

# 6.005 Project 1 Design

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## Grammar (adapted from EBNF):

Abc-tune ::= Abc-header Abc-music

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Abc-header ::= Field-index-number Comment\* Field-title Other-fields\* Field-key

Field-index-number ::= "X:" digit+ End-of-line

Field-title ::= "T:" text end-of-line

Other-fields ::= Field-composer | Field-default-length | Field-meter  
| Field-tempo | Field-voice | Comment

Field-composer ::= "C:" text End-of-line

Field-default-length ::= "L:" Note-length-strict End-of-line

Field-meter ::= "M:" Meter End-of-line

Field-tempo ::= "Q:" Tempo End-of-line

Field-voice ::= "V:" text End-of-line

Field-key ::= "K:" Key End-of-line

Key ::= Keynote minor?

Keynote ::= Basenote Key-accidental?

Key-accidental ::= "#" | "b"

minor ::= "m"

Meter ::= "C" | "C|" | Meter-fraction

Meter-fraction ::= digit+ "/" digit+

Tempo ::= digit+

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Abc-music ::= Abc-line+

Abc-line ::= (Element+ linefeed) | Mid-tune-field | Comment

Element ::= Note-element | Tuplet-element | Barline | Nth-repeat | space

Note-element ::= (Note | Chord)

**// note is either a pitch or a rest**

Note ::= Note-or-rest Note-length?

Note-or-rest ::= Pitch | Rest

Pitch ::= Accidental? Basenote Octave?

Octave ::= ("""+) | (" , "+)

Note-length ::= (digit+)? ("/" (digit+)?)?

Note-length-strict ::= digit+ "/" digit+

; "^" is sharp, "\_" is flat, and "=" is neutral

Accidental ::= "^" | ^^ | "\_" | \_\_ | "="

Basenote ::= "C" | "D" | "E" | "F" | "G" | "A" | "B"  
| "c" | "d" | "e" | "f" | "g" | "a" | "b"

Rest ::= "z"

### // Tuplets

Tuplet-element ::= Tuplet-spec

Tuplet-spec ::= "(" Tuplet-set

**;We will only allow duplets, triplets and quadruplets**

Tuplet-set::= ("2" Note-element Note-element) | ("3" Note-element Note-element Note-element) | ("4"  
Note-element Note-element Note-element Note-element)

### // Chords

Chord ::= "[" note+ "]"

Barline ::= "|" | "||" | "[|" | "|]" | ":|" | "|:"

Nth-repeat ::= "[1" | "[2"

; A voice field might reappear in the middle of a piece

; to indicate the change of a voice

Mid-tune-field- ::= Field-voice

Comment ::= "%" text linefeed

End-of-line ::= Comment | linefeed

### // other terminals:

digit ::= [0-9]

text ::= [a-zA-Z]+

linefeed ::= "\n"

space ::= "\s"

## **Data Structure (with diagram on next page):**

```
ABCTune = ABCHeader(fields : <fieldName,fieldValue>)  
        + ABCMusic(firstVoice:VoiceLine, remainingVoices:ABCMusic)  
VoiceLine = Repeats(firstSection: Section, secondSection: Section)  
        +Section(firstMeasure: Measure, remainingMeasures: Section)  
Measure = Element  
        + Tuplet(number:digit, elements: Collection<Element>)  
        + Chord(elements: Collection<Element>)  
Element = Pitch(length, baseNote)  
        +Rest(length)
```

**Data Structure Diagram:**

