Re: Compact connected Hausdorff

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* *From*: William Elliot <marsh@xxxxxxxxxxxxxxxxxx>
* *Date*: Mon, 5 Dec 2005 03:40:02 −0800

On Mon, 5 Dec 2005, Jannick Asmus wrote:
> On 05.12.2005 00:17, quasi wrote:
> > On Sun, 04 Dec 2005 23:59:04 +0100, Jannick Asmus
> > <jannick.news@xxxxxx> wrote:
> >
> > A component of U must be open in U (a component of any space is both
> > open and closed in that space).
>
> First, let me say that in this context 'component' means 'connected
> component' to me. Just to avoid confusion.
>
> Could you prove that a component is open *without* any additional
> assumption on U (e.g., U has only fintely many components or U is
> locally connected)?
>
Components of a open subset of a locally connected space are clopen.

If S is connected and locally connected, C a component of open U,
then cl C − U nonnul

Assume cl C − U = nulset.
Note as S is locally connected, so is U.
Show nonnul C = cl C proper subset U
Thus C is clopen within U and subsequently S.
But as S is connected, contradiction ensues.

However the lemma is
compact connect (Hausdorff) S, open nonnul U /= S
C (connected) component U ==> (cl C) − U nonnul

For continuums, ie compact connected Hausdorff, a companion lemma
Nonnul closed A proper subset continuum S, C component A
==> (bd A) /\ C nonnul

The proof of this however was no clue how to prove the other.
This companion lemma is used to show continuums have no
countable partition of closeds sets. The former is useful
to construct for a continuum, a network of continuums.

(Networks are like bases except instead of being a collection
of open sets, they can be a collection of any subsets.)

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- ***References***:
  - ***Compact connected Hausdorff***
    - *From:* William Elliot
  - ***Re: Compact connected Hausdorff***
    - *From:* quasi
  - ***Re: Compact connected Hausdorff***
    - *From:* Jannick Asmus
  - ***Re: Compact connected Hausdorff***
    - *From:* quasi
  - ***Re: Compact connected Hausdorff***
    - *From:* Jannick Asmus

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