A Examples of Prediction

We show examples of predicted utterances by our NLG-LM model and its variant without language modeling task in Table 5. As shown, while the model without language modeling can often express required slot information, it typically generates several short sentences starting with "it is" or "its", making the response rigid. Also, it does not prefer to use conjunction words like humans to present multiple pieces of information in a single sentence with complex structure. Nevertheless, NLG-LM, while conveying MR information, tends to produce fewer yet longer sentences with sophisticated syntax structures via usage of conjunction words and attributive clauses. Furthermore, it sometimes blends in patterns learned from corpus that is not tied with slots, e.g. "kensington park hotel *is a nice place* where dogs are allowed". These patterns that are crucial to producing human-like responses are not focused on in MR-guided NLG but can be learned via training on language modeling task.

MR	name[The Cricketers], eatType[restaurant], food[Chinese], priceRange[high], customer rating[1 out of 5], area[riverside], familyFriendly[no], near[All Bar One]
Answer	The high priced Chinese restaurant The Cricketers, is based in the riverside area near to the All Bar One. It is not child friendly and has a customer rating of 1 out of 5.
w/o LM	The Cricketers is a restaurant providing Chinese food in the high price range. It is located in the riverside. It is near All Bar One. Its customer rating is 1 out of 5.
NLG-LM	The Cricketers is a Chinese restaurant in the riverside area near All Bar One. It is not children friendly and has a high price range and a customer rating of 1 out of 5.
MR	name[The Phoenix], eatType[restaurant], food[French], priceRange[cheap], area[riverside], familyFriendly[yes], near[Raja Indian Cuisine]
Answer	The Phoenix is a cheap family friendly French pub and a restaurant located near Raja Indian Cuisine near riverside
w/o LM	The Phoenix is a family friendly French restaurant near Raja Indian Cuisine in the riverside area. It has a cheap price range.
NLG-LM	The Phoenix is a cheap, family friendly French restaurant near Raja Indian Cuisine in the riverside area.
MR	inform, name[kensington park hotel], dogsallowed[yes]
Answer	kensington park hotel is a nice place where dogs are allowed
w/o LM	the kensington park hotel allows dogs
NLG-LM	kensington park hotel is a nice place where dogs are allowed
MR	inform, name[tecra pontus 52], type[laptop], weightrange[mid weight], isforbusinesscomputing[false], weight[2.49 kg]
Answer	tecra pontus 52 is a laptop which is in the mid weight weight range , is not for business computing , and weighs about 2.49 kg
w/o LM	tecra pontus 52 is a laptop that is not used for business computing . it weighs 2.49 kg and has a modest dimension
NLG-LM	tecra pontus 52 is a laptop which weighs about 2.49 kg , is not for business computing , and are in the mid weight weight range

Table 5: Example of predictions of NLG-LM model on E2E-NLG, Hotel and Laptop dataset. MR is the meaning representation prepended with dialogue act when there are multiple types of DAs. Answer is the human-generated response. w/o LM and NLG-LM indicate the system response generated by our model without and with language model task, respectively.