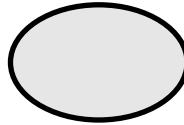


Total / 30



Please PRINT using keyboard letters :

Name :

Login :

@ucsc.edu

No books ; No calculator ; No computer ; No email ; No internet ; No notes ; No phone. Neatness counts ! Do your scratch work elsewhere and enter only your final answer into the spaces provided.

1. For each programming language in the following table, enter the name of one programmer associated with that language. Choose from the following list of names : Aho, Backus, Byron, Dahl, Dijkstra, Gosling, Hopper, Ichbiah, Iverson, Kernighan, Knuth, Lovelace, Matsumoto, McCarthy, Milner, Nygaard, Ritchie, Stroustrup, Thompson, van Rossum, Wall, Weinberger, Wirth, Zuze. If there is more than one programmer, choose any one who is applicable. **[2✓]**

Ada	C++
Cobol	Fortran
Java	Lisp
Pascal	Perl

2. Polymorphism : **[4✓]**

(a) Name two kinds of ad hoc polymorphism and give an example of each :

(b) Name two kinds of universal polymorphism and give an example of each :

3. Write a function in Perl which takes a filename as an argument and returns a pointer to a hash as a result. The keys of the hash are the words found in the file. The value associated with each key is a pointer to an array containing the line numbers where the word appears. The variable \$. is the current line number. Use \w+ (lower w) as the pattern to recognize a word. You can't just split on white space, since punctuation must also be removed. You may split on \W+ (upper W), but be aware that in that case an empty string might lead the array. **[4✓]**

```
sub makexref ($) {
    my ($filename) = @_;
```

4. Using proper C++ style, write a complete program that will print the numbers 1 to 100 to the standard output, one number per line. **[2✓]**

5. Write a Perl program which will iterate over its input using the general readline operator `<>`, and for each line read: print the line to the standard output on a line by itself, then have the shell execute the command, with the shell's output going to the standard output. The program continues until end of file on input, at which point it prints the message **SUCCESS**. But if any shell command fails, your program stops immediately and prints the message **FAILURE**. **[2✓]**

6. Write a program in Perl which will kill all processes that match the pattern given by `$ARGV[0]`. The Perl statement `@procs = `ps -eo pid,comm`;` will create an array each of whose elements contains one set of process information. Each element begins with white space, is followed by a process id (number), followed by more white space, followed by the program name. For each program that is matched by `$ARGV[0]` (a pattern), kill the process. The shell command `kill -9 $pid` will kill the process whose number is given by the variable `$pid`. Let the shell worry about all errors. **[2✓]**

7. Given an example which shows the difference between lexical and dynamic scope. **[2✓]**

8. What is a static (access) link? What is a dynamic (control) link? **[2✓]**

Multiple choice. To the *left* of each question, write the letter that indicates your answer. Write 'Z' if you don't want to risk a wrong answer. Wrong answers are worth negative points. **[11✓]**

number of correct answers		$\times 1 =$	$= a$
number of wrong answers		$\times \frac{1}{2} =$	$= b$
number of missing answers		$\times 0 =$	0
column total $c = \max(a - b, 0)$	11		$= c$

- Backus-Naur form is a notation used to define the ____ of a language.
 - lexical structure
 - scope of variables
 - semantics
 - syntax
- A static variable in C or C++ is bound to a particular virtual address at:
 - compilation (translation) time.
 - link (ld) time.
 - load (exec) time.
 - after `main` begins execution.
- Given the declarations shown here, C will determine if they are the same or different by using ____ equivalence.


```
typedef int (*t1) (int);
typedef int (*t2) (int);
```

 - anonymous
 - name
 - structural
 - value
- In C++, what kind of cast could be used to convert a `double` into an `int`?
 - `const_cast`
 - `dynamic_cast`
 - `reinterpret_cast`
 - `static_cast`
- If two functions of the same name in the same class are declared, but with different signatures (prototypes), this is referred to as:
 - overhanging
 - overlapping
 - overloading
 - overriding


- In Ocaml, the following interaction shows that the type of the function `f` is known without explicit declaration.

```
# let f x = x + 1;;
val f : int -> int = <fun>
```

This is known as:

- dynamic typing
 - type checking
 - type equivalence
 - type inference
- In C++, which member of class `foo` will be used in the following statement, assuming `x` is of type `foo`?


```
foo t = x;
```

 - `foo ()`;
 - `foo (const foo&)`;
 - `foo &operator= (const foo &)`;
 - `~foo ()`;
 - Which is a C++ keyword that could cause a pointer to become dangling?
 - `delete`
 - `friend`
 - `new`
 - `virtual`
 - Given the declaration `int **p;`, what expression will cause a compilation time error message?
 - `&(&p)`
 - `&(*p)`
 - `*(&p)`
 - `*(*p)`
 - If we have a hash where each value is a pointer to an array, to append a new value to an array, we could say:
 - `push %{$hash->{$key}}, $new;`
 - `push %{@hash<-{$key}}, $new;`
 - `push @@hash->[$key], $new;`
 - `push @{$hash{$key}}, $new;`
 - 
 - DEK215
 - DMR215
 - EWD215
 - GMH215