2021 Numerical Analysis Lab HW#1

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1.Palindromic prime number

```
program ppn
    implicit none
    integer :: sum, temp1, r, n, num, cnt, temp2
    num = 1
    cnt = 0
    do
        sum = 0
        temp1 = num
        do while(temp1>0)
            r = mod(temp1,10)
            sum = sum*10+r
            temp1 = temp1/10
        end do
        if(sum .eq. num) then
            temp2 = prime(num)
            if(temp2 == 1) then
                cnt = cnt+1
                if(cnt == 100) then
                    exit
                end if
            end if
        end if
        num = num+1
    end do
    print *, "the 100th palindrome prime is", num

contains
integer function prime(n)
    integer :: i,n
    i = 1
    do while(i < n)
        if((mod(n,i) .eq. 0) .and. i/=1) then
            prime = 0
            exit
        else
            prime = 1
        end if
        i = i+1
    end do

end function

end program
```

```
[(base) desktop gfortran ppn.f90
[(base) desktop ./a.out
  the 100th palindrome prime is       94049
 (base) desktop
```

2. Trace

```
program trace
    implicit none
    integer :: j,k,temp,m,n, a(1000,1000)
    read(*,*) m, n
    do j=1,m
        do k=1,n
            read(*,*) temp
            a(j,k) = temp
        end do
        print *, "--------------"
    end do

    print *, sum_is(a)

    contains
    integer function sum_is(dim)
        integer :: sum = 0, dim(1000, 1000), i
        if(m<n) then
            do i=1, m
                sum = sum + dim(i, i)
            end do
        else
            do i=1, n
                sum = sum + dim(i,i)
            end do
        end if
        sum_is = sum
    end function sum_is
END PROGRAM trace
```

```
[(base) desktop gfortran trace.f90
[(base) desktop ./a.out
 2 3
 5
 6
 8
  --------------
 3
 4
 6
  --------------
           9
[(base) desktop
[(base) desktop gfortran trace.f90
[(base) desktop ./a.out
 4 4
 3
 4
 6
 7
  --------------
 2
 6
 7
 8
  --------------

 5
 3
 4
 2
  --------------
 2
 4
 8
 9
  --------------
          22
 (base) desktop
```