SCORING LOGIC

HARD SCORE

One Patient One Slot

// One individual patient can only take one unique timeslot.

// If this is not met, then reduce the hard constraint score.

```
rule "1practitioner1slot"
when
PhqProcess($id :id, $selectedPractitioner : selectedPractitioner, $selectedPeriod: selectedPeriod, selectedPractitioner != null, !(selectedPractitioner.nilPractitioner) )
PhqProcess(id <$id, $selectedPractitioner == selectedPractitioner, $selectedPeriod == selectedPeriod )
then
scoreHolder.addHardConstraintMatch(kcontext, -28);
end
```

Practitioner Type – Counsellor, Psychologist, Psychiatrist

// The selected practitioner must match the required practitioner type for the specific patient according to the patient's PHQ9 score.

// The adequate practitioner type for the patient is computed in patient.getPractitionerType() function.

// If this is not met, then reduce the hard constraint score.

```
rule "practitionerSelection"
when
PhqProcess($selectedPractitioner : selectedPractitioner, selectedPractitioner != null,
!(selectedPractitioner.nilPractitioner),
assignedPatient.practitionerType != selectedPractitioner.role)
then
scoreHolder.addHardConstraintMatch(kcontext, -28);
end
```

Language

// The selected practitioner must speak the language that matches the specific patient's preferred language.

*// Since all the practitioners will be able to speak "English", the system will not check on "English"***,**

// The patient must specify a preferred language or "English" must be selected.

// If this is not met, then reduce the hard constraint score.

```
rule "languageRule"
when
PhqProcess($selectedPractitioner : selectedPractitioner, selectedPractitioner != null,
!(selectedPractitioner.nilPractitioner),
assignedPatient.preferLanguage != 0, // Patient prefer language != "English"
assignedPatient.preferLanguage != selectedPractitioner.language)
then
scoreHolder.addHardConstraintMatch(kcontext, -28);
end
```

Practitioner's Availability

// The practitioner must be available at the selected period.

// If this is not met, then reduce the hard constraint score.

```
rule "practitionerUnavailableRule"

when
PhqProcess($selectedPractitioner : selectedPractitioner, selectedPractitioner != null,
!(selectedPractitioner.nilPractitioner), $selectedPeriod : selectedPeriod, selectedPeriod != null,
selectedPractitioner.isUnavailablePeriod(selectedPeriod))
then
scoreHolder.addHardConstraintMatch(kcontext, -28);
end
```

Practitioner's Assignment

// When the system is able to allocate a practitioner, then award the hard constraint with positive increment.

// This is to push the system to assign an available practitioner, and not choose nilPractitioner which represents no available practitioner.

// At the same time, this also allows the system not to choose practitioner (i.e. choose nilPractitioner) in case other hard constraints are not met

// This rule also allows us to learn whether all the hard constraints are met by comparing the final hard constraint with the total PHQ9 points.

```
rule "phqRule"
when
PhqProcess(selectedPractitioner != null, !(selectedPractitioner.nilPractitioner), $phqScore : assignedPatient.phqScore, $phqScore>9)
then
scoreHolder.addHardConstraintMatch(kcontext, $phqScore);
End
```

SOFT SCORE

Gender

//Not meeting the gender constraint does not generally lead to a serious impact to the therapy outcome. Hence, it is categorized as soft constraint in order to attempt a match. Weightage is set to 80 because the least cost of a session is $80. This makes the soft score to be comparable to the cost.

rule "genderRule"

```
when
	PhqProcess($selectedPractioner : selectedPractioner, selectedPractioner != null,
	assignedPatient.preferGender != 0, // Patient prefer gender != "Any"
	assignedPatient.preferGender == selectedPractioner.gender)
then
	scoreHolder.addSoftConstraintMatch(kcontext,  80);
end
```

Preferred Location

//Patient's preferred location is a matter of convenience and does not adversely affect the outcome of the therapy. Hence, it is categorized as soft constraint to get the search algorithm to try. The weightage is same as gender.

rule "locationRule"

```
when
	PhqProcess($selectedPractioner : selectedPractioner, selectedPractioner != null,
	assignedPatient.preferLocation != 0, // Patient prefer location != "Any"
	assignedPatient.preferLocation == selectedPractioner.location)
then
	scoreHolder.addSoftConstraintMatch(kcontext,  80);
end
```

Preferred Day

//The patient may choose a preferred day for the session. It is not mandatory to match with the practitioners' slot, but a search attempt should be made. Hence, it is categorized as soft constraint. The weightage is same as gender.

rule "preferDayRule"

```
when
	PhqProcess($selectedPractioner : selectedPractioner, selectedPractioner != null,
		$selectedPeriod : selectedPeriod, selectedPeriod != null,
	assignedPatient.preferDay != null, // Patient prefer location != "Any"
	assignedPatient.preferDay == selectedPeriod.day)
then
	scoreHolder.addSoftConstraintMatch(kcontext,  80 );
end
```

Minimize Cost

//In the general healthcare landscape, the patient's cost should be minimized as much as possible. The highest fee is $120, hence the soft score is the saving measured from highest cost.

rule "costRule"

```
when
	PhqProcess($selectedPractioner : selectedPractioner, selectedPractioner != null)
then
	scoreHolder.addSoftConstraintMatch(kcontext, 120-$selectedPractioner.getCostEachHour());
end
```