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Network Programming CA1 Design Notes

Need to display text time in Format of "it is twenty minutes past ten o'clock"
Need to connect with NTP Server also.

Program takes argument in 24hr time format: hh:mm:ss or hh:mm
If the seconds (ss) are not defined, they are set as 0

If there is no argument defined, the program requests the time from an NTP server, if the NTP server can't be reached after a certain amount of time, the local system time is used instead.

Program Flow:

If the user supplies a time:
Output the time to the console in english

If the user does not supply a time:
Request a time from an ntp server
If the ntp server does not reply within 10 seconds, use the machines local system time

Validate a users input using a regular expression
([01]?[0-9]|2[0-3]):([0-5][0-9])(:([0-5][0-9]))?
First group allows a range from 00 - 23
Second group allows a range from 00 - 59
Third optional nested group allows 00 - 59
The third group is nested to make extracting the time easier without having to perform string manipulation on the colon character by skipping group 3 and taking group 4 as the seconds instead.

Logic behind which English words to use:

Some Possibilities:

13:20	It is twenty minutes past one o'clock
14:15	It is a quarter past two o'clock
15:30	It is half past three o'clock
15:35	It is twenty-five minutes to four o'clock
16:45	It is a quarter to five o'clock
17:00	It is five o'clock
23:59	It is one minute to one o'clock (Note hour rolls over to next day, not thirteen o'clock)

Common Components:
It is [<minute> || <minutes> || <"a quarter">] [<tense> || <no tense>]
[<hour> || <hour + 1> || <1>] o'clock

Conditions on the minute:
If the minute is 0 then:
It is [<hour>] o'clock

if the minute is equal to 15:
It is [<"a quarter">] [<tense = PAST>] [<hour> || <hour-12>] o'clock

if the minute is equal to 30:
It is [<"half">] [<tense = PAST>] [<hour> || <hour-12>] o'clock

If the minute is greater than 0 and less than 31:
It is [<minute> || <minutes>] [<tense = PAST>] [<hour> || <hour-12>] o'clock

If the minute is equal to 45:
It is [<"a quarter">] [<tense = TO>] [<hour + 1> || <hour-12+1> || <"1">] o'clock

If the minute is greater than 30 and less than 60:
It is [<minute> || <minutes>] [<tense = TO>] [<hour + 1> || <hour-12+1> || <"1">] o'clock

Conditions on the hour:
If the tense is PAST or HOUR then the hour is:
[<hour> || <hour-12>]

If the tense is TO then the hour is:
[<hour + 1> || <hour-12+1> || <"1">]

If the tense is TO and the hour is 23:
[<"1">]

Note:
[<hour-12>] indicates a conversion from 24 hours to 12 hour word

Further:
Using a text file to store the key and values for the time words, they will be mapped into the program using a hashmap (e.g 1 = one, 12 = twelve). This will also include custom key and values such as 101 = a quarter, 102 = half etc
Detail how it will map the values and parse the strings

Possible Tests:

Check what is outputted for 00:05
Test without text file in correct folder, handle errors and console message