Artificial Data

- **Query1** (11100) is there a skin conductance lower than -265

  $Answer(Any(d.value < -265 \wedge d.type == GSR))$

- **Query2** (10) click on the second hypo event.

  $$DoClick(e) \wedge Order(e, 2, Sequence(d, d.type == Hypo \wedge$$
  $$d.time == CurrentDay))$$

- **Query3** (1101) how many weeks he has 8 meals?

  $Answer(Count(x, Count(d, d.type == Meal \wedge d.date == x) == 8 \wedge x.type == Week))$

- **Click1** (20)

  $Click(e) \wedge e.type == BGL \wedge e.time == 6{:}38\text{pm}$

- **Query4** (12)

  $Click(e) \wedge e.type == Meal \wedge e.time == 10{:}54\text{am}$

- **Query5** (12) how low was the blood glucose level then?

  $$Answer(e.value) \wedge Lowest(e.value) \wedge Around(e.time, e(-1).time) \wedge$$
  $$e.type == BGL$$

- **Statement1** (01) the patient experienced 3 lows before a meal.

  $Count(d, Hypo(d) \land Before(d.time, d_1.time) \land d_1.type == Meal) == 3$

- **Query6** (1101) what month was that?

  $Answer(Month(CurrentDate))$

- **Click2** (20)

  $Click(e) \land e.type == HeartRate \land e.time == 2{:}07\text{am}$

- **Query7** (11110) How many times per day does she eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query8** (1101) how many days have zero sleeps?

  $$Answer(Count(x, Count(d, d.type == ReportedSleep \land d.date == x) == 0 \land \\ x.type == Date))$$

- **Query9** (112) when was the first time she changed her Infusion set?

  $Answer(e.date) \land Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Statement2** (01) if you look around 6 o'clock at night, basal rate goes down.

  $Behavior(e.value, Down) \land Around(e.time, 6pm) \land e.type == BasalRate$

- **Query10** (121) it seems that the patient has experienced a hypo in the morning.

  $e.type == HypoEvent \land e.time == Morning()$

- **Query11** (121) so how bad was that?

  $Answer(e(-1).value)$

- **Query12** (11111) how high is step count before midnight?

  $$Answer(e.value) \wedge Highest(e.value) \wedge Before(e.time, MidNight())$$
  $$\wedge \, e.type == StepCount$$

- **Statement3** (01) the patient experienced 2 lows before a hypo action.

  $$Count(d, Hypo(d) \wedge Before(d.time, d_1.time) \wedge d_1.type == HypoAction) == 2$$

- **Query13** (111111*) does she do something?

  $$Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$$

- **Statement4** (01) I can see basal rate goes extremely high in dusk.

  $$High(e.value) \wedge e.type == BasalRate \wedge e.time == Dusk()$$

- **Query14** (11111) how high was the heart rate after noon?

  $$Answer(e.value) \wedge Highest(e.value) \wedge After(e.time, Noon()) \wedge$$
  $$e.type == HeartRate$$

- **Query15** (1101) which day is that?

  $$Answer(Day(CurrentDate))$$

- **Query16** (11110) How many times a day does he eat something, generally?

  $$Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$$

- **Click3** (20)

  $Click(e) \land e.type == BGL \land e.time == 2\text{:}01\text{am}$

- **Query17** (121) I see that he experienced a hypo event in the evening.

  $e.type == HypoEvent \land e.time == Evening()$

- **Query18** (121) so how bad was it?

  $Answer(e(-1).value)$

- **Query19** (10) can you go to the next day please?

  $DoSetDate(CurrentDate + 1)$

- **Query20** (11110) How many times a day does she eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Statement5** (00) that looks like her next to last day.

  $Order(x, -2, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Query21** (1101) so what is the last week they also have wakeup event reported?

  $Answer(e.date) \land Order(e, -1, Sequence(d, d.type == Wakeup))$

- **Query22** (1100) is this her first month?

  $Answer(CurrentDay == x) \land Order(x, 1, Sequence(d, d.type == Month))$

- **Query23** (11110) How many times per day does she eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query24** (11100) are there any skin conductances lower than -399

  $Answer(Any(d.value < -399 \wedge d.type == GSR))$

- **Statement6** (01) she experienced 3 lows before a meal.

  $Count(d, Hypo(d) \wedge Before(d.time, d_1.time) \wedge d_1.type == Meal) == 3$

- **Query25** (11110) How many times a day does she eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Statement7** (01) the patient experienced 2 lows following a meal.

  $Count(d, Hypo(d) \wedge After(d.time, d_1.time) \wedge d_1.type == Meal) == 2$

- **Query26** (12) how low did he get during this evening?

  $$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
  $$e.time == Evening()$$

- **Query27** (12) the blood glucose you showed, it is a hypoglycemia?

  $Answer(Hypo(e(-1)))$

- **Query28** (12) What did she do when she went hypo?

  $Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$

- **Query29** (121) it seems that the patient experienced a hypo during the afternoon.

    $e.type == HypoEvent \wedge e.time == Afternoon()$

- **Query30** (121) so how low is that?

    $Answer(e(-1).value)$

- **Click4** (20)

    $Click(e) \wedge e.type == Exercise \wedge e.time == 7{:}56\text{pm}$

- **Query31** (11111) how low was the blood glucose level before dusk?

    $$Answer(e.value) \wedge Lowest(e.value) \wedge Before(e.time, Dusk()) \wedge$$
    $$e.type == BGL$$

- **Query32** (11110) How many times a day does the patient eat, generally?

    $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query33** (12)

    $Click(e) \wedge e.type == Bolus \wedge e.time == 8{:}55\text{am}$

- **Query34** (12) was this just one bolus?

    $Answer(Count(d, d.type == Bolus \wedge Around(d.time, e(-1).time)) == 1)$

- **Query35** (11101) is there a skin conductance reported this month?

    $Answer(Any(d.type == GSR \wedge d.time == Month(CurrentDate)))$

- **Statement8** (01) I see the basal rate went really low in midday.

  $Low(e.value) \land e.type == BasalRate \land e.time == MidDay()$

- **Query36** (111111*) what kind of meal did she eat?

  $Answer(e.food) \land Around(e.time, e(-1).time)$

- **Statement9** (00) this is her last week.

  $Order(x, -1, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$

- **Query37** (10) toggle so we can see the wakeup events.

  $DoToggle(On, Wakeup)$

- **Query38** (11110) How many times a day does she eat something, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Statement10** (01) apparently the patient experienced a hypo event during the night.

  $e.type == HypoEvent \land e.time == Night()$

- **Statement11** (01) around 3 o'clock at night, skin temperature went up.

  $Behavior(e.value, Up) \land Around(e.time, 3pm) \land e.type == SkinTemperature$

- **Query39** (121) apparently she has experienced a hypo in the morning.

  $e.type == HypoEvent \land e.time == Morning()$

- **Query40** (121) how bad is this hypo?

    $Answer(e(-1).value)$

- **Query41** (12)

    $Click(e) \wedge e.type == Bolus \wedge e.time == 9{:}38\text{am}$

- **Query42** (12) is that only one bolus?

    $Answer(Count(d, d.type == Bolus \wedge Around(d.time, e(-1).time)) == 1)$

- **Query43** (12)

    $Click(e) \wedge e.type == HypoEvent \wedge e.time == 11{:}45\text{am}$

- **Query44** (12) she says that she feels shakey.

- **Query45** (12) so what does she do?

    $Answer(e) \wedge e.type == HypoAction \wedge Around(e.time, e(-2).time)$

- **Query46** (11100) do we have some other day she went low in the morning and evening?

    $Answer(Any(Hypo(d_1) \wedge Hypo(d_2) \wedge x! = CurrentDate\wedge$
    $\quad x.type == Date \wedge d_1.time == Morning(x) \wedge d_2.time == Afternoon(x)))$

- **Statement12** (00) this is his next to last day.

    $Order(x, -2, Sequence(d, d.type == Day)) \wedge x == Day(CurrentDate)$

8

- **Click5** (20)

    $Click(e) \wedge e.type == Wakeup \wedge e.time == 9{:}32\text{am}$

- **Query47** (1100) is that patient 502?

    $Answer(CurrentPatient == 502)$

- **Statement13** (00) this looks like his last week.

    $Order(x, -1, Sequence(d, d.type == Week)) \wedge x == Week(CurrentDate)$

- **Query48** (11110) How many times per day does she eat, on average?

    $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query49** (121) apparently he has experienced a hypo event in the afternoon.

    $e.type == HypoEvent \wedge e.time == Afternoon()$

- **Query50** (121) how low was it?

    $Answer(e(-1).value)$

- **Query51** (1101) how many weeks have less than 7 wakeup events?

    $$Answer(Count(x, Count(d, d.type == Wakeup \wedge d.date == x) < 7 \wedge \\ x.type == Week))$$

- **Statement14** (01) if you look around 8 o'clock at night, skin conductance went up.

    $Behavior(e.value, Up) \wedge Around(e.time, 8pm) \wedge e.type == GSR$

9

- **Query52** (11110) How many times a day does the patient eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query53** (11100) did she always get some sleep around 5:00pm?

  $Answer(Cond(Around(x, 5:00pm) ==> Any(d.type == ReportedSleep \wedge d.time == x)))$

- **Statement15** (01) the patient experienced 3 lows following a fingerstick.

  $$Count(d, Hypo(d) \wedge After(d.time, d_1.time) \wedge$$
  $$d_1.type == FingerSticks) == 3$$

- **Query54** (11110) How many times per day does she eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Click6** (20)

  $Click(e) \wedge e.type == Exercise \wedge e.time == 5:44pm$

- **Query55** (11110) How many times a day does the patient eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query56** (11101) has the average skin conductance gone up since yesterday?

  $$Answer(Mean(d.value, d.type == GSR \wedge d.date == CurrentDate) > Mean(d.value,$$
  $$d.type == GSR \wedge d.date == CurrentDate - 1))$$

- **Query57** (1101) what is the third week they also have basal rate reported?

  $Answer(e.date) \wedge Order(e, 3, Sequence(d, d.type == BasalRate))$

- **Query58** (121) I see that he experienced a hypo event during the evening.

  $e.type == HypoEvent \wedge e.time == Evening()$

- **Query59** (121) so how bad was this hypo event?

  $Answer(e(-1).value)$

- **Query60** (10) so, go to Tuesday.

  $DoSetDate(Tuesday)$

- **Click7** (20)

  $Click(e) \wedge e.type == ReportedSleep \wedge e.time == 6\text{:}48\text{am}$

- **Query61** (1101) which day is that?

  $Answer(Day(CurrentDate))$

- **Query62** (11110) How many times per day does the patient eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query63** (11111) what was he doing midday when his step count went down?

  $Answer(e) \wedge Behavior(e_1.value, Down) \wedge Around(e.time, e_1.time)$
  $\wedge e_1.type == StepCount \wedge e_1.time == MidDay()$

- **Statement16** (01) I can see that basal rate goes extremely high in noon.

  $High(e.value) \wedge e.type == BasalRate \wedge e.time == Noon()$

11

- **Query64** (111111*) what kind of food did he eat?

  $Answer(e.food) \wedge Around(e.time, e(-1).time)$

- **Query65** (10) so, go to October 27.

  $DoSetDate(10 - 27 - 16)$

- **Query66** (10) let's go to Wednesday.

  $DoSetDate(Wednesday)$

- **Query67** (1100) is that their first week?

  $Answer(CurrentDay == x) \wedge Order(x, 1, Sequence(d, d.type == Week))$

- **Click8** (20)

  $Click(e) \wedge e.type == Exercise \wedge e.time == 7{:}00\text{pm}$

- **Query68** (1100) is that her third week?

  $Answer(CurrentDay == x) \wedge Order(x, 3, Sequence(d, d.type == Week))$

- **Query69** (10) toggle so we don't see the sweats.

  $DoToggle(Off, GSR)$

- **Query70** (12) let's turn the sweat off.

  $DoToggle(Off, GSR)$

- **Query71** (12) and the heart rate too

  $DoToggle(Off, HeartRate)$

- **Query72** (12)

  $Click(e) \wedge e.type == HypoEvent \wedge e.time == 11{:}45\text{am}$

- **Query73** (12) she says that she feels shakey.

- **Query74** (12) so what action does she take?

  $Answer(e) \wedge e.type == HypoAction \wedge Around(e.time, e(-2).time)$

- **Query75** (11111) how low is the BGL before midday?

  $$Answer(e.value) \wedge Lowest(e.value) \wedge Before(e.time, MidDay()) \wedge$$
  $$e.type == BGL$$

- **Query76** (11111) how high does she go during that afternoon?

  $$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
  $$e.time == Afternoon()$$

- **Query77** (112) when was the first time she changed her Infusion set?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query78** (1100) is this their first day?

  $Answer(CurrentDay == x) \wedge Order(x, 1, Sequence(d, d.type == Day))$

- **Query79** (112) when was the first time she changed her Infusion set?

  $Answer(e.date) \land Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query80** (1101) how many days she has multiple exercises?

  $Answer(Count(x, Count(d, d.type == Exercise \land d.date == x) > 1 \land$
  $$x.type == Date))$$

- **Query81** (1100) is that patient 563?

  $Answer(CurrentPatient == 563)$

- **Query82** (11100) did she always get some rest around 6:48am?

  $Answer(Cond(Around(x, 6 : 48am) ==> Any(d.type == ReportedSleep \land d.time == x)))$

- **Query83** (11111) now what was he doing during the afternoon when his skin conductance went down?

  $Answer(e) \land Behavior(e_1.value, Down) \land Around(e.time, e_1.time)$
  $$\land e_1.type == GSR \land e_1.time == Afternoon()$$

- **Query84** (11100) are there any skin conductances that are lower than -260

  $Answer(Any(d.value < -260 \land d.type == GSR))$

- **Query85** (1100) are we on patient 505?

  $Answer(CurrentPatient == 505)$

- **Query86** (11111) how high was step count before dusk?

  $Answer(e.value) \land Highest(e.value) \land Before(e.time, Dusk()) \land$
  $$e.type == StepCount$$

- **Query87** (112)   when was the last time she changed her Infusion set?

$$Answer(e.date) \wedge Order(e, -1, Sequence(d, d.type == InfusionSet \wedge$$
$$d.time == Before(CurrentDay)))$$

- **Query88** (1101)   how many days have less than 2 sleeps?

$$Answer(Count(x, Count(d, d.type == ReportedSleep \wedge d.date == x) < 2 \wedge$$
$$x.type == Date))$$

- **Query89** (12)

$$Click(e) \wedge e.type == HypoEvent \wedge e.time == 11{:}45am$$

- **Query90** (12)   she says she feels shakey.

- **Query91** (12)   so what does she do about it?

$$Answer(e) \wedge e.type == HypoAction \wedge Around(e.time, e(-2).time)$$

- **Query92** (1100)   is it the last day of the patient?

$$Answer(Day(CurrentDate) == x) \wedge Order(x, -1, Sequence(d, d.type == Day))$$

- **Query93** (10)   to the day before please.

$$DoSetDate(CurrentDate - 1)$$

- **Query94** (11111)   how low was BGL before working?

$$Answer(e.value) \wedge Lowest(e.value) \wedge Before(e.time, e_1.time) \wedge$$
$$e.type == BGL \wedge e_1.type == Work$$

- **Query95** (1100) is it the next to last day of the patient?

  $Answer(Day(CurrentDate) == x) \wedge Order(x, -2, Sequence(d, d.type == Day))$

- **Query96** (11100) is there any sweat more than 384

  $Answer(Any(d.value > 384 \wedge d.type == GSR))$

- **Statement17** (01) the patient had 2 lows following a hypo event.

  $Count(d, Hypo(d) \wedge After(d.time, d_1.time) \wedge d_1.type == Hypo) == 2$

- **Query97** (1101) what year was it?

  $Answer(Year(CurrentDate))$

- **Query98** (112) when was the last time he changed his Infusion set?

  $Answer(e.date) \wedge Order(e, -1, Sequence(d, d.type == InfusionSet \wedge$
  $d.time == Before(CurrentDay)))$

- **Query99** (1101) what is the third day we have sweat reported?

  $Answer(e.date) \wedge Order(e, 3, Sequence(d, d.type == GSR))$

- **Query100** (10) click on next to last stressor.

  $DoClick(e) \wedge Order(e, -2, Sequence(d, d.type == Stressors \wedge$
  $d.time == CurrentDay))$

- **Query101** (11111) let's see the comments.

  $Answer(e) \wedge e.type == Misc$

- **Click9** (20)

  $Click(e) \land e.type == Work \land e.time == 10{:}49\text{pm}$

- **Query102** (11101) is there a wakeup event reported today?

  $Answer(Any(d.type == Wakeup \land d.date == CurrentDate))$

- **Statement18** (01) if you look around 6 o'clock during the day, sweat went down.

  $Behavior(e.value, Down) \land Around(e.time, 6am) \land e.type == GSR$

- **Statement19** (00) that looks like her first day.

  $Order(x, 1, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Click10** (20)

  $Click(e) \land e.type == Work \land e.time == 11{:}50\text{pm}$

- **Query103** (10) do the toggle so we don't see the blood glucose levels.

  $DoToggle(Off, BGL)$

- **Query104** (112) when was the first time he changed his Infusion set?

  $Answer(e.date) \land Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query105** (11111) how high was the sweat before sleep?

  $$Answer(e.value) \land Highest(e.value) \land Before(e.time, e_1.time) \land$$
  $$e.type == GSR \land e_1.type == ReportedSleep$$

- **Query106** (10) back to the previous day.

  $DoSetDate(CurrentDate - 1)$

- **Statement20** (00) this looks like his third day.

  $Order(x, 3, Sequence(d, d.type == Day)) \wedge x == Day(CurrentDate)$

- **Query107** (10) we can turn off skin and air temperature.

  $DoToggle(Off, SkinTemperature) \wedge DoToggle(Off, AirTemperature)$

- **Query108** (12)

  $Click(e) \wedge e.type == Bolus \wedge e.time == 3{:}18\text{pm}$

- **Query109** (12) was this only one bolus?

  $Answer(Count(d, d.type == Bolus \wedge Around(d.time, e(-1).time)) == 1)$

- **Query110** (11101) has the average sweat come down since yesterday?

  $Answer(Mean(d.value, d.type == GSR \wedge d.date == CurrentDate) < Mean(d.value,$
  $d.type == GSR \wedge d.date == CurrentDate - 1))$

- **Statement21** (01) I see that the blood glucose level went noticeably high in noon.

  $High(e.value) \wedge e.type == BGL \wedge e.time == Noon()$

- **Query111** (11111) how high was heart rate before working?

  $Answer(e.value) \wedge Highest(e.value) \wedge Before(e.time, e_1.time) \wedge$
  $e.type == HeartRate \wedge e_1.type == Work$

- **Query112** (11110) How many times a day does she eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Statement22** (01) I can see the BGL went pretty high at midday.

  $High(e.value) \land e.type == BGL \land e.time == MidDay()$

- **Query113** (11100) does she ever go to bed around 2:44am?

  $Answer(Any(d.type == ReportedSleep \land Around(d.time, 2:44am)))$

- **Statement23** (00) this looks like her last month.

  $Order(x, -1, Sequence(d, d.type == Month)) \land x == Month(CurrentDate)$

- **Statement24** (00) that looks like her second day.

  $Order(x, 2, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Click11** (20)

  $Click(e) \land e.type == BasalRate \land e.time == 4{:}14\text{am}$

- **Query114** (11100) does he ever go to bed around 11:19am?

  $Answer(Any(d.type == ReportedSleep \land Around(d.time, 11:19am)))$

- **Query115** (11101) Did she eat during morning?

  $Answer(Any(d.type == Meal \land d.time == Morning))$

- **Query116** (1100) is it her last month?

$$Answer(CurrentDay == x) \wedge Order(x, -1, Sequence(d, d.type == Month))$$

- **Query117** (11111) how high does he go this evening?

$$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
$$e.time == Evening()$$

- **Statement25** (01) she had 2 lows after a meal.

$$Count(d, Hypo(d) \wedge After(d.time, d_1.time) \wedge d_1.type == Meal) == 2$$

- **Query118** (12)

$$Click(e) \wedge e.type == Meal \wedge e.time == 5{:}13\text{pm}$$

- **Query119** (12) how low was heart rate then?

$$Answer(e.value) \wedge Lowest(e.value) \wedge Around(e.time, e(-1).time) \wedge$$
$$e.type == HeartRate$$

- **Query120** (12)

$$Click(e) \wedge e.type == Meal \wedge e.time == 5{:}36\text{am}$$

- **Query121** (12) how low was skin conductance?

$$Answer(e.value) \wedge Lowest(e.value) \wedge Around(e.time, e(-1).time) \wedge$$
$$e.type == GSR$$

- **Query122** (1101) so what is the last week we also have skin temperature reported?

$$Answer(e.date) \wedge Order(e, -1, Sequence(d, d.type == SkinTemperature))$$

- **Click12** (20)

  $Click(e) \land e.type == BGL \land e.time == 7{:}47\text{pm}$

- **Query123** (11101) has the average skin temperature come down compared to yesterday?

  $Answer(Mean(d.value, d.type == SkinTemperature \land d.date == CurrentDate) <$
  $Mean(d.value, d.type == SkinTemperature \land d.date == CurrentDate - 1))$

- **Click13** (20)

  $Click(e) \land e.type == HypoAction \land e.time == 5{:}46\text{am}$

- **Query124** (11101) is there any meal reported today?

  $Answer(Any(d.type == Meal \land d.date == CurrentDate))$

- **Query125** (12)

  $Click(e) \land e.type == Meal \land e.time == 1{:}57\text{pm}$

- **Query126** (12) how low was skin temperature at the time that the patient ate?

  $Answer(e.value) \land Lowest(e.value) \land Around(e.time, e(-1).time) \land$
  $e.type == SkinTemperature$

- **Click14** (20)

  $Click(e) \land e.type == Bolus \land e.time == 8{:}44\text{pm}$

- **Query127** (11100) is there a sweat that is higher than -133

  $Answer(Any(d.value > -133 \land d.type == GSR))$

- **Query128** (11111) now what was she doing during the morning when her step count went up?

$$Answer(e) \land Behavior(e_1.value, Up) \land Around(e.time, e_1.time) \land$$
$$e_1.type == StepCount \land e_1.time == Morning()$$

- **Query129** (121) I see that he has experienced a hypo event in the afternoon.

$$e.type == HypoEvent \land e.time == Afternoon()$$

- **Query130** (121) how bad is it?

$$Answer(e(-1).value)$$

- **Query131** (1100) is this his first week?

$$Answer(CurrentDay == x) \land Order(x, 1, Sequence(d, d.type == Week))$$

- **Query132** (11110) How many times per day does the patient eat something, generally?

$$Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$$

- **Statement26** (01) around 5 o'clock at night, BGL went up.

$$Behavior(e.value, Up) \land Around(e.time, 5pm) \land e.type == BGL$$

- **Query133** (111111*) what did he eat?

$$Answer(e.food) \land Around(e.time, e(-1).time)$$

- **Query134** (10) click the next to last miscellaneous event.

$$DoClick(e) \land Order(e, -2, Sequence(d, d.type == Misc \land$$
$$d.time == CurrentDay))$$

- **Query135** (1101) how many days he has less than 7 illnesss?

$$Answer(Count(x, Count(d, d.type == Illnesses \land d.date == x) < 7 \land$$
$$x.type == Date))$$

- **Statement27** (00) this looks like his third week.

$$Order(x, 3, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$$

- **Query136** (12)

$$Click(e) \land e.type == HypoEvent \land e.time == 11\text{:}45am$$

- **Query137** (12) she says she feels shakey.

- **Query138** (12) so what does she do about it?

$$Answer(e) \land e.type == HypoAction \land Around(e.time, e(-2).time)$$

- **Statement28** (01) if you look around 10 o'clock during the day, BGL went down.

$$Behavior(e.value, Down) \land Around(e.time, 10am) \land e.type == BGL$$

- **Query139** (1101) what is the last day we also have wakeup event reported?

$$Answer(e.date) \land Order(e, -1, Sequence(d, d.type == Wakeup))$$

- **Query140** (1100) is that patient 502?

$$Answer(CurrentPatient == 502)$$

- **Query141** (11101) is there a basal rate reported today?

  $Answer(Any(d.type == BasalRate \wedge d.date == CurrentDate))$

- **Click15** (20)

  $Click(e) \wedge e.type == Misc \wedge e.time == 2{:}48\text{pm}$

- **Click16** (20)

  $Click(e) \wedge e.type == GSR \wedge e.time == 3{:}31\text{am}$

- **Click17** (20)

  $Click(e) \wedge e.type == Work \wedge e.time == 7{:}25\text{am}$

- **Query142** (11110) How many times per day does the patient eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query143** (10) could you please turn the work off?

  $DoToggle(Off, Work)$

- **Query144** (121) apparently he experienced a hypo event during the morning.

  $e.type == HypoEvent \wedge e.time == Morning()$

- **Query145** (121) so how low was that hypo?

  $Answer(e(-1).value)$

- **Query146** (11100) does he always get some rest around 4:14pm?

  $Answer(Cond(Around(x, 4 : 14pm) ==> Any(d.type == ReportedSleep \land d.time == x)))$

- **Query147** (10) move ahead to January 6.

  $DoSetDate(1 - 6 - 16)$

- **Query148** (1100) are we on patient 559?

  $Answer(CurrentPatient == 559)$

- **Click18** (20)

  $Click(e) \land e.type == ReportedSleep \land e.time == 1:03\text{pm}$

- **Query149** (11101) is there a exercise reported this day?

  $Answer(Any(d.type == Exercise \land d.date == CurrentDate))$

- **Statement29** (00) that is his last month.

  $Order(x, -1, Sequence(d, d.type == Month)) \land x == Month(CurrentDate)$

- **Statement30** (01) I see that the patient experienced a hypo during the night.

  $e.type == HypoEvent \land e.time == Night()$

- **Click19** (20)

  $Click(e) \land e.type == HeartRate \land e.time == 4:34\text{am}$

- **Query150** (1101) what year was it?

  $Answer(Year(CurrentDate))$

- **Query151** (11100) does he always sleep around 8:25pm?

  $Answer(Cond(Around(x, 8:25pm) ==> Any(d.type == ReportedSleep \land d.time == x)))$

- **Statement31** (01) apparently he experienced a hypo event in the afternoon.

  $e.type == HypoEvent \land e.time == Afternoon()$

- **Query152** (1101) so what is the second month they have step count reported?

  $Answer(e.date) \land Order(e, 2, Sequence(d, d.type == StepCount))$

- **Query153** (11110) How many times per day does he eat something, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query154** (11111) how low is basal rate before dawn?

  $$Answer(e.value) \land Lowest(e.value) \land Before(e.time, Dawn()) \land$$
  $$e.type == BasalRate$$

- **Query155** (121) it seems that she has experienced a hypo in the afternoon.

  $e.type == HypoEvent \land e.time == Afternoon()$

- **Query156** (121) how bad was it?

  $Answer(e(-1).value)$

- **Query157** (11111) how high does she go this afternoon?

  $$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
  $$e.time == Afternoon()$$

- **Query158** (1101) what week was this?

  $$Answer(Week(CurrentDate))$$

- **Click20** (20)

  $$Click(e) \wedge e.type == HypoAction \wedge e.time == 10{:}36\text{pm}$$

- **Query159** (1100) is it his third month?

  $$Answer(CurrentDay == x) \wedge Order(x, 3, Sequence(d, d.type == Month))$$

- **Query160** (11101) is there any work reported this day?

  $$Answer(Any(d.type == Work \wedge d.date == CurrentDate))$$

- **Query161** (121) it seems that the patient has experienced a hypo in the evening.

  $$e.type == HypoEvent \wedge e.time == Evening()$$

- **Query162** (121) how bad was this hypo?

  $$Answer(e(-1).value)$$

- **Query163** (11100) are there any blood glucose levels lower than -189

  $$Answer(Any(d.value < -189 \wedge d.type == BGL))$$

- **Query164** (11110) How many times a day does the patient eat something, on average?

$$Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$$

- **Query165** (11101) Did she eat during the morning?

$$Answer(Any(d.type == Meal \land d.time == Morning))$$

- **Click21** (20)

$$Click(e) \land e.type == BasalRate \land e.time == 8{:}35\text{am}$$

- **Query166** (11111) what is he doing midday when his basal rate goes up?

$$Answer(e) \land Behavior(e_1.value, Up) \land Around(e.time, e_1.time) \land$$
$$e_1.type == BasalRate \land e_1.time == MidDay()$$

- **Statement32** (01) if you look around 4 o'clock during the day, sweat went up.

$$Behavior(e.value, Up) \land Around(e.time, 4am) \land e.type == GSR$$

- **Query167** (11100) do we have some other day she goes low in the morning and evening?

$$Answer(Any(Hypo(d_1) \land Hypo(d_2) \land x! = CurrentDate \land$$
$$x.type == Date \land d_1.time == Morning(x) \land d_2.time == Afternoon(x)))$$

- **Query168** (11101) is there a BGL reported today?

$$Answer(Any(d.type == BGL \land d.date == CurrentDate))$$

- **Query169** (10) to the day before.

  $DoSetDate(CurrentDate - 1)$

- **Query170** (10) go to Monday.

  $DoSetDate(Monday)$

- **Query171** (11111) how high is the heart rate after bolusing?

  $$Answer(e.value) \wedge Highest(e.value) \wedge After(e.time, e_1.time) \wedge$$
  $$e.type == HeartRate \wedge e_1.type == Bolus$$

- **Query172** (11111) how high was the blood glucose level after noon?

  $$Answer(e.value) \wedge Highest(e.value) \wedge After(e.time, Noon()) \wedge$$
  $$e.type == BGL$$

- **Query173** (11101) Did he eat during the afternoon?

  $$Answer(Any(d.type == Meal \wedge d.time == Afternoon))$$

- **Query174** (11110) How many times per day does he eat something, generally?

  $$Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$$

- **Query175** (121) apparently the patient experienced a hypo during the afternoon.

  $$e.type == HypoEvent \wedge e.time == Afternoon()$$

- **Query176** (121) so how bad was that?

  $$Answer(e(-1).value)$$

- **Query177** (1101) how many months have 3 stressors?

$$Answer(Count(x, Count(d, d.type == Stressors \land d.date == x) == 3 \land$$
$$x.type == Month))$$

- **Query178** (11110) How many times a day does she eat, on average?

$$Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$$

- **Query179** (11101) is there a BGL reported that month?

$$Answer(Any(d.type == BGL \land d.time == Month(CurrentDate)))$$

- **Query180** (112) when is the third time she changes her Infusion set?

$$Answer(e.date) \land Order(e, 3, Sequence(d, d.type == InfusionSet))$$

- **Query181** (12)

$$Click(e) \land e.type == Bolus \land e.time == 5:12am$$

- **Query182** (12) was that just one bolus?

$$Answer(Count(d, d.type == Bolus \land Around(d.time, e(-1).time)) == 1)$$

- **Query183** (1100) are we on patient 504?

$$Answer(CurrentPatient == 504)$$

- **Query184** (1101) what is the third week they have illness reported?

$$Answer(e.date) \land Order(e, 3, Sequence(d, d.type == Illnesses))$$

- **Query185** (10) can you go to the next day?

  $DoSetDate(CurrentDate + 1)$

- **Statement33** (01) if you look around 8 o'clock during the day, basal rate went up.

  $Behavior(e.value, Up) \wedge Around(e.time, 8am) \wedge e.type == BasalRate$

- **Query186** (111111*) what did she eat?

  $Answer(e.food) \wedge Around(e.time, e(-1).time)$

- **Query187** (1101) so what is the first week we also have sleep reported?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == ReportedSleep))$

- **Query188** (1101) how many days she has multiple fingersticks?

  $Answer(Count(x, Count(d, d.type == FingerSticks \wedge d.date == x) > 1 \wedge$
  $x.type == Date))$

- **Query189** (11110) How many times per day does the patient eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query190** (1100) is this his second month?

  $Answer(CurrentDay == x) \wedge Order(x, 2, Sequence(d, d.type == Month))$

- **Statement34** (00) this looks like her second month.

  $Order(x, 2, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$

31

- **Query191** (1100) is that his third day?

  $Answer(CurrentDay == x) \land Order(x, 3, Sequence(d, d.type == Day))$

- **Query192** (12)

  $Click(e) \land e.type == Bolus \land e.time == 3{:}43\text{am}$

- **Query193** (12) is that just one bolus?

  $Answer(Count(d, d.type == Bolus \land Around(d.time, e(-1).time)) == 1)$

- **Query194** (10) toggle so we can see wakeup events.

  $DoToggle(On, Wakeup)$

- **Query195** (112) when was the first time she changed her Infusion set?

  $Answer(e.date) \land Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query196** (1100) are we on patient 559?

  $Answer(CurrentPatient == 559)$

- **Query197** (112) when is the next to last time she changes her Infusion set?

  $Answer(e.date) \land Order(e, -2, Sequence(d, d.type == InfusionSet))$

- **Query198** (121) apparently the patient experienced a hypo event in the morning.

  $e.type == HypoEvent \land e.time == Morning()$

- **Query199** (121) so how bad is it?

  $Answer(e(-1).value)$

- **Statement35** (00) this is her second month.

  $Order(x, 2, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$

- **Query200** (12) how low did he go that morning?

  $Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$
  $$e.time == Morning()$$

- **Query201** (12) the blood glucose you showed, is it a hypoglycemia?

  $Answer(Hypo(e(-1)))$

- **Query202** (12) What did she do then?

  $Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$

- **Query203** (112) when was the last time she changed her Infusion set?

  $Answer(e.date) \wedge Order(e, -1, Sequence(d, d.type == InfusionSet \wedge$
  $$d.time == Before(CurrentDay)))$$

- **Query204** (10) so, let's move ahead to August 3.

  $DoSetDate(8 - 3 - 16)$

- **Click22** (20)

  $Click(e) \wedge e.type == Illnesses \wedge e.time == 8{:}10\text{pm}$

- **Query205** (12) we should turn the illness off.

  $DoToggle(Off, Illnesses)$

- **Query206** (12) and the blood glucose level too

  $DoToggle(Off, BGL)$

- **Query207** (1100) is it her third day?

  $Answer(CurrentDay == x) \wedge Order(x, 3, Sequence(d, d.type == Day))$

- **Query208** (12)

  $Click(e) \wedge e.type == Bolus \wedge e.time == 10:34\text{pm}$

- **Query209** (12) was this just one bolus?

  $Answer(Count(d, d.type == Bolus \wedge Around(d.time, e(-1).time)) == 1)$

- **Query210** (121) apparently the patient experienced a hypo during the evening.

  $e.type == HypoEvent \wedge e.time == Evening()$

- **Query211** (121) so how low is this hypo event?

  $Answer(e(-1).value)$

- **Query212** (121) it seems that she has experienced a hypo in the evening.

  $e.type == HypoEvent \wedge e.time == Evening()$

- **Query213** (121) so how low is it?

  $Answer(e(-1).value)$

- **Query214** (11110) How many times a day does the patient eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query215** (11100) is there any heart rate higher than -196

  $Answer(Any(d.value > -196 \wedge d.type == HeartRate))$

- **Query216** (112) when was the last time she changed her Infusion set?

  $$Answer(e.date) \wedge Order(e, -1, Sequence(d, d.type == InfusionSet \wedge$$
  $$d.time == Before(CurrentDay)))$$

- **Query217** (1100) is that patient 559?

  $Answer(CurrentPatient == 559)$

- **Query218** (12)

  $Click(e) \wedge e.type == HypoEvent \wedge e.time == 11:45am$

- **Query219** (12) she says she feels shakey.

- **Query220** (12) so what action does she take?

  $Answer(e) \wedge e.type == HypoAction \wedge Around(e.time, e(-2).time)$

- **Query221** (11100) does she always get some sleep around 1:52pm?

  $Answer(Cond(Around(x, 1:52pm) ==> Any(d.type == ReportedSleep \land d.time == x)))$

- **Query222** (10) can you go to the previous day please?

  $DoSetDate(CurrentDate - 1)$

- **Query223** (11110) How many times per day does she eat something, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Click23** (20)

  $Click(e) \land e.type == Hypo \land e.time == 2:38pm$

- **Statement36** (01) in the afternoon, she goes low.

  $Hypo(e) \land e.time == Afternoon()$

- **Query224** (11101) is there a heart rate reported this week?

  $Answer(Any(d.type == HeartRate \land d.time == Week(CurrentDate)))$

- **Query225** (10) go to March 12.

  $DoSetDate(3 - 12 - 16)$

- **Statement37** (00) this is her next to last month.

  $Order(x, -2, Sequence(d, d.type == Month)) \land x == Month(CurrentDate)$

- **Query226** (11110) How many times per day does he eat something, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query227** (1101) so what is the second day they also have work reported?

  $Answer(e.date) \land Order(e, 2, Sequence(d, d.type == Work))$

- **Statement38** (01) the patient had 2 lows before a meal.

  $Count(d, Hypo(d) \land Before(d.time, d_1.time) \land d_1.type == Meal) == 2$

- **Query228** (11111) how high does she go during this evening?

  $$Answer(e.value) \land Lowest(e.value) \land e.type == BGL\land$$
  $$e.time == Evening()$$

- **Statement39** (00) that looks like her next to last week.

  $Order(x, -2, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$

- **Query229** (10) toggle so we don't see the wakeup events.

  $DoToggle(Off, Wakeup)$

- **Statement40** (00) that is his first day.

  $Order(x, 1, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Statement41** (00) that seems to be her last month.

  $Order(x, -1, Sequence(d, d.type == Month)) \land x == Month(CurrentDate)$

- **Statement42** (00)   that seems to be her second month.

  $Order(x, 2, Sequence(d, d.type == Month)) \land x == Month(CurrentDate)$

- **Query230** (11101)   is there a bolus reported that day?

  $Answer(Any(d.type == Bolus \land d.date == CurrentDate))$

- **Query231** (1101)   which week was this?

  $Answer(Week(CurrentDate))$

- **Statement43** (01)   during the night, he goes low.

  $Hypo(e) \land e.time == Night()$

- **Query232** (111111^*) does he do anything at all?

  $Answer(e) \land Around(e.time, e(-1).time) \land e.type == DiscreteType$

- **Statement44** (00)   that looks like her second month.

  $Order(x, 2, Sequence(d, d.type == Month)) \land x == Month(CurrentDate)$

- **Click24** (20)

  $Click(e) \land e.type == HypoAction \land e.time == 4\text{:}00\text{pm}$

- **Query233** (11110)   How many times a day does he eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query234** (12)

  $Click(e) \wedge e.type == Meal \wedge e.time == 5{:}08\text{pm}$

- **Query235** (12) how low was the step count at the time that he ate?

  $$Answer(e.value) \wedge Lowest(e.value) \wedge Around(e.time, e(-1).time) \wedge$$
  $$e.type == StepCount$$

- **Query236** (12) how low did she get this morning?

  $$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
  $$e.time == Morning()$$

- **Query237** (12) the blood glucose you showed, it is hypoglycemia?

  $Answer(Hypo(e(-1)))$

- **Query238** (12) What did she do when she went hypo?

  $Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$

- **Query239** (112) when is the third time he changes his Infusion set?

  $Answer(e.date) \wedge Order(e, 3, Sequence(d, d.type == InfusionSet))$

- **Query240** (121) I see that she experienced a hypo in the morning.

  $e.type == HypoEvent \wedge e.time == Morning()$

- **Query241** (121) so how low is it?

  $Answer(e(-1).value)$

- **Query242** (1100) is it the last week of the patient?

$$Answer(Week(CurrentDate) == x) \land Order(x, -1, Sequence(d, d.type == Week))$$

- **Query243** (11111) how low is blood glucose level after dawn?

$$Answer(e.value) \land Lowest(e.value) \land After(e.time, Dawn()) \land$$
$$e.type == BGL$$

- **Click25** (20)

$$Click(e) \land e.type == Bolus \land e.time == 11:55pm$$

- **Query244** (11111) how low was blood glucose level after waking up?

$$Answer(e.value) \land Lowest(e.value) \land After(e.time, e_1.time) \land$$
$$e.type == BGL \land e_1.type == WakeUp$$

- **Click26** (20)

$$Click(e) \land e.type == HeartRate \land e.time == 9:44pm$$

- **Query245** (11101) is there any BGL reported that week?

$$Answer(Any(d.type == BGL \land d.time == Week(CurrentDate)))$$

- **Query246** (1100) is it their third day?

$$Answer(CurrentDay == x) \land Order(x, 3, Sequence(d, d.type == Day))$$

- **Query247** (10) click on the next to last sleep.

$$DoClick(e) \land Order(e, -2, Sequence(d, d.type == ReportedSleep \land$$
$$d.time == CurrentDay))$$

- **Query248** (12)

  $Click(e) \land e.type == HypoEvent \land e.time == 11{:}45\text{am}$

- **Query249** (12) she says she feels shakey.

- **Query250** (12) so what action does she take?

  $Answer(e) \land e.type == HypoAction \land Around(e.time, e(-2).time)$

- **Query251** (12) how low did he get during that morning?

  $Answer(e.value) \land Lowest(e.value) \land e.type == BGL\land$
  $$e.time == Morning()$$

- **Query252** (12) the BGL you showed me, is it a hypoglycemia?

  $Answer(Hypo(e(-1)))$

- **Query253** (12) What did she do when she went hypo?

  $Answer(e) \land Around(e.time, e(-1).time) \land e.type == DiscreteType$

- **Statement45** (01) I see that she has experienced a hypo event during the night.

  $e.type == HypoEvent \land e.time == Night()$

- **Query254** (111111^*) now when was this?

  $Answer(e(-1).time)$

- **Query255** (10) back to the day before please.

    $DoSetDate(CurrentDate - 1)$

- **Query256** (1100) is that the next to last week of the patient?

    $Answer(Week(CurrentDate) == x) \wedge Order(x, -2, Sequence(d, d.type == Week))$

- **Query257** (11101) has the mean skin temperature come down compared to yesterday?

    $Answer(Mean(d.value, d.type == SkinTemperature \wedge d.date == CurrentDate) <$
    $Mean(d.value, d.type == SkinTemperature \wedge d.date == CurrentDate - 1))$

- **Query258** (11111) how low does he go during that afternoon?

    $Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$
    $e.time == Afternoon()$

- **Query259** (11110) How many times per day does he eat something, generally?

    $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query260** (10) let's go to December 9.

    $DoSetDate(12 - 9 - 16)$

- **Statement46** (00) that seems to be his third month.

    $Order(x, 3, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$

- **Query261** (12)

    $Click(e) \wedge e.type == Bolus \wedge e.time == 10{:}20\text{am}$

- **Query262** (12) is that only one bolus?

  $Answer(Count(d, d.type == Bolus \wedge Around(d.time, e(-1).time)) == 1)$

- **Click27** (20)

  $Click(e) \wedge e.type == SkinTemperature \wedge e.time == 11:53\text{pm}$

- **Query263** (1100) is that the second day of the patient?

  $Answer(Day(CurrentDate) == x) \wedge Order(x, 2, Sequence(d, d.type == Day))$

- **Query264** (1101) how many days she has zero fingersticks?

  $$Answer(Count(x, Count(d, d.type == FingerSticks \wedge d.date == x) == 0 \wedge$$
  $$x.type == Date))$$

- **Query265** (11100) did he ever go to bed around 7:35pm?

  $Answer(Any(d.type == ReportedSleep \wedge Around(d.time, 7:35pm)))$

- **Query266** (10) can you go next day please?

  $DoSetDate(CurrentDate + 1)$

- **Query267** (10) this not being winter,we can turn off skin and air temperature.

  $DoToggle(Off, SkinTemperature) \wedge DoToggle(Off, AirTemperature)$

- **Query268** (12)

  $Click(e) \wedge e.type == Bolus \wedge e.time == 9:32\text{pm}$

43

- **Query269** (12) is that only one bolus?

  $Answer(Count(d, d.type == Bolus \land Around(d.time, e(-1).time)) == 1)$

- **Query270** (11101) is there any wakeup event reported that month?

  $Answer(Any(d.type == Wakeup \land d.time == Month(CurrentDate)))$

- **Query271** (112) when was the first time he changed his Infusion set?

  $Answer(e.date) \land Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query272** (11111) how high does she get during that evening?

  $$Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land$$
  $$e.time == Evening()$$

- **Query273** (11110) How many times a day does the patient eat, on average?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query274** (11111) can you show me the comments he has given us?

  $Answer(e) \land e.type == Misc$

- **Query275** (112) when is the last time he changes his Infusion set?

  $Answer(e.date) \land Order(e, -1, Sequence(d, d.type == InfusionSet))$

- **Query276** (11110) How many times a day does he eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query277** (10) click the third illness.

$$DoClick(e) \wedge Order(e, 3, Sequence(d, d.type == Illnesses \wedge$$
$$d.time == CurrentDay))$$

- **Query278** (11111) how low is step count after sleeping?

$$Answer(e.value) \wedge Lowest(e.value) \wedge After(e.time, e_1.time) \wedge$$
$$e.type == StepCount \wedge e_1.type == ReportedSleep$$

- **Query279** (10) so, move ahead to February 17.

$$DoSetDate(2 - 17 - 16)$$

- **Query280** (11100) are there any BGLs that are lower than -170

$$Answer(Any(d.value < -170 \wedge d.type == BGL))$$

- **Query281** (11101) has the mean skin temperature come down compared to yesterday?

$$Answer(Mean(d.value, d.type == SkinTemperature \wedge d.date == CurrentDate) <$$
$$Mean(d.value, d.type == SkinTemperature \wedge d.date == CurrentDate - 1))$$

- **Query282** (10) to the previous day.

$$DoSetDate(CurrentDate - 1)$$

- **Query283** (11100) did she ever go to bed around 11:51pm?

$$Answer(Any(d.type == ReportedSleep \wedge Around(d.time, 11 : 51pm)))$$

- **Query284** (11111) can we see the comments? There's 3 of them.

  $Answer(e) \wedge e.type == Misc$

- **Statement47** (00) that looks like her last day.

  $Order(x, -1, Sequence(d, d.type == Day)) \wedge x == Day(CurrentDate)$

- **Query285** (121) apparently she experienced a hypo event in the evening.

  $e.type == HypoEvent \wedge e.time == Evening()$

- **Query286** (121) so how bad was it?

  $Answer(e(-1).value)$

- **Query287** (11101) is there any skin temperature reported this month?

  $Answer(Any(d.type == SkinTemperature \wedge d.time == Month(CurrentDate)))$

- **Click28** (20)

  $Click(e) \wedge e.type == Misc \wedge e.time == 1{:}39\text{pm}$

- **Statement48** (00) this is his third day.

  $Order(x, 3, Sequence(d, d.type == Day)) \wedge x == Day(CurrentDate)$

- **Query288** (11101) is there a hypo action reported this month?

  $Answer(Any(d.type == HypoAction \wedge d.time == Month(CurrentDate)))$

- **Query289** (1101) how many days have multiple works?

$$Answer(Count(x, Count(d, d.type == Work \land d.date == x) > 1 \land x.type == Date))$$

- **Query290** (11101) is there a bolus reported that week?

$$Answer(Any(d.type == Bolus \land d.time == Week(CurrentDate)))$$

- **Query291** (11111) how low was blood glucose level before work?

$$Answer(e.value) \land Lowest(e.value) \land Before(e.time, e_1.time) \land$$
$$e.type == BGL \land e_1.type == Work$$

- **Query292** (1100) is this the second month of the patient?

$$Answer(Month(CurrentDate) == x) \land Order(x, 2, Sequence(d, d.type == Month))$$

- **Query293** (11111) show the comments.

$$Answer(e) \land e.type == Misc$$

- **Query294** (11100) did he always get some rest around 9:50am?

$$Answer(Cond(Around(x, 9 : 50am) ==> Any(d.type == ReportedSleep \land d.time == x)))$$

- **Click29** (20)

$$Click(e) \land e.type == Stressors \land e.time == 7:28am$$

- **Query295** (10) let's go back to the day before.

$$DoSetDate(CurrentDate - 1)$$

- **Query296** (1101) so what is the next to last month we have heart rate reported?

$$Answer(e.date) \land Order(e, -2, Sequence(d, d.type == HeartRate))$$

- **Query297** (11111) how low did he get during this morning?

$$Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land$$
$$e.time == Morning()$$

- **Query298** (10) go to Saturday.

$$DoSetDate(Saturday)$$

- **Query299** (11101) is there a work reported that day?

$$Answer(Any(d.type == Work \land d.date == CurrentDate))$$

- **Statement49** (00) this is his last week.

$$Order(x, -1, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$$

- **Query300** (12) how low does he go this evening?

$$Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land$$
$$e.time == Evening()$$

- **Query301** (12) the blood glucose you showed, is it a hypoglycemia?

$$Answer(Hypo(e(-1)))$$

- **Query302** (12) What did she do then?

$$Answer(e) \land Around(e.time, e(-1).time) \land e.type == DiscreteType$$

48

- **Query303** (1100) is this the last month of the patient?

$$Answer(Month(CurrentDate) == x) \wedge Order(x, -1, Sequence(d, d.type == Month))$$

- **Query304** (11110) How many times per day does he eat, on average?

$$Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$$

- **Click30** (20)

$$Click(e) \wedge e.type == Wakeup \wedge e.time == 9{:}10\text{pm}$$

- **Query305** (112) when is the next to last time he changes his Infusion set?

$$Answer(e.date) \wedge Order(e, -2, Sequence(d, d.type == InfusionSet))$$

- **Query306** (11110) How many times a day does he eat, on average?

$$Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$$

- **Query307** (11111) how high does she get during that afternoon?

$$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
$$e.time == Afternoon()$$

- **Query308** (112) when is the last time he changes his Infusion set?

$$Answer(e.date) \wedge Order(e, -1, Sequence(d, d.type == InfusionSet))$$

- **Query309** (11111) what was he doing during the evening when his skin temperature went up?

$$Answer(e) \wedge Behavior(e_1.value, Up) \wedge Around(e.time, e_1.time) \wedge$$
$$e_1.type == SkinTemperature \wedge e_1.time == Evening()$$

- **Query310** (112) when is the second time she changes her Infusion set?

  $Answer(e.date) \land Order(e, 2, Sequence(d, d.type == InfusionSet))$

- **Query311** (1100) is that her first month?

  $Answer(CurrentDay == x) \land Order(x, 1, Sequence(d, d.type == Month))$

- **Query312** (11101) Did she eat during the evening?

  $Answer(Any(d.type == Meal \land d.time == Evening))$

- **Click31** (20)

  $Click(e) \land e.type == ReportedSleep \land e.time == 2{:}50\text{am}$

- **Query313** (1100) are we on patient 575?

  $Answer(CurrentPatient == 575)$

- **Query314** (1101) how many days he has multiple wakeup events?

  $$Answer(Count(x, Count(d, d.type == Wakeup \land d.date == x) > 1 \land$$
  $$x.type == Date))$$

- **Query315** (11100) are there any step counts that are higher than 35

  $Answer(Any(d.value > 35 \land d.type == StepCount))$

- **Query316** (12) how low did she get during this night?

  $Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land e.time == Night()$

- **Query317** (12) the blood glucose you showed is a hypoglycemia?

  $Answer(Hypo(e(-1)))$

- **Query318** (12) What did she do when she went hypo?

  $Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$

- **Query319** (10) to the day before.

  $DoSetDate(CurrentDate - 1)$

- **Query320** (11100) does she always go to bed around 1:01am?

  $Answer(Cond(Around(x, 1:01am) ==> Any(d.type == ReportedSleep \wedge d.time == x)))$

- **Statement50** (01) it seems that he has experienced a hypo event in the evening.

  $e.type == HypoEvent \wedge e.time == Evening()$

- **Query321** (11110) How many times a day does she eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query322** (1101) so what is the second day they have meal reported?

  $Answer(e.date) \wedge Order(e, 2, Sequence(d, d.type == Meal))$

- **Query323** (1101) which year was that?

  $Answer(Year(CurrentDate))$

- **Query324** (1100)   is that the first week of the patient?

  $Answer(Week(CurrentDate) == x) \land Order(x, 1, Sequence(d, d.type == Week))$

- **Query325** (11101)   is there a sweat reported today?

  $Answer(Any(d.type == GSR \land d.date == CurrentDate))$

- **Query326** (11101)   is there any sweat reported today?

  $Answer(Any(d.type == GSR \land d.date == CurrentDate))$

- **Query327** (1100)   is this their third day?

  $Answer(CurrentDay == x) \land Order(x, 3, Sequence(d, d.type == Day))$

- **Statement51** (00)   that seems to be her second week.

  $Order(x, 2, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$

- **Click32** (20)

  $Click(e) \land e.type == BGL \land e.time == 7{:}07\text{pm}$

- **Query328** (10)   can we turn the hypo action on?

  $DoToggle(On, HypoAction)$

- **Click33** (20)

  $Click(e) \land e.type == BasalRate \land e.time == 6{:}42\text{pm}$

- **Click34** (20)

    $Click(e) \wedge e.type == BGL \wedge e.time == 10{:}51\text{pm}$

- **Query329** (1101) which day is it?

    $Answer(Day(CurrentDate))$

- **Query330** (11110) How many times per day does he eat, generally?

    $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query331** (121) apparently she has experienced a hypo during the night.

    $e.type == HypoEvent \wedge e.time == Night()$

- **Query332** (121) how low is this?

    $Answer(e(-1).value)$

- **Query333** (11111) now what was she doing midday when her skin temperature went up?

    $Answer(e) \wedge Behavior(e_1.value, Up) \wedge Around(e.time, e_1.time) \wedge$
    $\qquad e_1.type == SkinTemperature \wedge e_1.time == MidDay()$

- **Click35** (20)

    $Click(e) \wedge e.type == GSR \wedge e.time == 12{:}58\text{am}$

- **Query334** (121) apparently he experienced a hypo in the night.

    $e.type == HypoEvent \wedge e.time == Night()$

- **Query335** (121) so how low was this hypo event?

  $Answer(e(-1).value)$

- **Query336** (112) when was the last time he changed his Infusion set?

  $$Answer(e.date) \wedge Order(e, -1, Sequence(d, d.type == InfusionSet \wedge$$
  $$d.time == Before(CurrentDay)))$$

- **Statement52** (00) that looks like his second day.

  $$Order(x, 2, Sequence(d, d.type == Day)) \wedge x == Day(CurrentDate)$$

- **Query337** (11100) is there any heart rate more than -173

  $$Answer(Any(d.value > -173 \wedge d.type == HeartRate))$$

- **Query338** (12)

  $$Click(e) \wedge e.type == Bolus \wedge e.time == 7{:}30\text{pm}$$

- **Query339** (12) was that only one bolus?

  $$Answer(Count(d, d.type == Bolus \wedge Around(d.time, e(-1).time)) == 1)$$

- **Query340** (11111) can we see the comments he has given us? There's 4 of them.

  $$Answer(e) \wedge e.type == Misc$$

- **Click36** (20)

  $$Click(e) \wedge e.type == Wakeup \wedge e.time == 7{:}50\text{pm}$$

54

- **Query341** (112) when was the last time he changed his Infusion set?

$$Answer(e.date) \wedge Order(e, -1, Sequence(d, d.type == InfusionSet \wedge$$
$$d.time == Before(CurrentDay)))$$

- **Statement53** (01) I see heart rate went really low during the dusk.

$$Low(e.value) \wedge e.type == HeartRate \wedge e.time == Dusk()$$

- **Statement54** (01) he experienced 3 lows after a wakeup event.

$$Count(d, Hypo(d) \wedge After(d.time, d_1.time) \wedge d_1.type == Wakeup) == 3$$

- **Query342** (121) I see that the patient experienced a hypo event during the afternoon.

$$e.type == HypoEvent \wedge e.time == Afternoon()$$

- **Query343** (121) how low is it?

$$Answer(e(-1).value)$$

- **Query344** (11101) Did she eat during the morning?

$$Answer(Any(d.type == Meal \wedge d.time == Morning))$$

- **Query345** (11111) how low did she get during this evening?

$$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
$$e.time == Evening()$$

- **Query346** (121) apparently he has experienced a hypo event in the night.

$$e.type == HypoEvent \wedge e.time == Night()$$

- **Query347** (121) how low is it?

  $Answer(e(-1).value)$

- **Click37** (20)

  $Click(e) \wedge e.type == Illnesses \wedge e.time == 8{:}22\text{am}$

- **Query348** (11111) how high does she get that night?

  $Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge e.time == Night()$

- **Query349** (11110) How many times a day does she eat, on average?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Statement55** (01) around 10 o'clock during the day, heart rate went down.

  $Behavior(e.value, Down) \wedge Around(e.time, 10am) \wedge e.type == HeartRate$

- **Query350** (121) apparently she experienced a hypo in the night.

  $e.type == HypoEvent \wedge e.time == Night()$

- **Query351** (121) how low is it?

  $Answer(e(-1).value)$

- **Query352** (11111) how high was skin temperature before working?

  $Answer(e.value) \wedge Highest(e.value) \wedge Before(e.time, e_1.time) \wedge$
  $e.type == SkinTemperature \wedge e_1.type == Work$

- **Click38** (20)

    $Click(e) \land e.type == GSR \land e.time == 8{:}11\text{am}$

- **Click39** (20)

    $Click(e) \land e.type == GSR \land e.time == 7{:}57\text{pm}$

- **Click40** (20)

    $Click(e) \land e.type == HypoAction \land e.time == 9{:}29\text{am}$

- **Query353** (12)

    $Click(e) \land e.type == HypoEvent \land e.time == 11{:}45\text{am}$

- **Query354** (12)   she says she feels shakey.

- **Query355** (12)   so what action does she take?

    $Answer(e) \land e.type == HypoAction \land Around(e.time, e(-2).time)$

- **Statement56** (01)   during the evening, she goes low.

    $Hypo(e) \land e.time == Evening()$

- **Query356** (1100)   is this patient 502?

    $Answer(CurrentPatient == 502)$

- **Query357** (121)   I see that she has experienced a hypo event during the evening.

    $e.type == HypoEvent \land e.time == Evening()$

- **Query358** (121) how bad is that?

  $Answer(e(-1).value)$

- **Query359** (10) do the toggle so we don't see step counts.

  $DoToggle(Off, StepCount)$

- **Query360** (11110) How many times per day does she eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query361** (1101) which day is this?

  $Answer(Day(CurrentDate))$

- **Query362** (11111) how low does she get this morning?

  $$Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land$$
  $$e.time == Morning()$$

- **Query363** (11100) is there a blood glucose level that is higher than -38

  $Answer(Any(d.value > -38 \land d.type == BGL))$

- **Click41** (20)

  $Click(e) \land e.type == GSR \land e.time == 10:14\text{am}$

- **Query364** (11101) is there any work reported today?

  $Answer(Any(d.type == Work \land d.date == CurrentDate))$

- **Query365** (11111) what is she doing during the morning when her heart rate goes up?

$$Answer(e) \wedge Behavior(e_1.value, Up) \wedge Around(e.time, e_1.time) \wedge$$
$$e_1.type == HeartRate \wedge e_1.time == Morning()$$

- **Click42** (20)

$$Click(e) \wedge e.type == BGL \wedge e.time == 7{:}03am$$

- **Query366** (11101) has the mean step count gone up compared to yesterday?

$$Answer(Mean(d.value, d.type == StepCount \wedge d.date == CurrentDate) >$$
$$Mean(d.value, d.type == StepCount \wedge d.date == CurrentDate - 1))$$

- **Statement57** (01) I can see that the skin temperature goes extremely high in dusk.

$$High(e.value) \wedge e.type == SkinTemperature \wedge e.time == Dusk()$$

- **Query367** (111111*) does she do something at all?

$$Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$$

- **Click43** (20)

$$Click(e) \wedge e.type == Stressors \wedge e.time == 1{:}21am$$

- **Query368** (12)

$$Click(e) \wedge e.type == Meal \wedge e.time == 3{:}11am$$

- **Query369** (12) how low was the BGL then?

$$Answer(e.value) \wedge Lowest(e.value) \wedge Around(e.time, e(-1).time) \wedge$$
$$e.type == BGL$$

- **Statement58** (00) this seems to be his next to last week.

$$Order(x, -2, Sequence(d, d.type == Week)) \wedge x == Week(CurrentDate)$$

- **Query370** (1100) is it his last day?

$$Answer(CurrentDay == x) \wedge Order(x, -1, Sequence(d, d.type == Day))$$

- **Statement59** (00) this looks like his first day.

$$Order(x, 1, Sequence(d, d.type == Day)) \wedge x == Day(CurrentDate)$$

- **Query371** (1101) how many days she has less than 4 hypo actions?

$$Answer(Count(x, Count(d, d.type == HypoAction \wedge d.date == x) < 4 \wedge$$
$$x.type == Date))$$

- **Query372** (121) it seems that she experienced a hypo event during the night.

$$e.type == HypoEvent \wedge e.time == Night()$$

- **Query373** (121) so how low was it?

$$Answer(e(-1).value)$$

- **Query374** (1100) is that his first month?

$$Answer(CurrentDay == x) \wedge Order(x, 1, Sequence(d, d.type == Month))$$

60

- **Statement60** (01)   during the night, he went low.

    $Hypo(e) \land e.time == Night()$

- **Query375** (12)

    $Click(e) \land e.type == Meal \land e.time == 1{:}02\text{pm}$

- **Query376** (12)   how low was heart rate then?

    $Answer(e.value) \land Lowest(e.value) \land Around(e.time, e(-1).time) \land$
    $$e.type == HeartRate$$

- **Query377** (112)   when is the last time she changes her Infusion set?

    $Answer(e.date) \land Order(e, -1, Sequence(d, d.type == InfusionSet))$

- **Query378** (12)   how low does he go during this evening?

    $Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land$
    $$e.time == Evening()$$

- **Query379** (12)   the BGL you showed me, is it a hypoglycemia?

    $Answer(Hypo(e(-1)))$

- **Query380** (12)   What did he do then?

    $Answer(e) \land Around(e.time, e(-1).time) \land e.type == DiscreteType$

- **Query381** (11100)   is there another day she went low in the morning and evening?

    $Answer(Any(Hypo(d_1) \land Hypo(d_2) \land x! = CurrentDate \land$
    $x.type == Date \land d_1.time == Morning(x) \land d_2.time == Afternoon(x)))$

- **Query382** (11111) show the comments he has.

  $Answer(e) \wedge e.type == Misc$

- **Query383** (112) when is the third time she changes her Infusion set?

  $Answer(e.date) \wedge Order(e, 3, Sequence(d, d.type == InfusionSet))$

- **Query384** (121) it seems that the patient experienced a hypo event in the evening.

  $e.type == HypoEvent \wedge e.time == Evening()$

- **Query385** (121) so how bad is this hypo?

  $Answer(e(-1).value)$

- **Query386** (11100) did she ever go to bed around 1:19pm?

  $Answer(Any(d.type == ReportedSleep \wedge Around(d.time, 1:19pm)))$

- **Statement61** (00) that looks like his first day.

  $Order(x, 1, Sequence(d, d.type == Day)) \wedge x == Day(CurrentDate)$

- **Query387** (112) when was the first time she changed her Infusion set?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query388** (1101) which month is this?

  $Answer(Month(CurrentDate))$

- **Query389** (11100) is there some other day when she went low in the morning and evening?

  $Answer(Any(Hypo(d_1) \land Hypo(d_2) \land x! = CurrentDate \land$
  $\quad x.type == Date \land d_1.time == Morning(x) \land d_2.time == Afternoon(x)))$

- **Click44** (20)

  $Click(e) \land e.type == Work \land e.time == 12{:}05am$

- **Query390** (11100) are there any skin temperatures more than 181

  $Answer(Any(d.value > 181 \land d.type == SkinTemperature))$

- **Query391** (121) I see that the patient experienced a hypo event during the morning.

  $e.type == HypoEvent \land e.time == Morning()$

- **Query392** (121) how bad was this?

  $Answer(e(-1).value)$

- **Statement62** (00) this seems to be his next to last month.

  $Order(x, -2, Sequence(d, d.type == Month)) \land x == Month(CurrentDate)$

- **Query393** (1100) are we on patient 501?

  $Answer(CurrentPatient == 501)$

- **Query394** (11101) is there a illness reported that week?

  $Answer(Any(d.type == Illnesses \land d.time == Week(CurrentDate)))$

- **Click45** (20)

    $Click(e) \land e.type == BGL \land e.time == 5{:}56\text{am}$

- **Query395** (11110) How many times a day does the patient eat something, on average?

    $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query396** (12) how low does she go this morning?

    $Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land$
    $$e.time == Morning()$$

- **Query397** (12) the BGL you showed, it is hypoglycemia?

    $Answer(Hypo(e(-1)))$

- **Query398** (12) What did she do then?

    $Answer(e) \land Around(e.time, e(-1).time) \land e.type == DiscreteType$

- **Click46** (20)

    $Click(e) \land e.type == Hypo \land e.time == 11{:}53\text{am}$

- **Query399** (11100) is there some other day he went low in the morning and evening?

    $Answer(Any(Hypo(d_1) \land Hypo(d_2) \land x! = CurrentDate \land$
    $x.type == Date \land d_1.time == Morning(x) \land d_2.time == Afternoon(x)))$

- **Query400** (121) it seems that he experienced a hypo in the evening.

  $e.type == HypoEvent \land e.time == Evening()$

- **Query401** (121) so how bad was it?

  $Answer(e(-1).value)$

- **Query402** (11100) is there a sweat less than 355

  $Answer(Any(d.value < 355 \land d.type == GSR))$

- **Query403** (11111) can we see the comments?

  $Answer(e) \land e.type == Misc$

- **Query404** (11101) Did she eat during the night?

  $Answer(Any(d.type == Meal \land d.time == Night))$

- **Query405** (112) when was the last time he changed his Infusion set?

  $Answer(e.date) \land Order(e, -1, Sequence(d, d.type == InfusionSet \land$
  $d.time == Before(CurrentDay)))$

- **Query406** (11100) is there a blood glucose level less than 168

  $Answer(Any(d.value < 168 \land d.type == BGL))$

- **Statement63** (01) in the night, she goes low.

  $Hypo(e) \land e.time == Night()$

- **Query407** (1100) is it their second week?

  $Answer(CurrentDay == x) \wedge Order(x, 2, Sequence(d, d.type == Week))$

- **Query408** (12)

  $Click(e) \wedge e.type == HypoEvent \wedge e.time == 11:45\text{am}$

- **Query409** (12) she says that she feels shakey.

- **Query410** (12) so what does she do about it?

  $Answer(e) \wedge e.type == HypoAction \wedge Around(e.time, e(-2).time)$

- **Query411** (112) when was the first time she changed her Infusion set?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query412** (10) let's go to Saturday.

  $DoSetDate(Saturday)$

- **Query413** (11111) how high was heart rate after exercising?

  $$Answer(e.value) \wedge Highest(e.value) \wedge After(e.time, e_1.time) \wedge$$
  $$e.type == HeartRate \wedge e_1.type == Exercise$$

- **Click47** (20)

  $Click(e) \wedge e.type == BasalRate \wedge e.time == 9:12\text{pm}$

- **Query414** (1101) what day is it?

    $Answer(Day(CurrentDate))$

- **Query415** (121) apparently she has experienced a hypo event during the night.

    $e.type == HypoEvent \wedge e.time == Night()$

- **Query416** (121) how bad is it?

    $Answer(e(-1).value)$

- **Query417** (11101) is there any stressor reported today?

    $Answer(Any(d.type == Stressors \wedge d.date == CurrentDate))$

- **Query418** (112) when was the first time she changed her Infusion set?

    $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query419** (11111) how low was the sweat after working?

    $$Answer(e.value) \wedge Lowest(e.value) \wedge After(e.time, e_1.time) \wedge$$
    $$e.type == GSR \wedge e_1.type == Work$$

- **Query420** (11111) how high did she get this morning?

    $$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
    $$e.time == Morning()$$

- **Query421** (1100) is that her next to last week?

    $Answer(CurrentDay == x) \wedge Order(x, -2, Sequence(d, d.type == Week))$

- **Statement64** (01) I see that he experienced a hypo event during the morning.

  $e.type == HypoEvent \land e.time == Morning()$

- **Query422** (12) how low did she go during this afternoon?

  $Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land$
  $$e.time == Afternoon()$$

- **Query423** (12) so the blood glucose level you showed, is it hypoglycemia?

  $Answer(Hypo(e(-1)))$

- **Query424** (12) What does he do then?

  $Answer(e) \land Around(e.time, e(-1).time) \land e.type == DiscreteType$

- **Statement65** (00) this is his next to last day.

  $Order(x, -2, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Query425** (1100) is this their second month?

  $Answer(CurrentDay == x) \land Order(x, 2, Sequence(d, d.type == Month))$

- **Query426** (11110) How many times a day does she eat, on average?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query427** (1101) how many months have multiple stressors?

  $Answer(Count(x, Count(d, d.type == Stressors \land d.date == x) > 1 \land$
  $$x.type == Month))$$

- **Query428** (11111) let's look at the comments she has.

    $Answer(e) \wedge e.type == Misc$

- **Query429** (10) could you please turn the hypo action off?

    $DoToggle(Off, HypoAction)$

- **Query430** (121) it seems that he experienced a hypo event in the morning.

    $e.type == HypoEvent \wedge e.time == Morning()$

- **Query431** (121) so how low was it?

    $Answer(e(-1).value)$

- **Query432** (11100) is there a skin temperature that is lower than -38

    $Answer(Any(d.value < -38 \wedge d.type == SkinTemperature))$

- **Query433** (121) I see that he has experienced a hypo in the evening.

    $e.type == HypoEvent \wedge e.time == Evening()$

- **Query434** (121) so how bad was this hypo?

    $Answer(e(-1).value)$

- **Query435** (11110) How many times a day does he eat, generally?

    $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query436** (112) when was the last time he changed his Infusion set?

$$Answer(e.date) \wedge Order(e, -1, Sequence(d, d.type == InfusionSet \wedge$$
$$d.time == Before(CurrentDay)))$$

- **Query437** (112) when is the next to last time he changes his Infusion set?

$$Answer(e.date) \wedge Order(e, -2, Sequence(d, d.type == InfusionSet))$$

- **Query438** (1100) is that her next to last week?

$$Answer(CurrentDay == x) \wedge Order(x, -2, Sequence(d, d.type == Week))$$

- **Query439** (11101) has the step count come down compared to yesterday?

$$Answer(Mean(d.value, d.type == StepCount \wedge d.date == CurrentDate) <$$
$$Mean(d.value, d.type == StepCount \wedge d.date == CurrentDate - 1))$$

- **Query440** (1101) what month is this?

$$Answer(Month(CurrentDate))$$

- **Query441** (11101) is there any basal rate reported that week?

$$Answer(Any(d.type == BasalRate \wedge d.time == Week(CurrentDate)))$$

- **Statement66** (00) that is her last week.

$$Order(x, -1, Sequence(d, d.type == Week)) \wedge x == Week(CurrentDate)$$

- **Query442** (1100) is it the next to last month of the patient?

$$Answer(Month(CurrentDate) == x) \wedge Order(x, -2, Sequence(d, d.type == Month))$$

- **Query443** (1100) is that patient 575?

  $Answer(CurrentPatient == 575)$

- **Query444** (1101) how many months she has no boluss?

  $Answer(Count(x, Count(d, d.type == Bolus \wedge d.date == x) == 0 \wedge$
  $$x.type == Month))$$

- **Click48** (20)

  $Click(e) \wedge e.type == Work \wedge e.time == 5{:}54\text{am}$

- **Query445** (11100) is there any basal rate more than -482

  $Answer(Any(d.value > -482 \wedge d.type == BasalRate))$

- **Query446** (112) when is the second time she changes her Infusion set?

  $Answer(e.date) \wedge Order(e, 2, Sequence(d, d.type == InfusionSet))$

- **Statement67** (01) around 12 o'clock during the day, basal rate goes up.

  $Behavior(e.value, Up) \wedge Around(e.time, 12am) \wedge e.type == BasalRate$

- **Query447** (11101) is there any exercise reported that day?

  $Answer(Any(d.type == Exercise \wedge d.date == CurrentDate))$

- **Query448** (112) when was the first time she changed her Infusion set?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query449** (1101) what is the first day they also have step count reported?

  $Answer(e.date) \land Order(e, 1, Sequence(d, d.type == StepCount))$

- **Statement68** (00) that looks like her last week.

  $Order(x, -1, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$

- **Statement69** (01) I can see that step count is noticeably high in the mid afternoon.

  $High(e.value) \land e.type == StepCount \land e.time == MidAfternoon()$

- **Query450** (111111*) what happened after that?

  $Answer(e) \land After(e.time, e(-1).time)$

- **Statement70** (00) this seems to be his third week.

  $Order(x, 3, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$

- **Query451** (11101) is there a hypo action reported this day?

  $Answer(Any(d.type == HypoAction \land d.date == CurrentDate))$

- **Query452** (11110) How many times per day does he eat something, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Statement71** (00) this is his next to last week.

  $Order(x, -2, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$

- **Query453** (1100) is it her third month?

  $Answer(CurrentDay == x) \wedge Order(x, 3, Sequence(d, d.type == Month))$

- **Query454** (112) when is the next to last time she changes her Infusion set?

  $Answer(e.date) \wedge Order(e, -2, Sequence(d, d.type == InfusionSet))$

- **Query455** (121) I see that the patient experienced a hypo event in the night.

  $e.type == HypoEvent \wedge e.time == Night()$

- **Query456** (121) so how low is it?

  $Answer(e(-1).value)$

- **Query457** (11111) what are the comments?

  $Answer(e) \wedge e.type == Misc$

- **Query458** (11111) what was he doing midafternoon when his BGL went down?

  $$Answer(e) \wedge Behavior(e_1.value, Down) \wedge Around(e.time, e_1.time)$$
  $$\wedge\, e_1.type == BGL \wedge e_1.time == MidAfternoon()$$

- **Query459** (112) when was the first time he changed his Infusion set?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query460** (1101) which month was that?

  $Answer(Month(CurrentDate))$

- **Statement72** (01) around 2 o'clock during the day, step count goes down.

  $Behavior(e.value, Down) \wedge Around(e.time, 2am) \wedge e.type == StepCount$

- **Query461** (10) move ahead to July 6.

  $DoSetDate(7 - 6 - 16)$

- **Query462** (112) when was the first time she changed her Infusion set?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query463** (12) how low does he get this evening?

  $$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
  $$e.time == Evening()$$

- **Query464** (12) so the BGL you showed me, is it a hypoglycemia?

  $Answer(Hypo(e(-1)))$

- **Query465** (12) What did she do when she went hypo?

  $Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$

- **Statement73** (00) this is her first week.

  $Order(x, 1, Sequence(d, d.type == Week)) \wedge x == Week(CurrentDate)$

- **Query466** (10) let's go to Wednesday.

  $DoSetDate(Wednesday)$

- **Statement74** (01)   if you look around 10 o'clock during the day, heart rate goes down.

  $Behavior(e.value, Down) \land Around(e.time, 10am) \land e.type == HeartRate$

- **Query467** (112)   when was the first time he changed his Infusion set?

  $Answer(e.date) \land Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query468** (11100)   do we have some other day he goes low in the morning and evening?

  $Answer(Any(Hypo(d_1) \land Hypo(d_2) \land x! = CurrentDate \land$
  $x.type == Date \land d_1.time == Morning(x) \land d_2.time == Afternoon(x)))$

- **Query469** (1101)   so what is the next to last week we have skin temperature reported?

  $Answer(e.date) \land Order(e, -2, Sequence(d, d.type == SkinTemperature))$

- **Click49** (20)

  $Click(e) \land e.type == Exercise \land e.time == 8:09pm$

- **Query470** (11111)   how low did she go that night?

  $Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land e.time == Night()$

- **Statement75** (00)   this seems to be her last day.

  $Order(x, -1, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Query471** (1101)   how many months he has zero sleeps?

$$Answer(Count(x, Count(d, d.type == ReportedSleep \land d.date == x) == 0 \land$$
$$x.type == Month))$$

- **Query472** (1100)   is it their first week?

$$Answer(CurrentDay == x) \land Order(x, 1, Sequence(d, d.type == Week))$$

- **Query473** (1100)   is it his next to last week?

$$Answer(CurrentDay == x) \land Order(x, -2, Sequence(d, d.type == Week))$$

- **Statement76** (01)   if you look around 8 o'clock during the day, step count goes down.

$$Behavior(e.value, Down) \land Around(e.time, 8am) \land e.type == StepCount$$

- **Query474** (112)   when was the first time he changed his Infusion set?

$$Answer(e.date) \land Order(e, 1, Sequence(d, d.type == InfusionSet))$$

- **Query475** (12)   how low does he go during that evening?

$$Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land$$
$$e.time == Evening()$$

- **Query476** (12)   so the BGL you showed me is a hypoglycemia?

$$Answer(Hypo(e(-1)))$$

- **Query477** (12)   What did he do then?

$$Answer(e) \land Around(e.time, e(-1).time) \land e.type == DiscreteType$$

- **Query478** (112) when was the last time he changed his Infusion set?

$$Answer(e.date) \land Order(e, -1, Sequence(d, d.type == InfusionSet \land$$
$$d.time == Before(CurrentDay)))$$

- **Query479** (11110) How many times per day does she eat something, generally?

$$Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$$

- **Statement77** (01) in the afternoon, he goes low.

$$Hypo(e) \land e.time == Afternoon()$$

- **Query480** (12)

$$Click(e) \land e.type == HypoEvent \land e.time == 11:45am$$

- **Query481** (12) she says that she feels shakey.

- **Query482** (12) so what action does she take?

$$Answer(e) \land e.type == HypoAction \land Around(e.time, e(-2).time)$$

- **Query483** (11110) How many times per day does she eat, on average?

$$Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$$

- **Query484** (1101) what is the first week they have illness reported?

$$Answer(e.date) \land Order(e, 1, Sequence(d, d.type == Illnesses))$$

- **Click50** (20)

  $Click(e) \wedge e.type == Exercise \wedge e.time == 9\text{:}54\text{am}$

- **Click51** (20)

  $Click(e) \wedge e.type == FingerSticks \wedge e.time == 4\text{:}55\text{pm}$

- **Query485** (11111) how high was the blood glucose level before exercise?

  $$Answer(e.value) \wedge Highest(e.value) \wedge Before(e.time, e_1.time) \wedge$$
  $$e.type == BGL \wedge e_1.type == Exercise$$

- **Query486** (121) it seems that the patient experienced a hypo during the morning.

  $e.type == HypoEvent \wedge e.time == Morning()$

- **Query487** (121) so how bad is that hypo?

  $Answer(e(-1).value)$

- **Query488** (1101) what year is that?

  $Answer(Year(CurrentDate))$

- **Query489** (11101) is there a sleep reported today?

  $Answer(Any(d.type == ReportedSleep \wedge d.date == CurrentDate))$

- **Query490** (112) when is the third time he changes his Infusion set?

  $Answer(e.date) \wedge Order(e, 3, Sequence(d, d.type == InfusionSet))$

- **Query491** (11101) is there any work reported this day?

  $Answer(Any(d.type == Work \wedge d.date == CurrentDate))$

- **Query492** (11100) is there a heart rate which is less than -40

  $Answer(Any(d.value < -40 \wedge d.type == HeartRate))$

- **Query493** (1101) how many months have zero wakeup events?

  $$Answer(Count(x, Count(d, d.type == Wakeup \wedge d.date == x) == 0 \wedge$$
  $$x.type == Month))$$

- **Query494** (10) can you go back to the previous day please?

  $DoSetDate(CurrentDate - 1)$

- **Query495** (11111) can you show me the comments? There's 5 of them.

  $Answer(e) \wedge e.type == Misc$

- **Query496** (1101) what week is that?

  $Answer(Week(CurrentDate))$

- **Query497** (121) I see that the patient experienced a hypo in the morning.

  $e.type == HypoEvent \wedge e.time == Morning()$

- **Query498** (121) so how bad is it?

  $Answer(e(-1).value)$

- **Query499** (11101) is there any sleep reported today?

  $Answer(Any(d.type == ReportedSleep \wedge d.date == CurrentDate))$

- **Query500** (121) apparently he experienced a hypo event in the afternoon.

  $e.type == HypoEvent \wedge e.time == Afternoon()$

- **Query501** (121) how bad was it?

  $Answer(e(-1).value)$

- **Statement78** (01) the patient had 3 lows before a hypo event.

  $Count(d, Hypo(d) \wedge Before(d.time, d_1.time) \wedge d_1.type == Hypo) == 3$

- **Query502** (11101) is there a work reported that day?

  $Answer(Any(d.type == Work \wedge d.date == CurrentDate))$

- **Statement79** (01) I can see sweat went extremely low during the mid afternoon.

  $Low(e.value) \wedge e.type == GSR \wedge e.time == MidAfternoon()$

- **Query503** (112) when is the last time she changes her Infusion set?

  $Answer(e.date) \wedge Order(e, -1, Sequence(d, d.type == InfusionSet))$

- **Statement80** (00) that seems to be his first day.

  $Order(x, 1, Sequence(d, d.type == Day)) \wedge x == Day(CurrentDate)$

- **Query504** (11111)   how low is BGL before sleeping?

$$Answer(e.value) \wedge Lowest(e.value) \wedge Before(e.time, e_1.time) \wedge$$
$$e.type == BGL \wedge e_1.type == ReportedSleep$$

- **Query505** (1101)   which year was this?

$$Answer(Year(CurrentDate))$$

- **Statement81** (00)   this seems to be his last week.

$$Order(x, -1, Sequence(d, d.type == Week)) \wedge x == Week(CurrentDate)$$

- **Query506** (11110)   How many times per day does he eat, generally?

$$Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$$

- **Statement82** (00)   this is his next to last month.

$$Order(x, -2, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$$

- **Query507** (11111)   how low does he go during that evening?

$$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
$$e.time == Evening()$$

- **Statement83** (01)   around 12 o'clock at night, step count went up.

$$Behavior(e.value, Up) \wedge Around(e.time, 12pm) \wedge e.type == StepCount$$

- **Click52** (20)

$$Click(e) \wedge e.type == Stressors \wedge e.time == 5:34am$$

- **Query508** (11110) How many times a day does he eat something, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Statement84** (01) the patient had 3 lows following a meal.

  $Count(d, Hypo(d) \land After(d.time, d_1.time) \land d_1.type == Meal) == 3$

- **Query509** (112) when was the last time he changed his Infusion set?

  $Answer(e.date) \land Order(e, -1, Sequence(d, d.type == InfusionSet \land$
  $d.time == Before(CurrentDay)))$

- **Query510** (1101) how many days have multiple hypo actions?

  $Answer(Count(x, Count(d, d.type == HypoAction \land d.date == x) > 1 \land$
  $x.type == Date))$

- **Query511** (121) it seems that he experienced a hypo during the morning.

  $e.type == HypoEvent \land e.time == Morning()$

- **Query512** (121) so how bad is this hypo event?

  $Answer(e(-1).value)$

- **Query513** (12) let's turn the hypo event off.

  $DoToggle(Off, Hypo)$

- **Query514** (12) and the heart rate too

  $DoToggle(Off, HeartRate)$

- **Statement85** (00) this is her second day.

  $Order(x, 2, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Query515** (11111) what is she doing midday when her BGL goes up?

  $Answer(e) \land Behavior(e_1.value, Up) \land Around(e.time, e_1.time) \land$
  $$e_1.type == BGL \land e_1.time == MidDay()$$

- **Query516** (11110) How many times a day does she eat something, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Statement86** (00) this looks like his next to last week.

  $Order(x, -2, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$

- **Click53** (20)

  $Click(e) \land e.type == BGL \land e.time == 2{:}34\text{am}$

- **Statement87** (00) this seems to be her last day.

  $Order(x, -1, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Query517** (112) when is the second time he changes his Infusion set?

  $Answer(e.date) \land Order(e, 2, Sequence(d, d.type == InfusionSet))$

- **Query518** (1100) is that her third week?

  $Answer(CurrentDay == x) \land Order(x, 3, Sequence(d, d.type == Week))$

- **Query519** (1101) how many months have multiple exercises?

$$Answer(Count(x, Count(d, d.type == Exercise \land d.date == x) > 1 \land$$
$$x.type == Month))$$

- **Query520** (11111) can you show me the comments?

$$Answer(e) \land e.type == Misc$$

- **Query521** (1100) is that the second week of the patient?

$$Answer(Week(CurrentDate) == x) \land Order(x, 2, Sequence(d, d.type == Week))$$

- **Query522** (11111) now what is she doing midday when her skin temperature goes up?

$$Answer(e) \land Behavior(e_1.value, Up) \land Around(e.time, e_1.time) \land$$
$$e_1.type == SkinTemperature \land e_1.time == MidDay()$$

- **Query523** (11101) Did she eat during the evening?

$$Answer(Any(d.type == Meal \land d.time == Evening))$$

- **Query524** (10) let's go to Friday.

$$DoSetDate(Friday)$$

- **Query525** (10) go to Thursday.

$$DoSetDate(Thursday)$$

- **Click54** (20)

$$Click(e) \land e.type == FingerSticks \land e.time == 1:19am$$

- **Statement88** (00) that looks like his second week.

  $Order(x, 2, Sequence(d, d.type == Week)) \wedge x == Week(CurrentDate)$

- **Query526** (1100) is it her first week?

  $Answer(CurrentDay == x) \wedge Order(x, 1, Sequence(d, d.type == Week))$

- **Query527** (11101) is there a sleep reported that month?

  $Answer(Any(d.type == ReportedSleep \wedge d.time == Month(CurrentDate)))$

- **Query528** (10) let's go next day.

  $DoSetDate(CurrentDate + 1)$

- **Query529** (10) click on third hypo event.

  $DoClick(e) \wedge Order(e, 3, Sequence(d, d.type == Hypo \wedge$
  $d.time == CurrentDay))$

- **Query530** (10) let's go to the next day.

  $DoSetDate(CurrentDate + 1)$

- **Statement89** (00) this is his first month.

  $Order(x, 1, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$

- **Click55** (20)

  $Click(e) \wedge e.type == Wakeup \wedge e.time == 7{:}33am$

- **Query531** (11101) Did she eat during morning?

  $Answer(Any(d.type == Meal \wedge d.time == Morning))$

- **Query532** (1100) is this her last day?

  $Answer(CurrentDay == x) \wedge Order(x, -1, Sequence(d, d.type == Day))$

- **Query533** (12)

  $Click(e) \wedge e.type == Bolus \wedge e.time == 3{:}54\text{am}$

- **Query534** (12) is this only one bolus?

  $Answer(Count(d, d.type == Bolus \wedge Around(d.time, e(-1).time)) == 1)$

- **Query535** (112) when was the first time she changed her Infusion set?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query536** (11101) is there a skin conductance reported today?

  $Answer(Any(d.type == GSR \wedge d.date == CurrentDate))$

- **Query537** (121) I see that he has experienced a hypo event during the morning.

  $e.type == HypoEvent \wedge e.time == Morning()$

- **Query538** (121) how low was that?

  $Answer(e(-1).value)$

- **Query539** (11111) how high does he go during this morning?

$$Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land$$
$$e.time == Morning()$$

- **Query540** (112) when is the second time he changes his Infusion set?

$$Answer(e.date) \land Order(e, 2, Sequence(d, d.type == InfusionSet))$$

- **Query541** (10) can you go to the previous day please?

$$DoSetDate(CurrentDate - 1)$$

- **Query542** (112) when was the last time she changed her Infusion set?

$$Answer(e.date) \land Order(e, -1, Sequence(d, d.type == InfusionSet \land$$
$$d.time == Before(CurrentDay)))$$

- **Query543** (10) please turn the meal off.

$$DoToggle(Off, Meal)$$

- **Query544** (1100) is it the third day of the patient?

$$Answer(Day(CurrentDate) == x) \land Order(x, 3, Sequence(d, d.type == Day))$$

- **Query545** (11100) did she always go to bed around 7:45pm?

$$Answer(Cond(Around(x, 7 : 45pm) ==> Any(d.type == ReportedSleep \land d.time == x)))$$

- **Statement90** (01) I see that basal rate was very low in the dusk.

$$Low(e.value) \land e.type == BasalRate \land e.time == Dusk()$$

- **Query546** (1101) how many months she has 6 illnesss?

$$Answer(Count(x, Count(d, d.type == Illnesses \land d.date == x) == 6 \land$$
$$x.type == Month))$$

- **Query547** (112) when was the first time she changed her Infusion set?

$$Answer(e.date) \land Order(e, 1, Sequence(d, d.type == InfusionSet))$$

- **Query548** (1100) is this patient 505?

$$Answer(CurrentPatient == 505)$$

- **Query549** (1101) what week is that?

$$Answer(Week(CurrentDate))$$

- **Click56** (20)

$$Click(e) \land e.type == Illnesses \land e.time == 11:32am$$

- **Statement91** (01) I see heart rate went noticeably high at dusk.

$$High(e.value) \land e.type == HeartRate \land e.time == Dusk()$$

- **Query550** (10) please turn the skin conductance off.

$$DoToggle(Off, GSR)$$

- **Query551** (1101) how many weeks have less than 8 exercises?

$$Answer(Count(x, Count(d, d.type == Exercise \land d.date == x) < 8 \land$$
$$x.type == Week))$$

- **Statement92** (00) this looks like his next to last day.

  $Order(x, -2, Sequence(d, d.type == Day)) \wedge x == Day(CurrentDate)$

- **Click57** (20)

  $Click(e) \wedge e.type == Work \wedge e.time == 8{:}55\text{am}$

- **Query552** (11110) How many times a day does she eat something, generally?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Statement93** (00) that seems to be his second day.

  $Order(x, 2, Sequence(d, d.type == Day)) \wedge x == Day(CurrentDate)$

- **Statement94** (00) this seems to be his last month.

  $Order(x, -1, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$

- **Click58** (20)

  $Click(e) \wedge e.type == BasalRate \wedge e.time == 11{:}37\text{am}$

- **Query553** (1101) which year is this?

  $Answer(Year(CurrentDate))$

- **Statement95** (01) around 2 o'clock during the day, step count goes up.

  $Behavior(e.value, Up) \wedge Around(e.time, 2am) \wedge e.type == StepCount$

- **Query554** (11101) Did he eat during evening?

  $Answer(Any(d.type == Meal \land d.time == Evening))$

- **Query555** (11100) are there any blood glucose levels which are more than 197

  $Answer(Any(d.value > 197 \land d.type == BGL))$

- **Statement96** (01) around 6 o'clock at night, sweat went down.

  $Behavior(e.value, Down) \land Around(e.time, 6pm) \land e.type == GSR$

- **Query556** (12)

  $Click(e) \land e.type == HypoEvent \land e.time == 11{:}45am$

- **Query557** (12) she says that she feels shakey.

- **Query558** (12) so what does she do?

  $Answer(e) \land e.type == HypoAction \land Around(e.time, e(-2).time)$

- **Query559** (10) let's go to Monday.

  $DoSetDate(Monday)$

- **Query560** (11101) is there any work reported this month?

  $Answer(Any(d.type == Work \land d.time == Month(CurrentDate)))$

- **Query561** (11110) How many times a day does the patient eat something, generally?

$$Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$$

- **Query562** (10) let's go to the next day please.

$$DoSetDate(CurrentDate + 1)$$

- **Query563** (112) when was the last time she changed her Infusion set?

$$Answer(e.date) \land Order(e, -1, Sequence(d, d.type == InfusionSet \land$$
$$d.time == Before(CurrentDay)))$$

- **Query564** (112) when is the first time she changes her Infusion set?

$$Answer(e.date) \land Order(e, 1, Sequence(d, d.type == InfusionSet))$$

- **Query565** (10) click on the second wakeup event.

$$DoClick(e) \land Order(e, 2, Sequence(d, d.type == Wakeup \land$$
$$d.time == CurrentDay))$$

- **Query566** (12)

$$Click(e) \land e.type == Meal \land e.time == 3{:}08\text{pm}$$

- **Query567** (12) how low was blood glucose level then?

$$Answer(e.value) \land Lowest(e.value) \land Around(e.time, e(-1).time) \land$$
$$e.type == BGL$$

- **Query568** (1101) what week was this?

  $Answer(Week(CurrentDate))$

- **Query569** (11110) How many times a day does he eat, on average?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query570** (11101) has the average basal rate come down since yesterday?

  $Answer(Mean(d.value, d.type == BasalRate \land d.date == CurrentDate) <$
  $\quad Mean(d.value, d.type == BasalRate \land d.date == CurrentDate - 1))$

- **Statement97** (01) he had 2 lows before a bolus.

  $Count(d, Hypo(d) \land Before(d.time, d_1.time) \land d_1.type == Bolus) == 2$

- **Query571** (11101) is there a blood glucose level reported this week?

  $Answer(Any(d.type == BGL \land d.time == Week(CurrentDate)))$

- **Query572** (1101) so what is the second month we have sleep reported?

  $Answer(e.date) \land Order(e, 2, Sequence(d, d.type == ReportedSleep))$

- **Statement98** (00) this looks like her next to last day.

  $Order(x, -2, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Statement99** (01) around 8 o'clock at night, blood glucose level goes up.

  $Behavior(e.value, Up) \land Around(e.time, 8pm) \land e.type == BGL$

- **Query573** (112) when was the last time he changed his Infusion set?

  $Answer(e.date) \land Order(e, -1, Sequence(d, d.type == InfusionSet \land$
  $$d.time == Before(CurrentDay)))$$

- **Query574** (10) let's go next day please.

  $DoSetDate(CurrentDate + 1)$

- **Query575** (11101) Did he eat during the morning?

  $Answer(Any(d.type == Meal \land d.time == Morning))$

- **Query576** (10) toggle so we can see fingersticks.

  $DoToggle(On, FingerSticks)$

- **Query577** (11110) How many times per day does she eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query578** (1100) are we on patient 501?

  $Answer(CurrentPatient == 501)$

- **Click59** (20)

  $Click(e) \land e.type == Exercise \land e.time == 3:50am$

- **Query579** (112) when was the first time he changed his Infusion set?

  $Answer(e.date) \land Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Statement100** (00) that looks like his third month.

  $Order(x, 3, Sequence(d, d.type == Month)) \land x == Month(CurrentDate)$

- **Statement101** (00) that is her last week.

  $Order(x, -1, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$

- **Query580** (121) I see that he has experienced a hypo event in the afternoon.

  $e.type == HypoEvent \land e.time == Afternoon()$

- **Query581** (121) how low is that hypo?

  $Answer(e(-1).value)$

- **Query582** (10) so, let's move ahead to March 29.

  $DoSetDate(3 - 29 - 16)$

- **Query583** (11101) has the blood glucose level gone up compared to yesterday?

  $Answer(Mean(d.value, d.type == BGL \land d.date == CurrentDate) > Mean(d.value,$
  $d.type == BGL \land d.date == CurrentDate - 1))$

- **Statement102** (01) I can see the basal rate went pretty low in the mid afternoon.

  $Low(e.value) \land e.type == BasalRate \land e.time == MidAfternoon()$

- **Query584** (1100) are we on patient 505?

  $Answer(CurrentPatient == 505)$

- **Query585** (112) when is the first time he changes his Infusion set?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query586** (11111) how high does he get this night?

  $Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge e.time == Night()$

- **Query587** (112) when was the first time he changed his Infusion set?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query588** (11100) is there a step count that is higher than 457

  $Answer(Any(d.value > 457 \wedge d.type == StepCount))$

- **Statement103** (00) that seems to be his next to last month.

  $Order(x, -2, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$

- **Query589** (11100) are there any skin temperatures less than -402

  $Answer(Any(d.value < -402 \wedge d.type == SkinTemperature))$

- **Query590** (121) I see that he has experienced a hypo event during the morning.

  $e.type == HypoEvent \wedge e.time == Morning()$

- **Query591** (121) so how bad was it?

  $Answer(e(-1).value)$

- **Query592** (11111) how low did she get during that afternoon?

$$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
$$e.time == Afternoon()$$

- **Statement104** (01) I see that she has experienced a hypo in the morning.

$$e.type == HypoEvent \wedge e.time == Morning()$$

- **Statement105** (00) this is her next to last month.

$$Order(x, -2, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$$

- **Query593** (1101) what is the next to last week they have blood glucose level reported?

$$Answer(e.date) \wedge Order(e, -2, Sequence(d, d.type == BGL))$$

- **Query594** (11101) is there a step count reported this day?

$$Answer(Any(d.type == StepCount \wedge d.date == CurrentDate))$$

- **Query595** (1100) is this the second week of the patient?

$$Answer(Week(CurrentDate) == x) \wedge Order(x, 2, Sequence(d, d.type == Week))$$

- **Query596** (112) when was the first time he changed his Infusion set?

$$Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$$

- **Query597** (112) when was the first time he changed his Infusion set?

$$Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$$

- **Statement106** (01) the patient had 2 lows before a hypo action.

  $Count(d, Hypo(d) \land Before(d.time, d_1.time) \land d_1.type == HypoAction) == 2$

- **Query598** (111111*) when was that?

  $Answer(e(-1).time)$

- **Query599** (1101) so what is the third month we have stressor reported?

  $Answer(e.date) \land Order(e, 3, Sequence(d, d.type == Stressors))$

- **Query600** (10) could you please turn the hypo action off?

  $DoToggle(Off, HypoAction)$

- **Query601** (10) let's go to Tuesday.

  $DoSetDate(Tuesday)$

- **Query602** (11111) how high does she go this night?

  $Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land e.time == Night()$

- **Query603** (1101) how many days the patient has multiple fingersticks?

  $Answer(Count(x, Count(d, d.type == FingerSticks \land d.date == x) > 1 \land$
  $x.type == Date))$

- **Query604** (121) apparently he has experienced a hypo in the evening.

  $e.type == HypoEvent \land e.time == Evening()$

- **Query605** (121) how bad is it?

  $Answer(e(-1).value)$

- **Statement107** (01) in the afternoon, he goes low.

  $Hypo(e) \wedge e.time == Afternoon()$

- **Query606** (112) when was the first time he changed his Infusion set?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query607** (121) it seems that she has experienced a hypo event in the morning.

  $e.type == HypoEvent \wedge e.time == Morning()$

- **Query608** (121) how bad was that?

  $Answer(e(-1).value)$

- **Statement108** (01) it seems that he experienced a hypo during the night.

  $e.type == HypoEvent \wedge e.time == Night()$

- **Query609** (111111^*) what happened then?

  $Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$

- **Statement109** (01) around 10 o'clock during the day, skin conductance went down.

  $Behavior(e.value, Down) \wedge Around(e.time, 10am) \wedge e.type == GSR$

- **Query610** (1100) is it their next to last week?

  $Answer(CurrentDay == x) \land Order(x, -2, Sequence(d, d.type == Week))$

- **Query611** (11110) How many times per day does she eat something, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Statement110** (01) around 10 o'clock at night, blood glucose level went up.

  $Behavior(e.value, Up) \land Around(e.time, 10pm) \land e.type == BGL$

- **Statement111** (00) that is her first day.

  $Order(x, 1, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Query612** (11100) are there any step counts which are more than -204

  $Answer(Any(d.value > -204 \land d.type == StepCount))$

- **Query613** (10) can we turn off skin and air temperature?

  $DoToggle(Off, SkinTemperature) \land DoToggle(Off, AirTemperature)$

- **Query614** (1101) what week is it?

  $Answer(Week(CurrentDate))$

- **Query615** (11110) How many times per day does he eat, on average?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query616** (11110) How many times a day does she eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query617** (11100) did he ever take a nap around 2:36am?

  $Answer(Any(d.type == ReportedSleep \wedge Around(d.time, 2:36am)))$

- **Statement112** (00) this is her third month.

  $Order(x, 3, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$

- **Query618** (10) do the toggle so we do see the meals.

  $DoToggle(On, Meal)$

- **Query619** (11111) how high does she go during this morning?

  $Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$
  $$e.time == Morning()$$

- **Query620** (11100) are there any skin conductances which are lower than -337

  $Answer(Any(d.value < -337 \wedge d.type == GSR))$

- **Query621** (11100) did she always get some sleep around 7:55am?

  $Answer(Cond(Around(x, 7:55am) ==> Any(d.type == ReportedSleep \wedge d.time == x)))$

- **Statement113** (01) in the evening, she went low.

  $Hypo(e) \wedge e.time == Evening()$

- **Query622** (11110) How many times per day does the patient eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Statement114** (01) the patient experienced 3 lows before a fingerstick.

  $Count(d, Hypo(d) \land Before(d.time, d_1.time) \land$
  $$d_1.type == FingerSticks) == 3$$

- **Query623** (11100) does she always go to bed around 6:50pm?

  $Answer(Cond(Around(x, 6:50pm) ==> Any(d.type == ReportedSleep \land d.time == x)))$

- **Query624** (11100) did she ever take a nap around 9:09pm?

  $Answer(Any(d.type == ReportedSleep \land Around(d.time, 9:09pm)))$

- **Statement115** (00) this is her next to last week.

  $Order(x, -2, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$

- **Query625** (1100) is that patient 506?

  $Answer(CurrentPatient == 506)$

- **Query626** (11101) Did he eat during morning?

  $Answer(Any(d.type == Meal \land d.time == Morning))$

- **Query627** (10) click the first meal.

  $DoClick(e) \land Order(e, 1, Sequence(d, d.type == Meal \land$
  $$d.time == CurrentDay))$$

- **Query628** (11100) did he always go to bed around 12:57am?

  $Answer(Cond(Around(x, 12 : 57am) ==> Any(d.type == ReportedSleep \land d.time == x)))$

- **Query629** (10) we can turn off skin and air temperature.

  $DoToggle(Off, SkinTemperature) \land DoToggle(Off, AirTemperature)$

- **Query630** (121) apparently the patient experienced a hypo during the night.

  $e.type == HypoEvent \land e.time == Night()$

- **Query631** (121) so how bad was it?

  $Answer(e(-1).value)$

- **Query632** (10) back to the day before please.

  $DoSetDate(CurrentDate - 1)$

- **Query633** (112) when was the last time he changed his Infusion set?

  $Answer(e.date) \land Order(e, -1, Sequence(d, d.type == InfusionSet \land$
  $d.time == Before(CurrentDay)))$

- **Query634** (121) it seems that the patient has experienced a hypo event in the morning.

  $e.type == HypoEvent \land e.time == Morning()$

- **Query635** (121) so how low is this?

  $Answer(e(-1).value)$

- **Query636** (1101) how many weeks the patient has no exercises?

$$Answer(Count(x, Count(d, d.type == Exercise \land d.date == x) == 0 \land$$
$$x.type == Week))$$

- **Query637** (121) apparently she has experienced a hypo in the night.

$$e.type == HypoEvent \land e.time == Night()$$

- **Query638** (121) how low is it?

$$Answer(e(-1).value)$$

- **Query639** (1100) are we on patient 505?

$$Answer(CurrentPatient == 505)$$

- **Query640** (11101) has the mean basal rate come down since yesterday?

$$Answer(Mean(d.value, d.type == BasalRate \land d.date == CurrentDate) <$$
$$Mean(d.value, d.type == BasalRate \land d.date == CurrentDate - 1))$$

- **Query641** (11101) is there any fingerstick reported this day?

$$Answer(Any(d.type == FingerSticks \land d.date == CurrentDate))$$

- **Click60** (20)

$$Click(e) \land e.type == GSR \land e.time == 7{:}45\text{am}$$

- **Statement116** (01) I see that he experienced a hypo event during the evening.

$$e.type == HypoEvent \land e.time == Evening()$$

- **Query642** (111111*) what happened after this?

  $Answer(e) \land After(e.time, e(-1).time)$

- **Statement117** (00) that seems to be her next to last day.

  $Order(x, -2, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Statement118** (00) that seems to be her next to last week.

  $Order(x, -2, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$

- **Query643** (11100) do we have some other day when he went low in the morning and evening?

  $Answer(Any(Hypo(d_1) \land Hypo(d_2) \land x! = CurrentDate \land$
  $\quad x.type == Date \land d_1.time == Morning(x) \land d_2.time == Afternoon(x)))$

- **Statement119** (00) that seems to be her next to last day.

  $Order(x, -2, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Query644** (1100) are we on patient 505?

  $Answer(CurrentPatient == 505)$

- **Query645** (11110) How many times a day does he eat, on average?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query646** (12) how low does he go that night?

  $Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land e.time == Night()$

- **Query647** (12) the BGL you showed is a hypoglycemia?

  $Answer(Hypo(e(-1)))$

- **Query648** (12) What did she do when she went hypo?

  $Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$

- **Query649** (121) it seems that he experienced a hypo in the morning.

  $e.type == HypoEvent \wedge e.time == Morning()$

- **Query650** (121) so how bad was it?

  $Answer(e(-1).value)$

- **Query651** (12) how low does she go this morning?

  $$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL\wedge$$
  $$e.time == Morning()$$

- **Query652** (12) the blood glucose you showed is a hypoglycemia?

  $Answer(Hypo(e(-1)))$

- **Query653** (12) What did she do when she went hypo?

  $Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$

- **Query654** (1101) what is the next to last month we also have fingerstick reported?

  $Answer(e.date) \wedge Order(e, -2, Sequence(d, d.type == FingerSticks))$

- **Query655** (11101) is there any blood glucose level reported this week?

  $Answer(Any(d.type == BGL \land d.time == Week(CurrentDate)))$

- **Query656** (11100) is there any blood glucose level that is more than 63

  $Answer(Any(d.value > 63 \land d.type == BGL))$

- **Statement120** (00) that seems to be his third day.

  $Order(x, 3, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Query657** (1101) how many months have less than 8 miscellaneous events?

  $Answer(Count(x, Count(d, d.type == Misc \land d.date == x) < 8 \land x.type == Month))$

- **Query658** (11101) Did she eat during night?

  $Answer(Any(d.type == Meal \land d.time == Night))$

- **Query659** (121) I see that he has experienced a hypo in the night.

  $e.type == HypoEvent \land e.time == Night()$

- **Query660** (121) so how bad was it?

  $Answer(e(-1).value)$

- **Query661** (1100) is this their second month?

  $Answer(CurrentDay == x) \land Order(x, 2, Sequence(d, d.type == Month))$

- **Statement121** (01) apparently she has experienced a hypo in the night.

    $e.type == HypoEvent \wedge e.time == Night()$

- **Query662** (1101) what week is that?

    $Answer(Week(CurrentDate))$

- **Query663** (12)

    $Click(e) \wedge e.type == HypoEvent \wedge e.time == 11:45am$

- **Query664** (12) she says that she feels shakey.

- **Query665** (12) so what action does she take?

    $Answer(e) \wedge e.type == HypoAction \wedge Around(e.time, e(-2).time)$

- **Statement122** (01) around 5 o'clock during the day, BGL goes down.

    $Behavior(e.value, Down) \wedge Around(e.time, 5am) \wedge e.type == BGL$

- **Query666** (111111*) does she do anything?

    $Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$

- **Query667** (11101) is there any BGL reported that week?

    $Answer(Any(d.type == BGL \wedge d.time == Week(CurrentDate)))$

- **Click61** (20)

    $Click(e) \wedge e.type == Work \wedge e.time == 11:14am$

- **Query668** (112) when is the third time she changes her Infusion set?

  $Answer(e.date) \wedge Order(e, 3, Sequence(d, d.type == InfusionSet))$

- **Query669** (11101) has the average blood glucose level gone up compared to yesterday?

  $Answer(Mean(d.value, d.type == BGL \wedge d.date == CurrentDate) > Mean(d.value,$
  $d.type == BGL \wedge d.date == CurrentDate - 1))$

- **Query670** (112) when is the first time she changes her Infusion set?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query671** (11110) How many times a day does he eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query672** (11100) do we have some other day she goes low in the morning and evening?

  $Answer(Any(Hypo(d_1) \wedge Hypo(d_2) \wedge x! = CurrentDate \wedge$
  $x.type == Date \wedge d_1.time == Morning(x) \wedge d_2.time == Afternoon(x)))$

- **Query673** (12) how low does she get this afternoon?

  $Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$
  $e.time == Afternoon()$

- **Query674** (12) the blood glucose level you showed me is a hypoglycemia?

  $Answer(Hypo(e(-1)))$

- **Query675** (12) What does she do then?

  $Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$

- **Query676** (12)

  $Click(e) \wedge e.type == Meal \wedge e.time == 10{:}37\text{am}$

- **Query677** (12) how low was BGL?

  $Answer(e.value) \wedge Lowest(e.value) \wedge Around(e.time, e(-1).time) \wedge$
  $$e.type == BGL$$

- **Query678** (112) when is the next to last time he changes his Infusion set?

  $Answer(e.date) \wedge Order(e, -2, Sequence(d, d.type == InfusionSet))$

- **Statement123** (00) this looks like his last month.

  $Order(x, -1, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$

- **Query679** (11110) How many times per day does the patient eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query680** (11110) How many times per day does the patient eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query681** (10) back to the previous day please.

  $DoSetDate(CurrentDate - 1)$

- **Click62** (20)

  $Click(e) \land e.type == BasalRate \land e.time == 8:55\text{pm}$

- **Query682** (11100) is there any skin conductance more than -140

  $Answer(Any(d.value > -140 \land d.type == GSR))$

- **Query683** (1100) is it her second month?

  $Answer(CurrentDay == x) \land Order(x, 2, Sequence(d, d.type == Month))$

- **Query684** (11100) are there any blood glucose levels which are lower than 367

  $Answer(Any(d.value < 367 \land d.type == BGL))$

- **Query685** (11101) Did he eat during morning?

  $Answer(Any(d.type == Meal \land d.time == Morning))$

- **Query686** (11110) How many times per day does she eat something, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query687** (11100) did she always get some sleep around 7:32am?

  $Answer(Cond(Around(x, 7:32am) ==> Any(d.type == ReportedSleep \land d.time == x)))$

- **Query688** (1100) is it the second day of the patient?

  $Answer(Day(CurrentDate) == x) \land Order(x, 2, Sequence(d, d.type == Day))$

- **Query689** (11101) Did she eat during the evening?

  $Answer(Any(d.type == Meal \wedge d.time == Evening))$

- **Query690** (11111) how high was blood glucose level after working?

  $Answer(e.value) \wedge Highest(e.value) \wedge After(e.time, e_1.time) \wedge$
  $$e.type == BGL \wedge e_1.type == Work$$

- **Query691** (112) when is the last time she changes her Infusion set?

  $Answer(e.date) \wedge Order(e, -1, Sequence(d, d.type == InfusionSet))$

- **Statement124** (01) I can see sweat was a little low at dawn.

  $Low(e.value) \wedge e.type == GSR \wedge e.time == Dawn()$

- **Query692** (111111*) what did she eat?

  $Answer(e.food) \wedge Around(e.time, e(-1).time)$

- **Click63** (20)

  $Click(e) \wedge e.type == Misc \wedge e.time == 1:47\text{pm}$

- **Query693** (1100) is that the second day of the patient?

  $Answer(Day(CurrentDate) == x) \wedge Order(x, 2, Sequence(d, d.type == Day))$

- **Query694** (11101) has the average step count come down since yesterday?

  $Answer(Mean(d.value, d.type == StepCount \wedge d.date == CurrentDate) <$
  $Mean(d.value, d.type == StepCount \wedge d.date == CurrentDate - 1))$

- **Query695** (1100) are we on patient 504?

  $Answer(CurrentPatient == 504)$

- **Query696** (1100) are we on patient 101?

  $Answer(CurrentPatient == 101)$

- **Click64** (20)

  $Click(e) \wedge e.type == HeartRate \wedge e.time == 4{:}19\text{pm}$

- **Query697** (121) I see that she has experienced a hypo event during the evening.

  $e.type == HypoEvent \wedge e.time == Evening()$

- **Query698** (121) how low was it?

  $Answer(e(-1).value)$

- **Query699** (11100) is there any skin temperature that is higher than 373

  $Answer(Any(d.value > 373 \wedge d.type == SkinTemperature))$

- **Query700** (11110) How many times per day does she eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Statement125** (00) that is her third week.

  $Order(x, 3, Sequence(d, d.type == Week)) \wedge x == Week(CurrentDate)$

- **Query701** (10) could you please turn the illness off?

  $DoToggle(Off, Illnesses)$

- **Query702** (11111) how high was skin temperature before exercising?

  $Answer(e.value) \wedge Highest(e.value) \wedge Before(e.time, e_1.time) \wedge$
  $e.type == SkinTemperature \wedge e_1.type == Exercise$

- **Statement126** (00) that is his second month.

  $Order(x, 2, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$

- **Query703** (11110) How many times per day does he eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query704** (112) when is the second time she changes her Infusion set?

  $Answer(e.date) \wedge Order(e, 2, Sequence(d, d.type == InfusionSet))$

- **Query705** (121) it seems that he has experienced a hypo during the evening.

  $e.type == HypoEvent \wedge e.time == Evening()$

- **Query706** (121) so how low is that?

  $Answer(e(-1).value)$

- **Query707** (11101) is there any wakeup event reported this month?

  $Answer(Any(d.type == Wakeup \wedge d.time == Month(CurrentDate)))$

- **Query708** (11100) is there any blood glucose level that is higher than -483

  $Answer(Any(d.value > -483 \land d.type == BGL))$

- **Query709** (11111) how high was step count after dusk?

  $Answer(e.value) \land Highest(e.value) \land After(e.time, Dusk()) \land$
  $$e.type == StepCount$$

- **Statement127** (00) this is her third week.

  $Order(x, 3, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$

- **Statement128** (00) this seems to be her third month.

  $Order(x, 3, Sequence(d, d.type == Month)) \land x == Month(CurrentDate)$

- **Query710** (11101) has the skin conductance come down compared to yesterday?

  $Answer(Mean(d.value, d.type == GSR \land d.date == CurrentDate) < Mean(d.value,$
  $$d.type == GSR \land d.date == CurrentDate - 1))$$

- **Statement129** (00) this is his first week.

  $Order(x, 1, Sequence(d, d.type == Week)) \land x == Week(CurrentDate)$

- **Query711** (112) when was the last time she changed her Infusion set?

  $Answer(e.date) \land Order(e, -1, Sequence(d, d.type == InfusionSet \land$
  $$d.time == Before(CurrentDay)))$$

- **Query712** (11111) how low did he get this night?

  $Answer(e.value) \land Lowest(e.value) \land e.type == BGL \land e.time == Night()$

- **Query713** (1101) what day is it?

  $Answer(Day(CurrentDate))$

- **Query714** (11110) How many times per day does she eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query715** (11110) How many times a day does he eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Statement130** (00) that seems to be her first day.

  $Order(x, 1, Sequence(d, d.type == Day)) \land x == Day(CurrentDate)$

- **Query716** (11110) How many times per day does he eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query717** (1100) are we on patient 504?

  $Answer(CurrentPatient == 504)$

- **Statement131** (01) I see basal rate is noticeably low at the mid afternoon.

  $Low(e.value) \land e.type == BasalRate \land e.time == MidAfternoon()$

- **Query718** (1101) what is the second month they have exercise reported?

  $Answer(e.date) \land Order(e, 2, Sequence(d, d.type == Exercise))$

- **Query719** (1100) is this patient 504?

  $Answer(CurrentPatient == 504)$

- **Query720** (12) we can turn the hypo event off.

  $DoToggle(Off, Hypo)$

- **Query721** (12) and the skin conductance too

  $DoToggle(Off, GSR)$

- **Click65** (20)

  $Click(e) \wedge e.type == Illnesses \wedge e.time == 1{:}38am$

- **Statement132** (00) that seems to be his last month.

  $Order(x, -1, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$

- **Query722** (11110) How many times a day does she eat something, generally?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query723** (11111) how low does she go during that morning?

  $$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
  $$e.time == Morning()$$

- **Query724** (1100) is this the third month of the patient?

  $Answer(Month(CurrentDate) == x) \wedge Order(x, 3, Sequence(d, d.type == Month))$

- **Click66** (20)

  $Click(e) \wedge e.type == ReportedSleep \wedge e.time == 7{:}29\text{am}$

- **Statement133** (01) around 4 o'clock at night, heart rate goes up.

  $Behavior(e.value, Up) \wedge Around(e.time, 4pm) \wedge e.type == HeartRate$

- **Query725** (10) click the last sleep.

  $DoClick(e) \wedge Order(e, -1, Sequence(d, d.type == ReportedSleep \wedge$
  $$d.time == CurrentDay))$$

- **Statement134** (01) the patient had 2 lows following a illness.

  $Count(d, Hypo(d) \wedge After(d.time, d_1.time) \wedge d_1.type == Illnesses) == 2$

- **Statement135** (01) he had 3 lows after a wakeup event.

  $Count(d, Hypo(d) \wedge After(d.time, d_1.time) \wedge d_1.type == Wakeup) == 3$

- **Query726** (1101) which week is this?

  $Answer(Week(CurrentDate))$

- **Query727** (112) when was the last time she changed her Infusion set?

  $Answer(e.date) \wedge Order(e, -1, Sequence(d, d.type == InfusionSet \wedge$
  $$d.time == Before(CurrentDay)))$$

- **Statement136** (00) that is her first month.

  $Order(x, 1, Sequence(d, d.type == Month)) \wedge x == Month(CurrentDate)$

- **Query728** (112) when is the first time she changes her Infusion set?

  $Answer(e.date) \wedge Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Click67** (20)

  $Click(e) \wedge e.type == SkinTemperature \wedge e.time == 12{:}22\text{am}$

- **Query729** (121) it seems that she has experienced a hypo in the evening.

  $e.type == HypoEvent \wedge e.time == Evening()$

- **Query730** (121) so how bad is it?

  $Answer(e(-1).value)$

- **Click68** (20)

  $Click(e) \wedge e.type == Meal \wedge e.time == 12{:}33\text{am}$

- **Query731** (11110) How many times a day does he eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query732** (10) do the toggle so we can see sweats.

  $DoToggle(On, GSR)$

- **Statement137** (00) this seems to be his third day.

  $Order(x, 3, Sequence(d, d.type == Day)) \wedge x == Day(CurrentDate)$

- **Query733** (10) toggle so we don't see the skin temperatures.

  $DoToggle(Off, SkinTemperature)$

- **Query734** (11111) what are the comments she has?

  $Answer(e) \wedge e.type == Misc$

- **Query735** (11111) how high was blood glucose level after work?

  $$Answer(e.value) \wedge Highest(e.value) \wedge After(e.time, e_1.time) \wedge$$
  $$e.type == BGL \wedge e_1.type == Work$$

- **Query736** (10) we should turn the fingerstick off.

  $DoToggle(Off, FingerSticks)$

- **Query737** (11100) did she always get some rest around 6:44am?

  $Answer(Cond(Around(x, 6:44am) ==> Any(d.type == ReportedSleep \wedge d.time == x)))$

- **Query738** (12)

  $Click(e) \wedge e.type == HypoEvent \wedge e.time == 11{:}45am$

- **Query739** (12) she says that she feels shakey.

- **Query740** (12) so what action does she take?

  $Answer(e) \wedge e.type == HypoAction \wedge Around(e.time, e(-2).time)$

119

- **Query741** (1100) is that the third month of the patient?

  $Answer(Month(CurrentDate) == x) \land Order(x, 3, Sequence(d, d.type == Month))$

- **Query742** (11111) how low is basal rate before sleep?

  $Answer(e.value) \land Lowest(e.value) \land Before(e.time, e_1.time) \land$
  $\qquad\qquad e.type == BasalRate \land e_1.type == ReportedSleep$

- **Query743** (1100) are we on patient 563?

  $Answer(CurrentPatient == 563)$

- **Query744** (10) click on last work.

  $DoClick(e) \land Order(e, -1, Sequence(d, d.type == Work \land$
  $\qquad\qquad\qquad d.time == CurrentDay))$

- **Statement138** (01) she had 2 lows before a illness.

  $Count(d, Hypo(d) \land Before(d.time, d_1.time) \land d_1.type == Illnesses) == 2$

- **Query745** (112) when is the next to last time she changes her Infusion set?

  $Answer(e.date) \land Order(e, -2, Sequence(d, d.type == InfusionSet))$

- **Query746** (1101) what month is that?

  $Answer(Month(CurrentDate))$

- **Query747** (112) when is the second time she changes her Infusion set?

  $Answer(e.date) \land Order(e, 2, Sequence(d, d.type == InfusionSet))$

- **Query748** (12)

  $Click(e) \wedge e.type == HypoEvent \wedge e.time == 11:45\text{am}$

- **Query749** (12) she reports that she feels shakey.

- **Query750** (12) so what action does she take?

  $Answer(e) \wedge e.type == HypoAction \wedge Around(e.time, e(-2).time)$

- **Statement139** (01) I can see that the BGL went really high in mid afternoon.

  $High(e.value) \wedge e.type == BGL \wedge e.time == MidAfternoon()$

- **Query751** (111111*) what sort of meal did she eat?

  $Answer(e.food) \wedge Around(e.time, e(-1).time)$

- **Query752** (1101) what day was this?

  $Answer(Day(CurrentDate))$

- **Statement140** (00) this looks like his next to last week.

  $Order(x, -2, Sequence(d, d.type == Week)) \wedge x == Week(CurrentDate)$

- **Query753** (11111) let's see the comments he has.

  $Answer(e) \wedge e.type == Misc$

- **Query754** (121) I see that he has experienced a hypo during the evening.

  $e.type == HypoEvent \wedge e.time == Evening()$

121

- **Query755** (121) how low was it?

  $Answer(e(-1).value)$

- **Query756** (11100) is there another day when she goes low in the morning and evening?

  $Answer(Any(Hypo(d_1) \wedge Hypo(d_2) \wedge x! = CurrentDate \wedge$
  $x.type == Date \wedge d_1.time == Morning(x) \wedge d_2.time == Afternoon(x)))$

- **Query757** (12) how low does he get during this afternoon?

  $Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$
  $e.time == Afternoon()$

- **Query758** (12) the BGL you showed me is hypoglycemia?

  $Answer(Hypo(e(-1)))$

- **Query759** (12) What did she do when she went hypo?

  $Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$

- **Query760** (11111) how high is the basal rate before dawn?

  $Answer(e.value) \wedge Highest(e.value) \wedge Before(e.time, Dawn()) \wedge$
  $e.type == BasalRate$

- **Query761** (11110) How many times per day does he eat, generally?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query762** (11111) how low is skin conductance before exercise?

$$Answer(e.value) \wedge Lowest(e.value) \wedge Before(e.time, e_1.time) \wedge$$
$$e.type == GSR \wedge e_1.type == Exercise$$

- **Query763** (10) can we turn the blood glucose level off?

$$DoToggle(Off, BGL)$$

- **Query764** (11111) how low is the blood glucose level before sleep?

$$Answer(e.value) \wedge Lowest(e.value) \wedge Before(e.time, e_1.time) \wedge$$
$$e.type == BGL \wedge e_1.type == ReportedSleep$$

- **Query765** (12) how low does she go this morning?

$$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
$$e.time == Morning()$$

- **Query766** (12) so the blood glucose level you showed me, is it a hypoglycemia?

$$Answer(Hypo(e(-1)))$$

- **Query767** (12) What did she do when she went hypo?

$$Answer(e) \wedge Around(e.time, e(-1).time) \wedge e.type == DiscreteType$$

- **Query768** (11101) is there any skin temperature reported that day?

$$Answer(Any(d.type == SkinTemperature \wedge d.date == CurrentDate))$$

- **Query769** (121) apparently he has experienced a hypo during the evening.

$$e.type == HypoEvent \wedge e.time == Evening()$$

- **Query770** (121) so how low was it?

  $Answer(e(-1).value)$

- **Query771** (11111) how low did she go that afternoon?

  $$Answer(e.value) \wedge Lowest(e.value) \wedge e.type == BGL \wedge$$
  $$e.time == Afternoon()$$

- **Query772** (1101) what day is this?

  $Answer(Day(CurrentDate))$

- **Query773** (10) click on the third hypo event.

  $$DoClick(e) \wedge Order(e, 3, Sequence(d, d.type == Hypo \wedge$$
  $$d.time == CurrentDay))$$

- **Statement141** (01) if you look around 10 o'clock at night, skin conductance went up.

  $Behavior(e.value, Up) \wedge Around(e.time, 10pm) \wedge e.type == GSR$

- **Query774** (11110) How many times a day does he eat something, on average?

  $Answer(Mean(Count(d, d.type == Meal \wedge d.date == x), x.type == Date))$

- **Query775** (10) click the third fingerstick.

  $$DoClick(e) \wedge Order(e, 3, Sequence(d, d.type == FingerSticks \wedge$$
  $$d.time == CurrentDay))$$

- **Query776** (1100) is that their second month?

  $Answer(CurrentDay == x) \land Order(x, 2, Sequence(d, d.type == Month))$

- **Query777** (1100) are we on patient 502?

  $Answer(CurrentPatient == 502)$

- **Query778** (11110) How many times per day does he eat something, generally?

  $Answer(Mean(Count(d, d.type == Meal \land d.date == x), x.type == Date))$

- **Query779** (11100) is there another day he went low in the morning and evening?

  $Answer(Any(Hypo(d_1) \land Hypo(d_2) \land x! = CurrentDate \land$
  $\quad x.type == Date \land d_1.time == Morning(x) \land d_2.time == Afternoon(x)))$

- **Query780** (1100) is this his next to last month?

  $Answer(CurrentDay == x) \land Order(x, -2, Sequence(d, d.type == Month))$

- **Query781** (112) when was the first time she changed her Infusion set?

  $Answer(e.date) \land Order(e, 1, Sequence(d, d.type == InfusionSet))$

- **Query782** (1101) how many months she has multiple exercises?

  $Answer(Count(x, Count(d, d.type == Exercise \land d.date == x) > 1 \land$
  $\qquad\qquad\qquad x.type == Month))$

- **Query783** (10) let's go to Wednesday.

  $DoSetDate(Wednesday)$

- **Query784** (10)   can we turn off skin and air temperature?

  $DoToggle(Off, SkinTemperature) \land DoToggle(Off, AirTemperature)$

- **Query785** (10)   so, go to January 13.

  $DoSetDate(1 - 13 - 16)$

- **Query786** (1100)   is that patient 505?

  $Answer(CurrentPatient == 505)$

- **Query787** (1100)   is that his last day?

  $Answer(CurrentDay == x) \land Order(x, -1, Sequence(d, d.type == Day))$

- **Statement142** (01)   I see the BGL was pretty low in the midnight.

  $Low(e.value) \land e.type == BGL \land e.time == MidNight()$

- **Query788** (11100)   is there a heart rate that is lower than 421

  $Answer(Any(d.value < 421 \land d.type == HeartRate))$

- **Query789** (10)   this not being winter,can we turn off skin and air temperature?

  $DoToggle(Off, SkinTemperature) \land DoToggle(Off, AirTemperature)$

- **Statement143** (01)   I see BGL was extremely high during mid afternoon.

  $High(e.value) \land e.type == BGL \land e.time == MidAfternoon()$