Chapter 0

Exercises

Course “Compiler Construction”

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Section

Exercises 07

7.1: C RTE & scoping
7.2: Pascal RTE & access links
7.3: Display
7.4: VFT & memory layout for classes
7.5: Parameter passing (1)
7:6. Paramter passing (2): swap

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7.1: Program

```
int a[10];
char * s = "hello";

int f(int i, int b[])
{ int j=i;
 A:{ int i=j;
     char c = b[i];
     //...;
   }
   return 0;
}

void g(char * s)
{ char c = s[0];
 B:{ int a[5];
     // ...;
   }
}

main ()
{ int x=1;
  x = f(x,a);
  g(s);
  return 0;
}
```

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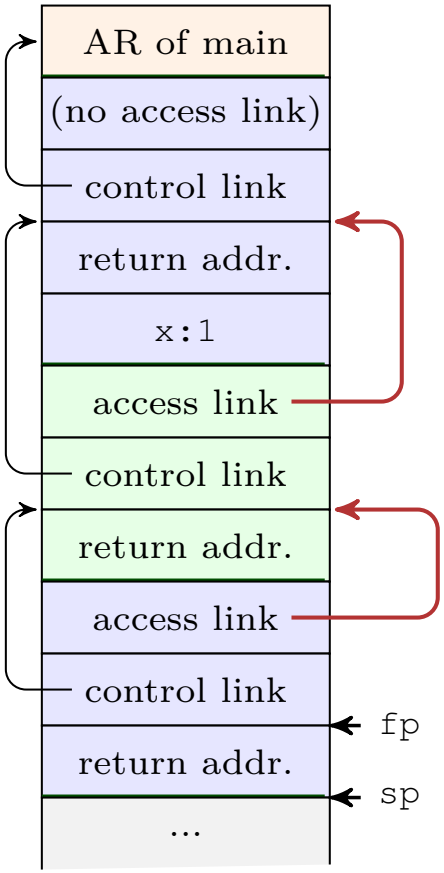
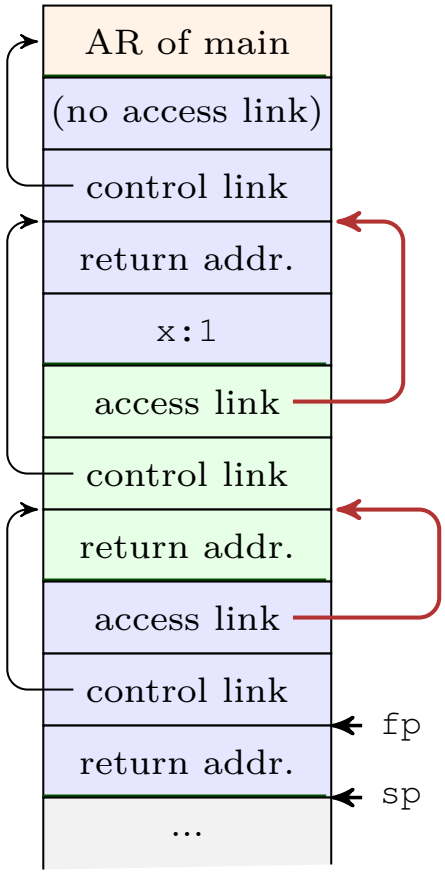
7.2: Pascal program: control and access links

```
program env;

procedure a;
var x: integer;

    procedure b;
        procedure c;
        begin
            x := 2;
            b;
        end;
    begin (* b *)
        c;
    end;

begin (* a *)
    b;
end;

begin (* main *)
    a;
end.
```

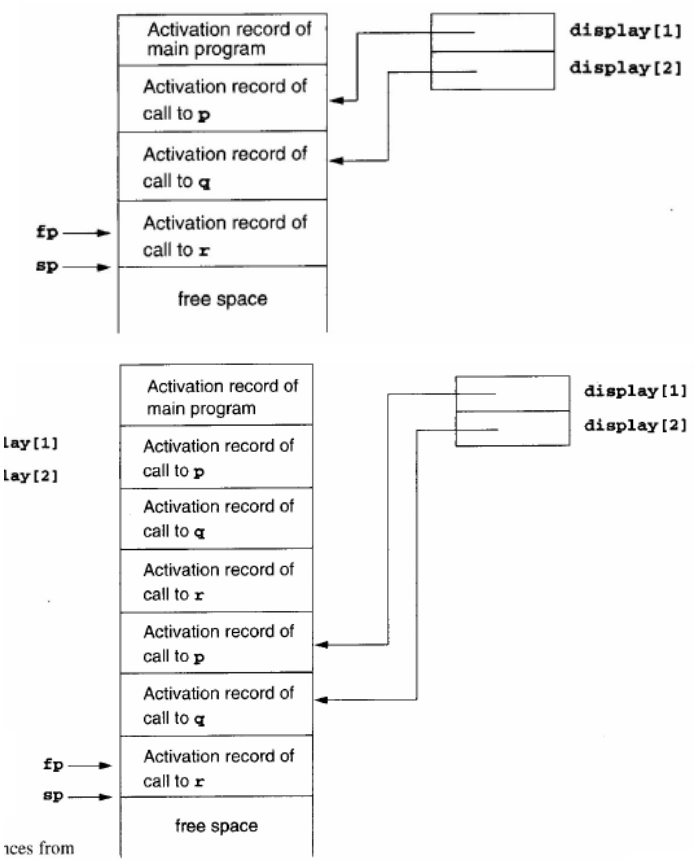
Exercises 07

7.3: Run-time stacks without display (cf. lecture)





7.3: Run-time stacks with display



Exercises 07

7.4: C++ kind of class defs

```
class A
{ public:
  int a;
  virtual void f();
  virtual void g();
};

class B : public A
{ public:
  int b;
  virtual void f();
  void h();
};


class C: public B
{ public:
  int c;
  virtual void g();
}
```

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7.5. Example

```
#include <stdio.h>
int i = 0;

void p(int x, int y)
{ x += 1;
  i += 1;
  y += 1;
}

main ()
{ int a[2] = {1,1};
  p(a[i],a[i]);
  printf("%d %d\n",a[0], a[1]);
  return 0;
}
```

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7.6: Example: swap

```c
#include <stdio.h>
int i = 0;

void swap (int x, int y)
{
   x = x + y;
   y = x - y;
   x = x - y;
}

main ()
{ int a[3] = {1,2,0};
   swap(i,a[i]);
   printf("%d %d %d %d\n",i,a[0], a[1],a[2]);
   return 0;
}
```

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