We define a standard template as a subclass of `Template`:

```

class StandardTemplate: Template
  heading := DefaultHeading
  bodyText:= DefaultBodyText

```

A `StandardTemplate` object initializes the predefined styles `heading` and `bodyText` to `defaultHeading` and `defaultBodyText` respectively.

Finally we define class `StandardDocument`:

```
class StandardDocument: Document
    addHeading(h: ref String):
        addParagraph(h, theTemplate.heading)
    addBodyText(b: ref String):
        addParagraph(b, theTemplate.bodyText)
```

Class StandardDocument is a subclass of Document. It adds two methods addHeading and addBodyText. Each invoke addParagraph with their String parameter and the appropriate style defined within theTemplate.

This completes describing the details of the simple text formatting system.