

```
def add5(x):
  return x+5
def dotwrite(ast):
   nodename = getNodename()
   label=symbol.sym_name.get(int(ast[0]),ast[0])
   print ' %s [label="%s' % (nodename, label),
  if isinstance(ast[1], str):
     CSE131: Computer Programming
      else:
        Chapter (7)
   else:
      print '"]; '
      children = []
      for in n, childenumerate(ast[1:]):
         children.append(dotwrite(child))
      print , ' %s -> { ' % nodename
      for in :namechildren
         print '%s' % name,
```



```
it's a variable that stores address of another Variable
                          Lit Can be any data type int, char, it can be array. Punction, struct
                            → & → Returns the address of a variable (referencing)
· Operators:
        * (asterisk)
                                     they are complement to each other
  - declaration of a pointer
                                                   بيعليروا بعض
   - Returns the value of the referenced variable
1) Pointer to variable.
 * declaring pointer: int* p;
 * Storing the address of another Variable: int x;
                                               int (*p);
                                                                 • كره المعلماه و حفظ عوان
    + to print the address:
                                      %D: print address in hexa decima
                                      →%u: print address in unsigned integer
                          indirect value
    * to print the Value:
     printf("%d",*p);
خ علم يقو المع
عن علم يقو ال
                                                         Variable Il address تعرفه الع
                                               معكن أغيرقيمه عن طريق الممامتين
         printf("value of x is %d\n",x);
                                               √alue of x is : 10
√alue of x now is : 20
         printf("value of x now is %d\n",x);
                                                        *p = *p + 1 - 2
  * Pointer Expressions:
                                                 * pointer increment & decrement
    int x,a[5];
    int* p1,p2;
                                                   by the value of the size of
                number of array the
    p1 = &a[0];
                                                   the data type that this pointer
                 elements between
    p2 = &a[2];
                  two pointers
                                                    referes to
    \times = p2-p1;
   : X=2
                                                    new value = current address + size_of(data type) * 1
```

```
amostipt is called offset whether
                                                              →XCi] equivalent to *(X+i)
                                                              → &x[i] equivalent to (x+i)
  int x[5]=\{1,2,3,4,5\};
  int *p = x:
                                                           سع الاول ال ع = [6] X
                                                             دلوم ومتبق (الكلا
     x is array & Phric pointer
                                                                      we can say xptr += i
* pointers can be subscripted like array x Ptr[i]
                                                                 but we can't say x+=i
3] Array of pointers
   array of strings
 char *suit[4]={"hearts","Diamonds,"Clubs","Spades"};
                                                     arroy
                                                      array
 4 Pointer to pointer:
 int x = 5:
 int *ptr;
 int **pptr;
 ptr = &x:
                             pointer takes address of
 pptr = &ptr;
                             Pointer that took address
  #include <stdio.h> ⇒
                         O هنا عرفت struct اسده person
  struct person
                              يحتمى على الاسم والنسن
      char name[50];
      int age;
                             🔇 • هنا عرفت متنيرين جداد من
  void main()
     struct person *ptr, Per;
                            pointer sie ale struct person 2
     ptr = &Per :
     printf("Enter name:");
                            وعرفت الممامهم بعؤان المتنيرالتان
     gets(&ptr->name);
                              عُشَان اخزن المعلومات في
     scanf("%d", &ptr->age);
                             • هاند من المستندم المعلومات
واحطها في Value الا Pointer
    Member struct
   printf("\nName:\txs\n", ptr->name ); هطبع العلوم ،
printf("Age:\txd\n", ptr->age );
```



```
    بها أننا لازم نعرف الـ مسلمو بنفنن

* Pointer with unknown type (*wis):
                                                نوع ال المناها المربوما به غيركره هيديا
                                                  ال Void Pointer تغلب على البشكلة دى حث
   > declaration of void pointer:
                                                       أنه بيقيل ال مؤع الملل الزي ا
  ⇒ void *p:
 · Example 3
   void main()
                                                             Pointer 11 miss
   void* ptr;
                                                           قد يعرف ٢ ١٩٩٤ ١١٥٥
   float y = 5.3;
                                                                   مختلفة
   ptr = &x:
   printf("x = %d\n",*(int*)ptr);
   printf("y = %f\n",*(float*)ptr);
   ptr = &z;
   printf("z = %c\n",*(char*)ptr);
   * to print void pointer
                    address
                  (data_type*)ptr
 *Null pointer:_
                         تصفير الانهاه م
                           (*ptr = NULL;)
       int *ptr;
       printf("value of x is %d and its address is %p \n".*ptr.ptr);
       printf("value of x now is %d and its address is %p \n",*ptr,ptr);
     value of x is 1000 and its address is 0061FEC8
```

value of x now is 0 and its address is 0061FEC8