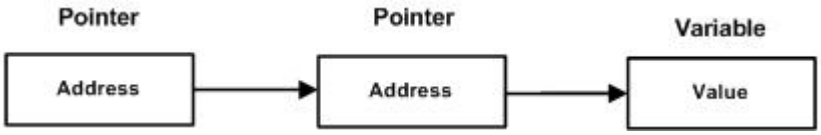
PASCAL - POINTER TO POINTER

A pointer to a pointer is a form of multiple indirection or a chain of pointers. Normally, a pointer contains the address of a variable. When we define a pointer to a pointer, the first pointer contains the address of the second pointer, which points to the location that contains the actual value as shown below.



A variable that is a pointer to a pointer must be declared as such. For example,

```
type
   iptr = ^integer;
   pointerptr = ^ iptr;
```

Following example would illustrate the concept as well as display the addresses −

```
program exPointertoPointers;
type
   iptr = ^integer;
   pointerptr = ^ iptr;

var
   num: integer;
   ptr: iptr;
   pptr: pointerptr;
   x, y : ^word;

begin
   num := 3000;

   (* take the address of var *)
   ptr := @num;

   (* take the address of ptr using address of operator @ *)
   pptr := @ptr;

   (* let us see the value and the adresses *)
   x:= addr(ptr);
   y := addr(pptr);

   writeln('Value of num = ', num );
   writeln('Value available at ptr^ = ', ptr^ );
   writeln('Value available at pptr^^ = ', pptr^^);
   writeln('Address at ptr = ', x^);
   writeln('Address at pptr = ', y^);
end.
```

When the above code is compiled and executed, it produces the following result −

```
Value of num = 3000
Value available at ptr^ = 3000
Value available at pptr^^ = 3000
Address at ptr = 36864
Address at pptr = 36880
```