10.3.1 Details of the simple text formatter

Description

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:<
```


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```
      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 there 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.

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