Unions Solutions

Unions

- Briefly describe the C++ union
  - A union is an object which can store data of varying types
  - Implemented as a special kind of struct in which all the members are stored at the same address
  - Only one member can be in use at any one time

Union Example

- Write a simple program which creates a union and assigns one of its members
- What happens if the program accesses a different member?
  - A garbage value, probably
- Explain your results
  - Only one member in a union is in use at any one time
  - The other members have undefined values
  - Accessing a member which is not in use causes undefined behaviour

Tagged Union

- What is a "tagged" union?
  - A tagged union has an extra "tag" member
  - This tag indicates which member is in use
  - When the programmer uses a member, they should set the tag to indicate that this member is now in use
  - Before accessing a member, the programmer should check the tag to see if the member is in use

Tagged Union

- Why are tagged unions useful?
  - The programmer can avoid undefined behaviour with unions, by only accessing a member if it is in use
- Are there any drawbacks to tagged unions?
  - Requires the programmer to set and check the tag member correctly

Tagged Union Example

- Write a simple program which creates a tagged union and assigns one of its members
- What happens if the program accesses a different member?
  - If the programmer set the tag correctly when the assigned the member, they can check the tag before accessing a member
  - In that case, the tag will match the member which is in use
  - If the member the programmer wishes to access is not in use, the tag value will not match