Assignment 1 of CE2004, Principles of Programming

Languages

Due Time: 12:00AM, 12th April 2011

P.S.:
(1) You need to type your answers in a file and print them out in answer sheets, then submit your answer sheets to the TAs.
(2) Late submission will not be accepted.
(3) You can discuss these questions with your classmates; however, copying other student’s answers is strictly prohibited.

(1) (5 points) What are the major language evaluation criteria?
Ans.

(2) (7 points) Nowadays, what methods are used to translate high level programs into machine ones?
Ans.

(3) (6 points) What is a language?
Ans.

(4) (8 points)
(a) What are “special words,” ”key words,” and ”reserved words”?
(b) If INTEGER and REAL are keywords in a language, then are the following statements correct?
    INTEGER REAL;
    REAL INTEGER;
(C) If INTEGER and REAL are reserved work in a language, then are the following statements correct?
    INTEGER REAL;
    REAL INTEGER;
Ans.
(5) (10 points) In the following C program excerpt,
(a) what programming bug does it have?
(b) what check could detect this bug?

#define BufferSize 100
char *poi="CSIE NCU is one of the best departments in Taiwan.";
char sentence[BufferSize];
int ppp(char *s, char *d, unsigned length)
{
    unsigned i, len;
    len=length;

    for( i=0 ;i<len; ++i )
    {
        *(d+i)=*(s+i);
    }
}
void goo(char *s, char *d, int length)
{
    if(length<BufferSize)
        ppp(poi,sentence,length);
}

(6) (7 points)
Compiler Optimization may cause what results in an executable file?

Ans.
(7) (10 points)
What follows is a C program.

```c
#include <stdio.h>
int total_income, total_visitors_global;

void zoo(char *name, int visitors)
{int adult, children;
 static int total_visitors=0;
  :
 total_visitors=total_visitors+visitors;  -- location 1
 total_visitors_global=total_visitors;
  :
}

main()
{
  int ticket_price_each_animal_type=2;

  printf("Good Morning!\n");  -- location 2
  zoo("giraff", 600);
  zoo("elephant", 300);
  zoo("hippo",100);
  total_income=ticket_price_each_animal_type*total_visitors_global;
  :
}
```

(a) At location 1, list the names of variables or parameters that have memory assigned to it.
(b) At location 2, list the names of variables or parameters that have memory assigned to it.

**Ans:**

(8) (7 points) What are the reasons that an interpreter usually takes a longer time to execute a program?

**Ans:**
(9) (10 points)
#include <stdio.h>
int a;
int b=1;

void bar(int c)
{int d;
 static int e=0;
 static int f;
     :
}

main()
{
 int g;
     :
}

For each variable or parameter in the above program, list the segment (e.g. data segment, stack segment, or BSS segment) that stores the variable or parameter once memory is assigned to it.
Ans.

(10) (10 points) (a) What are aliases? (b) What are the disadvantages of aliases?
Ans.

(11) (10 points) Why before a variable can be referenced in a program, it must be bound to a data type?
Ans.
(12) (10 points) What follows is an excerpt of a Javascript program.

```javascript
list = [1, 2]  // location 1

list = 47    // location 2

list = a        // location 3
```

(a) At location 1, what is the data type of variable list and list is stored at what segment?

(b) At location 2, what is the data type of variable list and list is stored at what segment?

(c) At location 3, what is the data type of variable list and list is stored at what segment?

Ans.