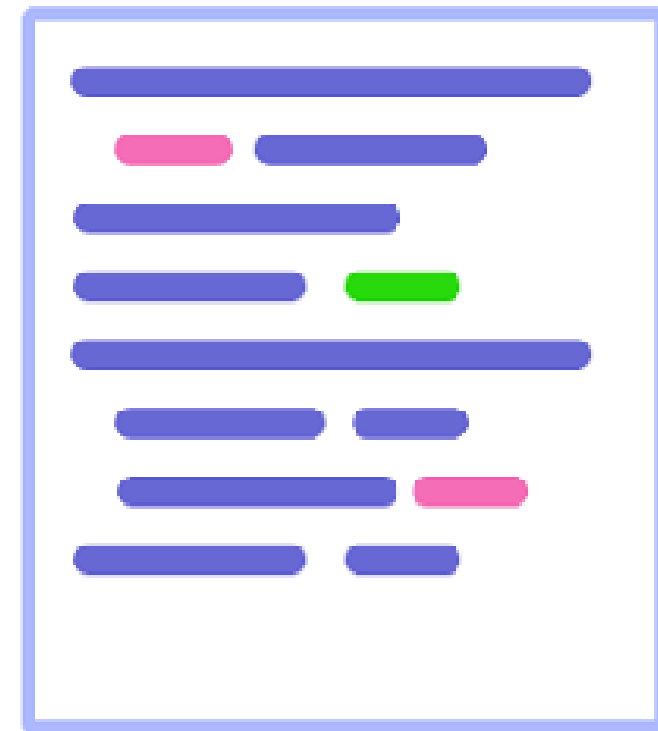
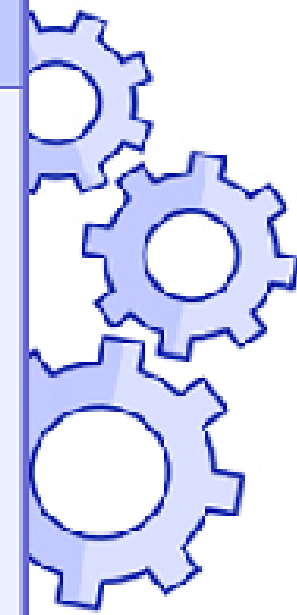
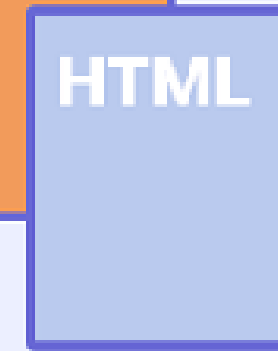
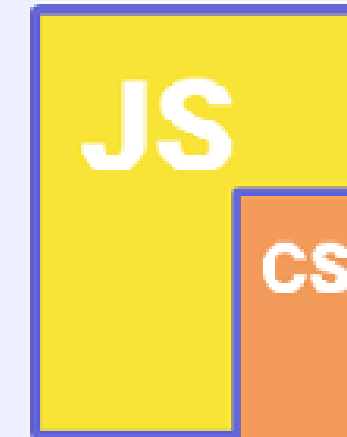


C++, C or Rust



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Web Assembly

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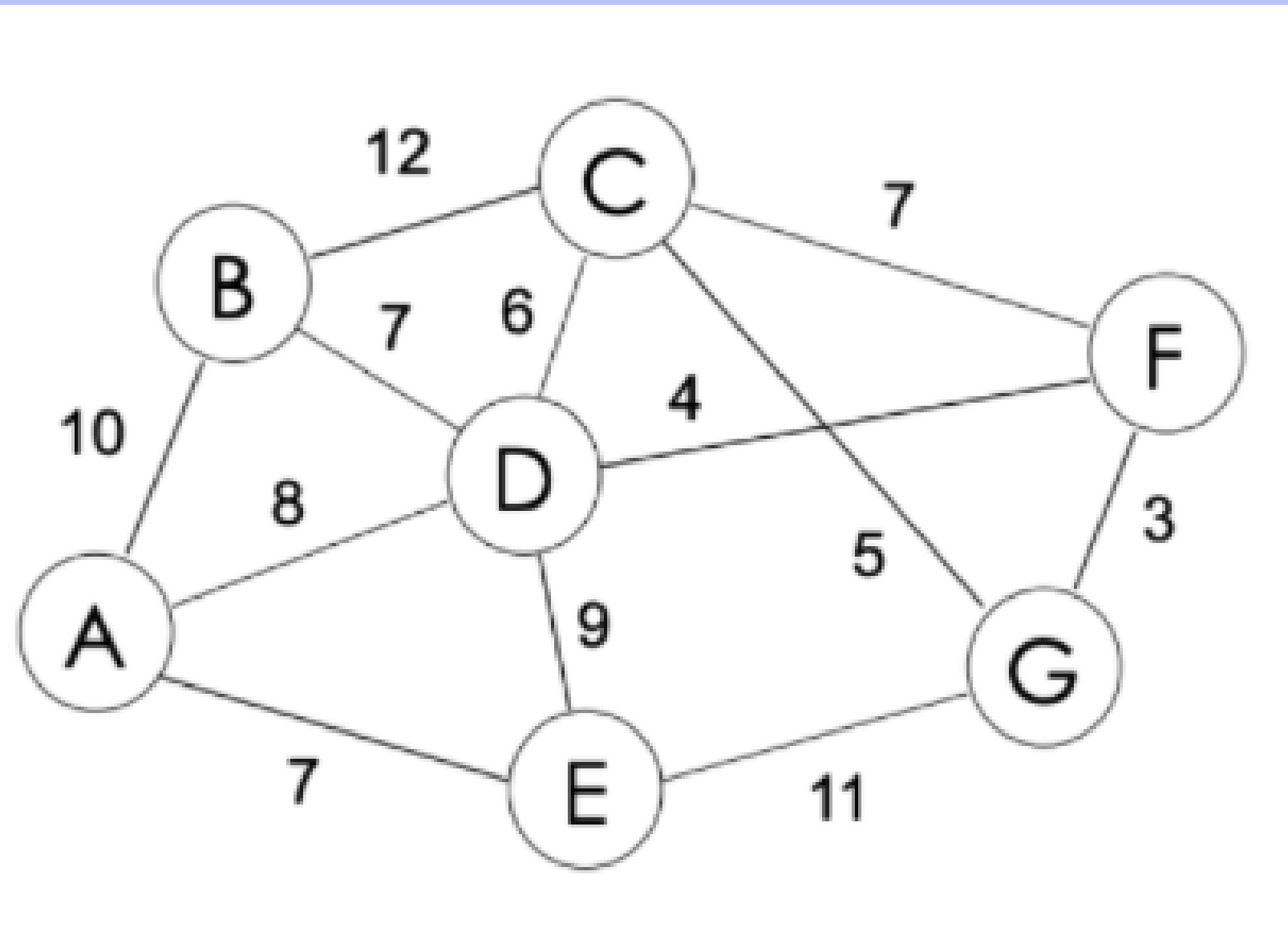
2. Demo

3. Código

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Tarea



Implementar un programa que encontrara la mejor ruta para un vendedor dado que tiene que visitar a todos sus clientes.

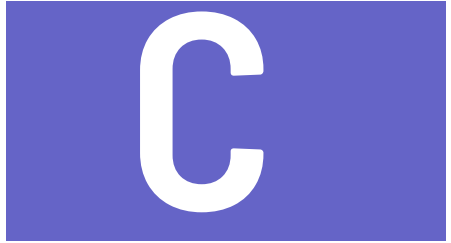
La figura muestra la ubicación de los clientes y las distancias asociadas a cada camino disponible.

El problema consiste en encontrar la secuencia óptima.

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Demo

Código



Función least

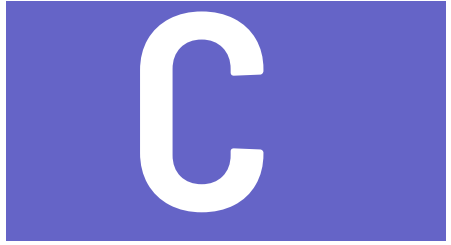
```
int ary[MAX][MAX],completed[MAX],n,cost;

int least(int c, int** ary)
{
    int i,nc=999;
    int min=999,kmin;

    for(i=0;i < n;i++)
    {
        if((ary[c][i]!=0)&&(completed[i]==0))
            if(ary[c][i]+ary[i][c] < min)
            {
                min=ary[i][0]+ary[c][i];
                kmin=ary[c][i];
                nc=i;
            }
    }

    if(min!=999)
        cost+=kmin;

    return nc;
}
```



Función mincost

```
void mincost(int city, int* memoria, int k, int** ary)
{
    int i, ncity;

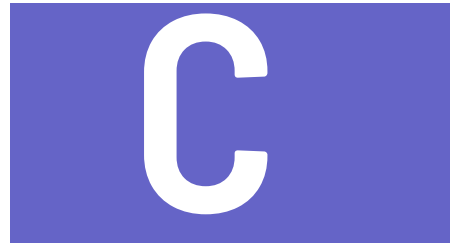
    completed[city]=1;

    printf("%d--->", city+1);
    memoria[k] = city+1;
    ncity = least(city, ary);

    if(ncity==999)
    {
        ncity=0;
        printf("%d", ncity+1);
        cost+=ary[city][ncity];

        return;
    }

    mincost(ncity, memoria, k+1, ary);
    memoria[0] = cost;
}
```



Función tsp

```
int tsp(int* memoria, int** ary, int dimension)
{
    cost = 0;
    n = dimension;
    int i;
    for(i=0;i < n;i++)
    {
        completed[i]=0;
    }

    printf("\n\nThe Path is:\n");
    mincost(0, memoria, 1,ary); //passing 0 because starting vertex

    printf("\n\nMinimum cost is %d\n ",cost);

    return 0;
}
```


Javascript

Función makePtrOfArray

```
const graph = [  
  [0, 4, 1, 3],  
  [4, 0, 2, 1],  
  [1, 2, 0, 5],  
  [3, 1, 5, 0],  
];
```

```
const makePtrOfArray = (myModule, N) => {  
  const arrayPtr = myModule._calloc(N, 4);  
  for (let i = 0; i < N; i++) {  
    let rowsPtr = myModule._calloc(N, 4);  
    myModule.setValue(arrayPtr + i * 4, rowsPtr, "i32");  
    for (let j = 0; j < N; j++) {  
      myModule.setValue(rowsPtr + j * 4, graph[i][j], "i32");  
    }  
  }  
  return arrayPtr;  
};
```

Javascript

Función getArrayFromPtr

```
const getArrayFromPtr = (myModule, ptr, N) => {  
  let resultMatrix = [];  
  for (let i = 0; i < N; i++) {  
    resultMatrix[i] = myModule.getValue(ptr + i * 4, "i32");  
  }  
  return resultMatrix;  
};
```

Javascript

Función cRunner

```
const cRunner = (Module, arrayPtr, G) => {  
  let startTime = window.performance.now();  
  let result = Module._tsp(arrayPtr, G, dim);  
  let endTime = window.performance.now();  
  console.log("result", result);  
  const resultTime = endTime - startTime;  
  return resultTime;  
};
```

Javascript

```
const calcBtn = document.getElementById("calc-btn");  
Module().then(function (mymod) {  
  calcBtn.onclick = () => {  
    const arrayPtr = mymod._calloc(dim, 4);  
    const G = makePtrOfArray(mymod, dim);  
    let cTime = cRunner(mymod, arrayPtr, G);  
    let matrix = getArrayFromPtr(mymod, arrayPtr, dimResult);  
    console.log(`cresult - ctime ${matrix} ${cTime}`);  
    addToTable(matrix, cTime);  
  };  
});
```

Javascript

Función addToTable

```
const addToTable = (resultArr, execTime) => {  
  const table = document.getElementById("result-table");  
  let row = table.insertRow(-1);  
  let cell1 = row.insertCell(0);  
  let cell2 = row.insertCell(1);  
  let cell3 = row.insertCell(2);  
  cell1.innerHTML = `${resultArr[0]}`;   
  cell2.innerHTML = `${resultArr.slice(1).join("->")}`;  
  cell3.innerHTML = `${execTime} ms`;  
};
```

Dificultades

- Tuvimos muchos errores al momento de programar por lo que nos fuimos quedando atascados error tras error.
- No logramos recibir el input desde HTML por lo que finalmente trabajamos con un grafo definido desde JS.

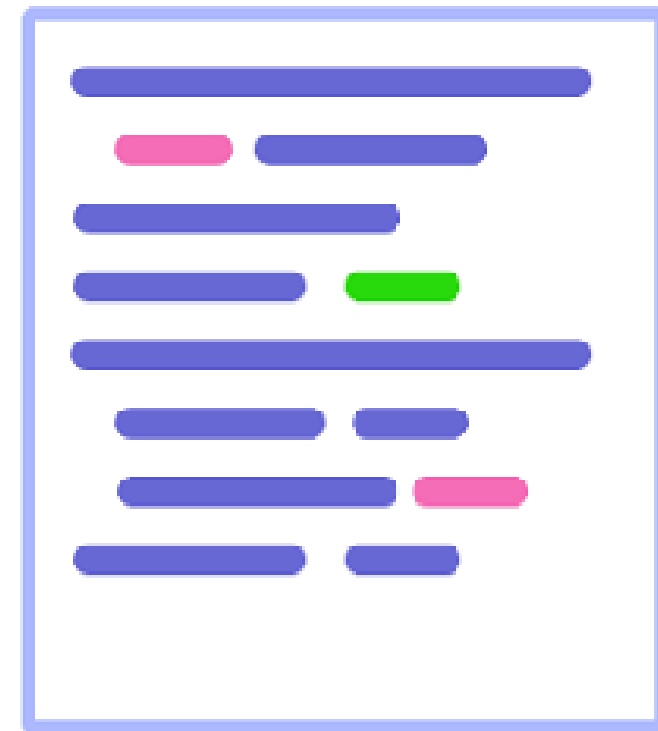


Aprendizajes

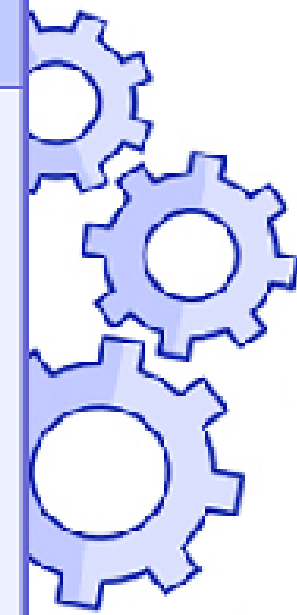
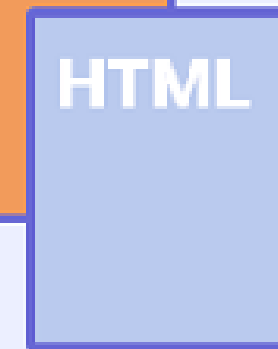
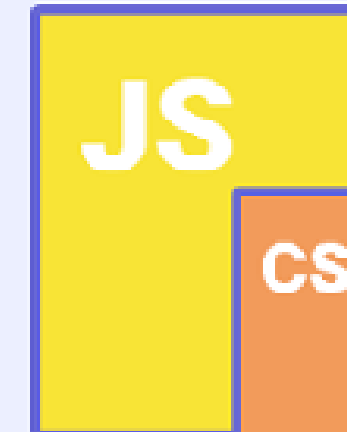
- Logramos comprender la base de Web Assembly, programar y ejecutar desde C



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Muchas gracias