Laporan Tugas Besar

IF2121 Logika Informatika

Tio The Knight in Shining Armor

Kelompok 11

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I. Hasil Eksekusi Setiap Perintah dalam Program

```
| ?- start.
Welcome to Tio`s world where anything is made up and nothing holds an importance!
Your job is to find Princess for Tio the Knight in Shining Armor by exploring this nonsense world!
You can explore by using command:
- look
- sleeping
- readmap
- goto(place)
- take(object)
- sharpen(object)
- quit

<story console>  look.
You are in castle
  You can see: armor shield maps
  Your inventory:

<story console>  sleeping.
You can only sleep in bedroom

<story console>  readmap.
You can`t read maps because you don`t have it

<story console>  take(maps).
You have taken a maps

<story console>  take(bed).
bed not found in the room

<story console>  goto(bedroom).
You are in bedroom
  You can see: bed
  Your inventory: maps

<story console>  sleeping.
Have a good night O Tio, Knight in Shining Armor

<story console>  readmap.
You open the wonderful map and see whats inside
dragon_treasury | armory | castle | bedroom |

<story console>  goto(castle)
That room is already your current location

<story console>  take(maps).
You already have maps
```

```
<story console>  take(armor).
You have taken a armor

<story console>  take(shield).
You have taken a shield

<story console>  goto(bedroom).
You are in bedroom
  You can see: bed
  Your inventory: shield armor maps

<story console>  goto(armory).
You are in armory
  You can see: desk sword
  Your inventory: maps shield armor

<story console>  take(sword).
You have taken a sword

<story console>  goto(bedroom).
You can`t get to bedroom from your current location

<story console>  goto(dragon_treasury).
You are in dragon_treasury
  You can see: princess
  Your inventory: sword maps shield armor

<story console>  take(princess).
You cannot save princess because of one of these things listed below :
1. You don`t have armor
2. You don`t have shield
3. You don`t have sword
4. You have sword but your sword hasn`t been sharpened

<story console>  sharpen(shield).
This object (shield) can`t be sharpened

<story console>  sharpen(sword).
Your sword has been sharpened

<story console>  goto(dragon_treasury).
That room is already your current location

<story console>  take(princess).

Congratulations Tio has found his true love
(5663 ms) yes
```

II. Pembagian Kerja

No.	Nama	NIM	Pembagian Kerja
1	Sri Umay Nur'aini Sholihah	13514007	Rules, Laporan - Pembagian Kerja, Editing
2	Wiega Sonora	13514019	Fakta, Laporan - Penjelasan Source Code

3	Bervianto Leo P	13514047	Game loop dan debug, Laporan - Hasil Eksekusi
4	Geraldi Dzakwan	13514065	Commands, execute, dan debug

III. Penjelasan Source Code

A. Game Loop

Game loop ini merupakan fungsi program untuk melakukan pengulangan selama game berlangsung. Struktur datanya dalah sebagai berikut.

```
game_loop          :-   repeat,
                        write('<story console>'),
                        spasi(2),
                        read(X),
                        execute(X),
                        (princess_saved; X==quit), !.
```

Game loop ini dimulai saat pemain mengetikkan "start". Program akan mengulangi untuk mengeluarkan output <story console> lalu meminta input suatu perintah / command dan menjalankan perintah tersebut. Pengulangan ini berhenti saat pemain memasukan perintah quit atau princess berhasil diselamatkan (princess_saved).

```
princess_saved :- inventory(princess), writeln('Congratulations Tio has found his true love'),
retractall(currentlocation(X)), retractall(inventory(X)), retractall(sharpened(X)), !.

quit :- writeln('Satria gives up. You quit the game, game is terminated.'),
retractall(currentlocation(X)), retractall(inventory(X)), retractall(sharpened(X)), !.
```

B. Fakta

Fakta dalam program ini dibagi menjadi dua, yaitu fakta statis dan fakta dinamis. Fakta statis meliputi list statis room, list statis daftar benda di dalam room, serta fakta ruangan bersebelahan yang diimplementasikan sebagai berikut.

```
list(room,[dragon_treasury,armory,castle,bedroom]).
list(bedroom, [bed]).
list(castle, [armor, shield, maps]).
list(armory, [desk, sword]).
list(dragon_treasury, [princess]).
list(sharp,[sword]).

door(bedroom,castle).
door(castle,armory).
door(armory,dragon_treasury).
```

Fakta dinamis dibuat menggunakan fungsi assertz sehingga fakta tersebut bisa berubah - ubah selama game dimainkan, fakta meliputi lokasi terkini, inventory, serta keadaan ketajaman pisau, dapat dilihat sebagai berikut.

```
dynamic_facts :-  assertz(currentlocation(castle)), assertz(inventory(clothes)),
assertz(sharpened(knife)).
```

C. Rules

Rules yang terdapat pada program berisi aturan aturan dasar seperti IsMember, isRoom, isSharpened, can_be_sharpen, objectlocation, connected, reachable, dan lain lain yang akan dimanfaatkan untuk membuat rule berdasar command input (look, goto, dll).

```
writeln(X) :- write(X), nl.
spasi(X) :- tab(X).
```

```
separator   :- write('|').

isMember(X,[X|_]).
isMember(X,[Y|Z]) :- X\==Y, isMember(X,Z).

isRoom(X) :- list(room,List), isMember(X,List).
isSharpened(X) :- list(sharpened,List), isMember(X,List).
can_be_sharpen(X) :- list(sharp,List), isMember(X,List).

objectlocation(X,Y) :- list(Y,List), isMember(X,List).

connected(X,Y) :- isRoom(X), isRoom(Y), door(X,Y).
connected(X,Y) :- isRoom(X), isRoom(Y), door(Y,X).

reachable(Room2) :- currentlocation(Room1), connected(Room1,Room2).

list_objects(Room) :- forall( (objectlocation(Obj,Room), \+inventory(Obj)), (write(Obj), spasi(1)) ).
list_inventory :- forall( (inventory(Obj), Obj\==clothes), (write(Obj), spasi(1)) ).
list_room :- forall( isRoom(Room), (write(Room), spasi(1), separator, spasi(1)) ).

move(Room) :- X\==Room,retract(currentlocation(X)), asserta(currentlocation(Room)).

cant_save_princess_why :- writeln('You cannot save princess because of one of these things listed
below :'),
writeln('1. You don`t have armor'),
writeln('2. You don`t have shield'),
writeln('3. You don`t have sword'),
writeln('4. You have sword but your sword hasn`t been sharpened').
```

D. Commands

Commands ini merupakan kumpulan rule yang sesuai dengan input perintah dari pemain, seperti look, sleeping, readmap, goto(place), take(object), sharpen(object), dan quit. Look menunjukkan posisi sekarang dengan memanggil currentlocation. Sleeping bisa dilakukan jika currentlocation(bedroom), jika tidak, muncul pesan kesalahan. Readmap bisa dilakukan saat maps sudah merupakan inventory yang dimiliki pemain. Fungsi goto(Room) membuat pemain berpindah ruangan sehingga currentlocation-nya berubah sesuai ruang yang dikehendaki serta jika ruangan tersebut terhubung dengan ruangan sebelumnya dan bukan merupakan ruangan yang sedang ditempati. Fungsi mengambil barang (take(Obj)) berguna untuk mengambil suatu benda apabila benda tersebut tersedia di ruangan yang sama dengan pemain, dalam fungsi ini ada kasus khusus untuk take(princess) karena program harus mengecek apakah pemain sudah mempunya berbagai benda yang dibutuhkan seperti armor, shield, serta sharpened sword. Yang terakhir yaitu command sharpen, bisa digunakan untuk menajamkan sesuatu yang mana hanyalah sword, jika pemain belum memiliki sword atau yang akan ditajamkan bukan sword akan muncul pesan kesalahan dari program.

```
look :- currentlocation(Y),
write('You are in'), spasi(1), writeln(Y), spasi(2),
write('You can see:'), spasi(1), list_objects(Y), writeln(''), spasi(2),
write('Your inventory:'), spasi(1), list_inventory, writeln('').

sleeping :- currentlocation(bedroom), write('Have a good night O Tio, Knight in Shining Armor'),
writeln('').
sleeping :- \+currentlocation(bedroom), write('You can only sleep in bedroom'), writeln('').
```

```
readmap :- inventory(maps),  writeln('You open the wonderful map and see whats inside'),
list_room, writeln('').
readmap :- \+inventory(maps),  write('You can`t read'), spasi(1), write(maps), spasi(1),
write('because you don`t have it'), writeln('').

goto(Room) :- currentlocation(Room), write('That room is already your current location'),
writeln(''), !.
goto(Room) :- isRoom(Room), currentlocation(Room_temp), Room\==Room_temp,
\+connected(Room,Room_temp), write('You can`t get to'), spasi(1), write(Room), spasi(1),
write('from your current location'), writeln(''), !.
goto(Room) :- \+isRoom(Room), writeln('Sorry your input is not room.'),!.
goto(Room) :- reachable(Room), move(Room), look.

take(Obj) :- inventory(Obj), write('You already have'), spasi(1), write(Obj), writeln(''), !.
take(Obj) :- currentlocation(Room), \+objectlocation(Obj,Room), write(Obj), spasi(1), write('not
found in the room'), writeln(''), !.
take(Obj) :- currentlocation(Room), objectlocation(Obj,Room), Obj\==princess,
asserta(inventory(Obj)), write('You have taken a'), spasi(1), write(Obj), writeln(''), !.
take(Obj) :- currentlocation(Room), objectlocation(Obj,Room), Obj == princess,
\+inventory(armor), cant_save_princess_why, !.
take(Obj) :- currentlocation(Room), objectlocation(Obj,Room), Obj == princess,
\+inventory(shield), cant_save_princess_why, !.
take(Obj) :- currentlocation(Room), objectlocation(Obj,Room), Obj == princess,
\+inventory(sword), cant_save_princess_why, !.
take(Obj) :- currentlocation(Room), objectlocation(Obj,Room), Obj == princess, inventory(sword),
\+sharpened(sword), cant_save_princess_why, !.
take(Obj) :- currentlocation(Room), objectlocation(Obj,Room), Obj == princess, inventory(armor),
inventory(shield), inventory(sword), asserta(inventory(Obj)).

sharpen(Obj) :- can_be_sharpen(Obj), inventory(Obj), asserta(sharpened(Obj)), write('Your'),
spasi(1), write(Obj), spasi(1), write('has been sharpened'), writeln(''), !.
sharpen(Obj) :- \+can_be_sharpen(Obj), write('This object ('), write(Obj), write(') can`t be
sharpened'), writeln(''), !.
sharpen(Obj) :- \+inventory(Obj), write('You don`t have'), spasi(1), write(Obj), writeln('').
```

IV. Referensi

http://www.amzi.com/AdventureInProlog/a14cntrl.php