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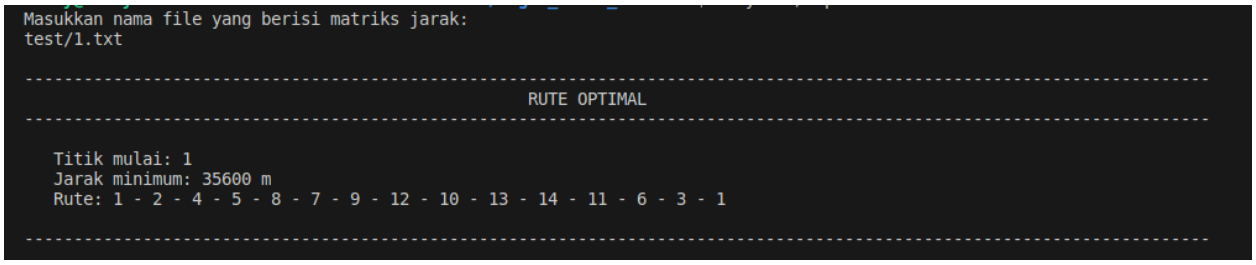
Source Code

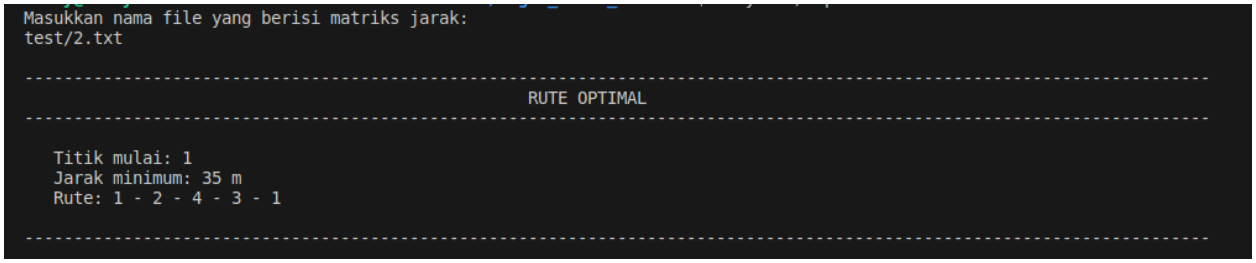
```
INF = Float::INFINITY

def tsp(dist, mask, pos, n, dp, parent)
 return dist[pos][0] if mask == (1 << n) - 1

 return dp[pos][mask] if dp[pos][mask] != -1

 min = INF

 n.times do |city|
   if (mask & (1 << city)) == 0
     new_dist = dist[pos][city] + tsp(dist, mask | (1 << city), city, n,
dp, parent)
     if new_dist < min
       min = new_dist
       parent[pos][mask] = city
     end
   end
 end

 dp[pos][mask] = min
 min
end

def print_path(parent, pos, mask, n)
 return if mask == (1 << n) - 1

 next_pos = parent[pos][mask]
 print "#{next_pos + 1} - "
 print_path(parent, next_pos, mask | (1 << next_pos), n)
end
```

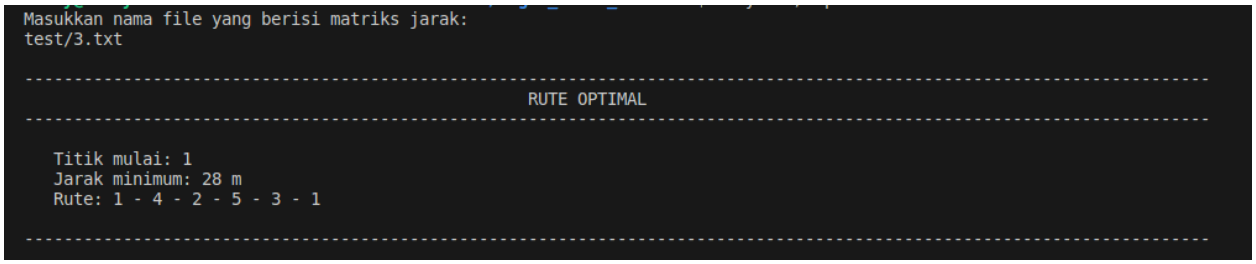
```ruby
def read_distances(file_path)
 dist = []
 File.readlines(file_path).each do |line|
   dist << line.split.map(&:to_i)
 end
 dist
end

puts "Masukkan nama file yang berisi matriks jarak:"
file_path = gets.chomp

begin
 dist = read_distances(file_path)
 n = dist.length

 dp = Array.new(n) { Array.new(1 << n, -1) }
 parent = Array.new(n) { Array.new(1 << n, -1) }

 puts
"\n--------------------------------------------------------------------------
-------------------------------------------------\n"
 puts "                                                    RUTE OPTIMAL
"
 puts
"--------------------------------------------------------------------------
-------------------------------------------------\n\n"
 puts "   Titik mulai: 1
"
 res = tsp(dist, 1, 0, n, dp, parent)
 puts "   Jarak minimum: #{res} m
"
 print "   Rute: 1 - "
 print_path(parent, 0, 1, n)
 puts "1    "
 puts
"\n--------------------------------------------------------------------------
-------------------------------------------------\n\n"
rescue Errno::ENOENT
 puts "FIle tidak ditemukan"
rescue => e
```

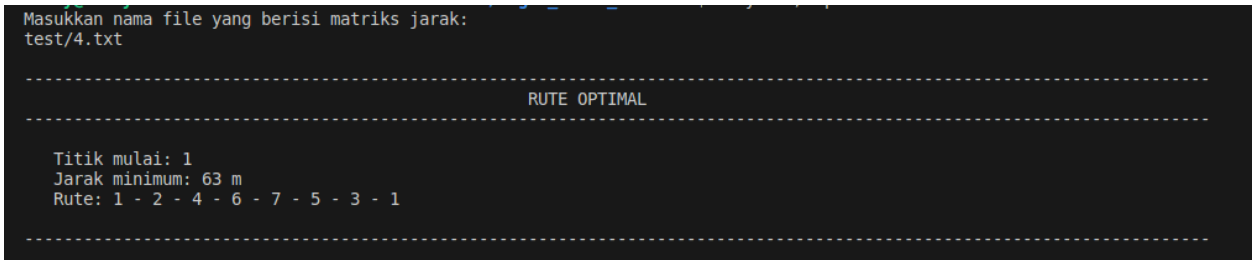
```
 puts "Error: #{e.message}"
end
```

Hasil Uji Program









Lampiran

https://github.com/randyver/Tugas_Bonus_13522067.git