

Worksheet 1

A declarative programming language is used to represent the following facts and rules:

```
01 male(ali).
02 male(raul).
03 male(ahmed).
04 male(philippe).
05 female(meena).
06 female(aisha).
07 female(gina).
08 parent(ali, raul).
09 parent(meena, raul).
10 parent(ali, ahmed).
11 parent(meena, ahmed).
12 parent(ali, aisha).
13 parent(meena, aisha).
14 father(A, B) IF male(A) AND parent(A, B).
```

These clauses have the following meaning:

Clause	Explanation
01	Ali is male
05	Meena is female
08	Ali is a parent of Raul
14	A is the father of B if A is male and A is a parent of B

(a) More facts are to be included.

Philippe and Gina are the parents of Meena.

Write the additional clauses to record this.

15

16[2]

(b) Using the variable P, the goal

```
parent(P, raul)
```

returns

```
P = ali, meena
```

Write the result returned by the goal

```
parent(ali, C)
```

C =[2]

- (c) Use the variable *F* to write the goal to find the father of Ahmed.

.....[1]

- (d) Write the rule to show that *X* is the mother of *Y*.

mother(*X*, *Y*)

IF

..... [2]

- (e) *W* is a grandparent of *Z* if *W* is a parent of one of *Z*'s parents.
Complete the following rule:

grandparent(*W*, *Z*)

IF

.....

.....[2]

- (f) Complete the rule to show that *G* is a grandfather of *K*.

grandfather(*G*, *K*)

IF

.....

.....[2]