

Prompt Engineering

PROBLEM STATEMENT

Prompt Engineering

Compare different prompt engineering techniques such as zero-shot, one-shot, and few-shot prompting techniques using gpt-3.5 and gpt-4 models.



Zero Shot Prompting

Prompt

Answer the medical question delimited by triple backticks ``A 23-year-old pregnant woman at 22 weeks gestation presents with burning upon urination. She states it started 1 day ago and has been worsening despite drinking more water and taking cranberry extract. She otherwise feels well and is followed by a doctor for her pregnancy. Her temperature is 97.7°F (36.5°C), blood pressure is 122/77 mmHg, pulse is 80/min, respirations are 19/min, and oxygen saturation is 98% on room air. Physical exam is notable for an absence of costovertebral angle tenderness and a gravid uterus. Which of the following is the best treatment for this patient?

- A.Ampicillin
- B.Ceftriaxone
- C.Ciprofloxacin
- D.Doxycycline
- E.Nitrofurantoin ``

Zero Shot Prompting

Response

gpt-3.5-turbo

Nitrofurantoin is the best treatment option for this patient with a urinary tract infection during pregnancy. Ciprofloxacin, Doxycycline, and Ceftriaxone are not recommended in pregnancy due to potential harmful effects on the fetus. Ampicillin may be used for urinary tract infections in pregnancy, but nitrofurantoin is preferred as the first-line treatment.

Response

gpt-4.0

The symptoms described in the question suggest that the 23-year-old pregnant woman has a urinary tract infection (UTI). During pregnancy, the treatment of UTIs must consider both the effectiveness of the antibiotic and its safety for the fetus.

In this case, the best treatment for this patient is:

E. Nitrofurantoin

Nitrofurantoin is commonly used for treating UTIs in pregnant women and is generally considered safe during pregnancy, especially in the second trimester. It is effective against the common pathogens that cause UTIs.

Here's a brief explanation about the other options:

- A. Ampicillin: While ampicillin can be used in pregnancy, it is less frequently chosen due to resistance patterns.
- B. Ceftriaxone: This is a third-generation cephalosporin often used for more severe infections and is generally administered parenterally, making it less convenient for uncomplicated UTIs.
- C. Ciprofloxacin: Fluoroquinolones like ciprofloxacin are not recommended during pregnancy due to potential adverse effects on the developing fetus.
- D. Doxycycline: Tetracyclines such as doxycycline are contraindicated in pregnancy because they can affect fetal bone and teeth development.

Therefore, Nitrofurantoin is the best choice in this case.

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Example:

Question 1 : A 3-month-old baby died suddenly at night while asleep. His mother noticed that he had died only after she awoke in the morning. No cause of death was determined based on the autopsy. Which of the following precautions could have prevented the death of the baby?

Options:

- A.Placing the infant in a supine position on a firm mattress while sleeping
- B.Routine postnatal electrocardiogram (ECG)
- C.Keeping the infant covered and maintaining a high room temperature
- D.Application of a device to maintain the sleeping position
- E.Avoiding pacifier use during sleep

Answer: Placing the infant in a supine position on a firm mattress while sleeping

One Shot Prompting

Response

gpt-3.5-turbo

E.Nitrofurantoin

Nitrofurantoin is safe to use in pregnancy and is commonly used to treat urinary tract infections in pregnant women. It is effective against the most common organisms causing UTIs and is a suitable choice for this patient. Other antibiotics like Ciprofloxacin, Doxycycline, and some others are not recommended in pregnancy due to potential risks to the developing fetus. Ampicillin and Ceftriaxone are alternatives but are less commonly used for UTIs compared to Nitrofurantoin in pregnancy.

Response

gpt-4.0

Given the clinical presentation and her pregnancy status, the patient is likely experiencing a urinary tract infection (UTI). When treating a UTI during pregnancy, it is crucial to avoid certain antibiotics like Ciprofloxacin and Doxycycline due to potential risks to the fetus.

Here's an analysis of the options:

- Ampicillin: While Ampicillin can be used during pregnancy, it is not typically the first choice for uncomplicated UTIs.
- Ceftriaxone: Generally used for more serious infections, such as pyelonephritis, rather than uncomplicated UTIs.
- Ciprofloxacin: Fluoroquinolones like Ciprofloxacin are not recommended during pregnancy due to potential risks to the fetus.
- Doxycycline: Tetracyclines such as Doxycycline are contraindicated in pregnancy as they can affect fetal development, particularly bone growth and tooth color.
- Nitrofurantoin: Nitrofurantoin is often used for treating uncomplicated UTIs in pregnant women and is considered safe, particularly before the late third trimester.

Given this information, the best treatment for this patient is:

E. Nitrofurantoin

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- D.Application of a device to maintain the sleeping position
- E.Avoiding pacifier use during sleep

Answer: Placing the infant in a supine position on a firm mattress while sleeping

Question 2: A mother brings her 3-week-old infant to the pediatrician's office because she is concerned about his feeding habits. He was born without complications and has not had any medical problems up until this time. However, for the past 4 days, he has been fussy, is regurgitating all of his feeds, and his vomit is yellow in color. On physical exam, the child's abdomen is minimally distended but no other abnormalities are appreciated. Which of the following embryologic errors could account for this presentation?

Options:

- A.Abnormal migration of ventral pancreatic bud
- B.Complete failure of proximal duodenum to recanalize
- C.Error in neural crest cell migration
- D.Abnormal hypertrophy of the pylorus
- E.Failure of lateral body folds to move ventrally and fuse in the midline

Answer: Abnormal migration of ventral pancreatic bud

Few Shot Prompting

Response

gpt-3.5-turbo

The best treatment for the pregnant woman with burning upon urination is option E. Nitrofurantoin. It is commonly used to treat urinary tract infections in pregnancy due to its safety profile and effectiveness in this population. It is important to confirm the diagnosis with a urine culture and sensitivity before starting treatment.

Response

gpt-4.0

question 3

A 23-year-old pregnant woman at 22 weeks gestation presents with burning upon urination. She states it started 1 day ago and has been worsening despite drinking more water and taking cranberry extract. She otherwise feels well and is followed by a doctor for her pregnancy. Her temperature is 97.7°F (36.5°C), blood pressure is 122/77 mmHg, pulse is 80/min, respirations are 19/min, and oxygen saturation is 98% on room air. Physical exam is notable for an absence of costovertebral angle tenderness and a gravid uterus. Which of the following is the best treatment for this patient?

options: A. Ampicillin B. Ceftriaxone C. Ciprofloxacin D. Doxycycline E. Nitrofurantoin

answer: Nitrofurantoin