IHLT 2017-2018 Final exam

Problem 1 (4 points)

Consider the derivation of English adjectives. Here are some examples:

big, bigger biggest
happy, happier, happiest, happily, unhappy, unhappier, unhappiest, unhappily
clear, clearer, clearest, clearly, unclear, unclearly

Answer the following:

1.Write a finite state automata (FSA) to support the hypothesis that the adjectives in English can have an optional prefix (**-un**), an obligatory root (**big, happy, clear**) and an optional suffix (**-er,-est** or **-ly**).

2. Does the FSA you wrote recognize ungrammatical forms like **unbig** or **bigly**? Explain your answer and in case the answer is yes, give a possible solution to this problem.

3. How orthographic rules to correct spelling changes, such as consonant doubling (big/bigger) will be incorporated.

Problem 2 (4 points)

Consider the following temporal expressions refering to times within a day:

At 12 am
At 12 h night
Between 12 and quarter past 12
At 15h 30m

1. Propose a representation formalism for time intervals like the ones in these examples.
2. Using the Context Free Grammar (CFG) formalism write a simple grammar to analyze temporal expressions like these.
3. Write a semantic grammar to analyze expressions like these and represent them according to the formalism you proposed in 1). To do this you could either extend your previous CFG grammar by inluding semantic features (converting it into a DCG grammar) **or** incorporate semantic information based on lambda calculus **or** use semantic category.

Problem 3(2 points)

An important bank is interested on building a call phone system for trying to reduce the human effort of answering the questions asked through phone by clients regarding the operative of the bank. The typical scenario is the following:

1.The call center receives a call from a client.
2.After identifying the language used by the client a dialog between the system and the client is carried out in order to trying to understand the question.
3.An attempt to answer the question is carried out.
4.If the system gets an answer it is transmitted to the client.
5.If the system is unable to get the answer, the system tries to locate the department of the bank most appropriate to continue the dialog and redirects the call to this department.
6.If the system is unable to assign the correct department the call is redirected to a human operator.
Answer the following questions:

1. Write the most important concepts involved in this scenario. Include also the attributes of those concepts and relationships between them.
2. You can consider all user interventions are transcribed to text. Discuss the NLP problems found in processing this kind of texts and the knowledge sources that could be used for facing them.